



# Mental ability, Self-esteem and Learning Styles as Correlate of Creativity among High Achieving Secondary School Students in Oyo State.

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Creativity, a basic tool for innovation in any society, appears to have limited space in the curricula of secondary schools in Nigeria. School activities are generally oriented towards conformity to standards; this is inimical to creativity. There is a need for schools to promote, what can be called a 'growth of personality' by fostering the creative process in their methodology with the ultimate goal of teaching for creativity. Several studies have been carried out on creativity with a few of them focusing on correlates of creativity. This study, therefore, examines the extent to which mental ability, self-esteem and learning styles correlated with creativity among high-achieving public senior secondary school students in Oyo State, Nigeria. The descriptive survey research design was adopted. Systematic sampling and purposive sampling techniques were used in the selection of the schools and the participants respectively. The results revealed that mental ability, self-esteem and learning styles had multiple correlations with creativity among high-achieving senior secondary school students and jointly accounted for four percent in the variance of creativity. Therefore, it is recommended that governments at various levels, teachers, school administrators, counsellors, psychologists and parents should pay attention to these factors in order to enhance the creativity of the high-achieving students.

Keywords: Self-esteem, Learning styles, Creativity, High-achieving students



## Introduction

Creativity is a necessary condition for mastering as well as improving the quality of the environment, given the fact that traditional and stereotypical approaches to problem solving are grossly inadequate in the face of complex realities (Salaudeen (2014) Ref). Similarly, creative adaptation to environment appears to be humankind's ultimate asset in a world that witnesses phenomenal changes on regular basis (Nwazuoke, 1997). Given human's adaptability strategies, great developments and discoveries have been derived from their untiring efforts to improve on the quality of life in society. Globally, developments in all areas of live functioning have hinged upon human's ingenuity and ability to meet the exigencies of this dynamic world. Few individuals, however, are the architects of these advancements in all areas of human endeavors; they are the creative ones (Kauffman, 2014). Creativity is a basic tool for progress in any society (Sternberg, 2011). A society that is lacking in creativity will be backward and developmentally retarded both socially and technologically (Runco, and Albert, 2010; Sternberg, 2011).

Owing to the conditions of modern-day living, which are characterized by complexity, and interdependence, technological and communication advances and rising expectations, the call for increased levels of creativity cannot be overlooked (Oyundoyin, 2003). Dingledine (2003) described creative thinking as the highest form of mental function and creative production, the peak of human achievement and the very root of human progress. In opposition to this definition, generally, conditions appear to favour the reception of knowledge rather than self-expression, reproduction rather than production, re-recreation rather than original creation. Although it is now known that schools can do a great deal to promote growth of personality by fostering the creative process in their organization, in every branch of their curricula and in their methodologies, however, there is the question of whether the school system can.

The aim of any school must be to secure the full potentials of its students in both body and mind. In addition, given the school curriculum and programmes, another question could be whether school training can facilitate students to be dynamically useful, to ensure that these are used for the good of the community, and to give adequate preparation for everyday life in the world of work and leisure. The school system may not succeed in any one of these its aims unless a room is given to creativity.



The atmosphere of the current dispensation, in general, militates against the fostering of creativeness in children. The school system is one that places high premium on high academic ability which dominates our view of mental-abilities. Although high academic performance is the best thing that can ever happen to students, being creative should not be undermined as it provides solution to many other problems. This is a plus for the high-achieving children. However, justice has not been done to them if their education has taught them how to find the single best answer and succeed, but fails to teach them how to think creatively and come up with many alternative solutions to a problem.

On many occasions in most developing economies, the school system is designed such that teachers have to cope with large classes with adolescent students. Usually, these students constitute persons from different socio-cultural backgrounds, learning styles, mental ability level and self-esteem. In such circumstances, it is difficult to follow the interests and desires of each individual child. Usually, but generally, students with low self-esteem lack the courage for creative accomplishment; high-achieving students may also have low self-esteem which invariably will affect their creative and cognitive development. Such students, who may be endowed differently, are usually compelled to focus more on their studies and believe in their self-conviction that certain forces will never allow them to be productive or creative. Furthermore, in many classroom situations, teachers usually motivate their students to attain certain objectives such as high academic performance at the expense of creativity or other areas of giftedness. Therefore, if students with creative potentials are not adequately motivated, the potentials for creativity in them may be suppressed and go into oblivion.

High achievers, who are usually the very brilliant students, are prone towards developing the spirit of perfectionism. This makes them hold the belief that they need to be perfect and should never make a mistake. This inhibits development of creativity. Besides, when adolescent students perform well in school, they can begin to be pigeon-holed by parents, teachers and even their classmates as “the clever ones”. This will give an insight to the adolescents that their self-worth depends on their high academic attainment. All these prevailing circumstances impede creativity development among students, especially among our high achieving secondary school students. It is therefore incumbent on teachers to find effective strategies to foster creativity development among high-achieving students.



Using Oyo State as a case study, this work is aimed at determining the relatedness of mental ability, self-esteem and learning styles to the creative ability of high-achieving secondary school students; and find out the relative contribution of mental ability, self-esteem and learning styles to creativity of high-achieving secondary school students in Oyo State. This study will add to the growing body of literature. The findings of this study will help the parents to have a better understanding of the type of support needed by their high-achieving children for creative expression. Also, the study will enable the educational administrators to provide policy framework and curriculum designers to design the curriculum that would be sensitive to the differentials in personalities of students, as well as facilitate creativity development in the secondary schools.

## **Literature Review**

### **The Concept of Creativity**

The notion of creativity has been found to be ambiguous, somewhat nebulous vague and intangible; thus subjecting itself to varying perception by different scholars who have written on it. Torrance (1962), from the rational thinking perspective, defined creativity as the process of sensing gaps or disturbing missing elements, forming new hypotheses and communicating the results, possibly modifying and retesting the hypotheses. Mever (2005) revealed that Alfred whitehead coined the term “creativity” as the ultimate category of his metaphysical scheme.

Also, Clarke (2008) viewed creativity as a concept of health, naturalness, intensesness and development of unique potentials. While Runco and Albert (2010) explained that the word “creativity” was derived from Latin language “creo” meaning to “create, make”. The word “create” appeared in English as early as the 14th century, notably in Chaucer, to indicate divine creation. In Judeo-Christian tradition, creativity was the sole province of God; humans were not considered to have the ability to create something new except as an expression of God’s work (Niu & Sternberg, 2006).

The US National Advisory Committee on Creative and Cultural Education in Britain in Salaudeen (2014) described creativity as imaginative activity fashioned so as to produce outcomes that are both original and of value. Gardner in Craft (2000) described a framework for understanding creativity which involves ‘intelligence, domain and field.’ This view was originally expressed by Feldman, Csikszentmihalyi and Gardner in Craft (2000) who declared that the basic idea is that creativity comes from the interactions of three ‘nodes’- the individual (and their intelligence), the



domain and the wider field. Most people associate creativity with the fields of art and literature. In these fields, originality is considered to be a sufficient condition for creativity, while in other fields, both originality and appropriateness are necessary (Sullivan & Harper, 2009). Oyundoyin (2003) explained further that more often than not, creativity has been associated with the arts – painting, sculpture, literature and so on.

It is upon this premise that Maitra cited in Salaudeen (2014) negates with an assumption given her position that “we should not confuse creativity with talent.” Talent is a specific attitude in a specific area. For example, people may be good at music or dance or painting without being creative. Creativity involves talent, but talent is not creativity. Maitra expressed the feelings that creativity happens when various forces – be they environmental, motivational and psychological – interact to create something unique. Thus, given the multidimensional plausibility creativity may take, it is not necessarily limited to arts alone. Similarly, the US National Advisory Committee on Creative and Cultural Education in Britain in Salaudeen (2014) described creativity as imaginative activity fashioned so as to produce outcomes that are both original and of value. Siltala (2010) added that in business, originality is not enough. The idea must also be appropriate, useful and actionable. Gardner in Craft (2000) described a framework for understanding creativity which involves ‘intelligence, domain and field.’ This view was originally expressed by Feldman, Csikszentmihalyi and Gardner in Craft (2000) who declared that the basic idea is that creativity comes from the interactions of three ‘nodes’- the individual (and their intelligence), the domain and the wider field. The initial seven mental abilities put forward by Gardner in Craft (2000) are:

- (1) Linguistic Mental Ability: Facility with language Commented [T1]: The statement is from Sullivan and Harper, 2009 and that is why we referenced it.
- (2) Logical-Mathematical Mental Ability: Ability in logical, mathematical and scientific thinking.
- (3) Spatial Mental Ability: Facility with a maneuverable and operational mental model of the spatial world. Surgery, painting, sailors, engineering are all examples of professions involving spatial intelligence.
- (4) Musical Mental Ability: Facility with music and sound. Performers, composers, conductors, require this kind of intelligence.



- (5) Bodily-Kinesthetic Mental Ability: Ability in solving problems or creating products using the whole body, or parts of it. Athletes, crafts people and dancers, for example, all utilize bodily-kinesthetic intelligence.
- (6) Interpersonal Mental Ability: Ability to understand and relate to other people. Successful politicians, teachers and sales people, all have this kind of intelligence.
- (7) Intrapersonal Mental Ability: Capacity to understand oneself accurately and to apply that understanding effectively in life.
- (8) Naturalist Mental Ability: Capability and expertise in recognizing and classifying the flora and fauna of numerous species.

Students vary in terms of individual intellectual or academic ability. While some are low academic achievers, some others are either average or high achievers. In an information document of the California State Department of Education in Salaudeen (2014), the concept of high achievements is explained as pupils who consistently produce ideas and/or products of excellence’.

In another study, it was declared that creativity is not the same as mental ability, in the sense of intelligence quotient (IQ), as research from the 1970s and 1980s has shown (Craft, 2000). The studies also revealed that certain kinds of divergent thinking skills can be improved with practice and training. But perhaps the most useful breakthrough in understanding creativity is the idea of creativity as multiple mental-abilities. Craft (2000) put forward a pluralist theory of mind which aimed to recognize the different mental abilities and strengths of individuals. He called it the “theory of multiple mental-abilities”. He suggested that this is a new definition of what it means to be a human being. “Socrates said humans are rational animals, Gardner says that human beings are animals which have a range of mental abilities, which go beyond those of both other animals and also machines” (Craft, 2000).

Similarly, the self-esteem of an individual influences in a great way the individual’s performance on a given task. Every individual is unique and special in terms of appearance, skills, ability, talents and intelligence, etc. Self-esteem refers to the judgment a person makes about himself or herself. It is the recognition of one’s qualities and abilities including values, goals, talents, worth, physical make-up and purpose in life. One’s self-esteem acts like a catalyst for great achievements. An individual with high self-esteem responds confidently to challenges and problems and practices



positive thinking. Parents and educators know that students of any age who have high self-esteem are more likely to be creative and successful in school than are students who lack self-confidence and doubt their own abilities. Both at home and in school, all students need to feel good about themselves (Jones in Salaudeen, 2014).

Self-esteem is a key point to creativity and it is so much essential that its effect on creativity cannot be overlooked. A mind with a good self-esteem will have a good creative ability. High self-esteem gives you courage and belief in your ability to make things happen, which in itself is creativity. Self-expression (creativity) goes hand-in-hand with self-acceptance and all work together to bring out the good in you. A general check on the great men and the achievers of this millennium can be traced to their high self-esteem and in their ability to succeed. Thus, there is general agreement that success in life, in general, and in education, in particular is based on one's level of self-regulation, motivation, and creativity (Boekarts, Pintrich and Zeidner, 2000). These aspects of learning are the foundation for academic success and of survival in today's competitive world. Education cannot afford to ignore the relevance of these indispensable sources for actualizing the human potentials.

Learning styles refer to common ways that people learn. Everyone has a mix of learning styles. That is, everyone has a mixture of strengths and preferences. No one has exclusively one single style or preference. One's preferred learning styles guide the way one learns (Salaudeen et al, 2017). Some people may find that they have a dominant style of learning, with far less use of the other styles. Others may find that they use different styles in different circumstances. There is no right mix nor is one's style fixed. One can develop ability in less dominant styles, as well as further develop styles that one already uses well. Although it is unclear whether the ability to create can be enhanced, there is consensus that the disposition to create can be suppressed.

Creativity and discipline are not antithetical – creative individuals practice much and work hard – but extensive reliance on overly structured activities can thwart the impulse to create, with negative effects on students' well being. Students with high ability will perform better than others in activities that require design, imagination, or invention, but participation in such activities encourages the disposition to create in students at any level of ability. A learning style is the method of processing information peculiar to an individual that is presumed to allow that individual to



learn best. The idea of individualized learning styles originated in the 1970s. Since then, it has been proposed that teachers should assess the learning style of their students and adapt their classroom methods to best fit each student's learning styles (Colfied, Moseley, Hall and Ecclestone, 2004).

### **Mental ability and Creativity of High-achieving Students**

Mental ability is concerned with the processes of understanding, storing and reproducing information. It involves identification, classification, concrete and abstract thinking. These have been intensively studied in the psychological areas (Okpala in Salaudeen, 2014). Generally, students vary in terms of individual intellectual or academic ability. While some are low academic achievers, some others are either average or high achievers. In an information document of the California State Department of Education in Salaudeen (2014), the concept of high achievements is explained as 'students who consistently produce ideas and/or products of excellence'. In another study, it was declared that creativity is not the same as mental ability, in the sense of intelligence quotient (IQ), as research from the 1970s and 1980s has shown (Craft, 2000). These studies also revealed that certain kinds of divergent thinking skills can be improved with practice and training. Perhaps, the most useful breakthrough in understanding creativity is the idea of creativity as multiple mental-abilities. Craft (2000), in his pluralist theory of mind, recognised the different mental-abilities and strengths of individuals. He called it the "theory of multiple mental-abilities". He suggested that this is a new definition of what it means to be a human being. This notion is synonymous with Socrates' perception that human beings are rational animals. Gardner also posits that human beings are animals who have a range of mental abilities (Craft, 2000).

In explaining the concept of creativity, the initial seven mental abilities put forward by Gardner in Craft (2000) are:

- (1) Linguistic Mental Ability: Facility with language
- (2) Logical-Mathematical Mental Ability: Ability in logical, mathematical and scientific thinking.
- (3) Spatial Mental Ability: Facility with forming a maneuverable and operational mental model of the spatial world. Surgery, painting, sailors, engineering are all examples of professions involving spatial intelligence.
- (4) Musical Mental Ability: Facility with music and sound. Performers, composers, conductors, require this kind of intelligence.

- (5) Bodily-Kinesthetic Mental Ability: Ability in solving problems or creating products using the whole body, or parts of it. Athletes, crafts people and dancers, for example, all utilize bodily-kinesthetic intelligence.
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- (7) Intrapersonal Mental Ability: Capacity to understand oneself accurately and to apply that understanding effectively in life.
- (8) Naturalist Mental Ability: Capability and expertise in recognizing and classifying the flora and fauna of numerous species.

Oyundoyin (2003) reported that the cognitive factor significantly predicts creativity. It was noted that the total variance accounted for by mental ability is 8% (i.e.  $R^2 = 0.080$ ). This implies that mental ability is important when considering factors that influence creativity. The most detailed and methodologically satisfying attempt to obtain a reliable overall assessment of children's creativity and the extent to which it is distinguishable from mental ability came from Wallach and Kogan (1965). They adopted the Getzels and Jackson method of forming contrasting groups of children (10-11 years old) high in creative ability and low in mental ability and vice-versa. They divided their large sample into four groups. The high creativity-high mental ability children could exercise both control and freedom. The high creativity-low mental ability children were in angry conflict with them and beset by feelings of inadequacy. Yet, in a stress-free environment, they could fulfill themselves with understanding. The "Low Creativity-High Mental ability" group was found to be addicted to school achievement which was their main goal and interest in life. The "Low Creativity-Low Mental ability" groups were apprehensive. Wallach and Kogan concluded, not unreasonably, that a dimension of intellectual ability existed which was independent of general intellectual ability, and was appropriately called "creativity" – a mode of perception-functioning which matters a great deal in the life of every individual.

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### **Self-Esteem of the High-achieving Students**

Just like mental abilities, the self-esteem of an individual has been identified to influence individual's performance on a given task. Every individual is unique and special in terms of appearance, skills, ability, talents and intelligence; however, a personal assessment of oneself determines output. Basically, self-esteem refers to the judgment a person makes about himself or herself. Also, it is the recognition of one's qualities and abilities including values, goals, talents, worth, physical make-up and purpose in life. Hence, one's self-esteem acts like a catalyst for great achievements. It is believed that an individual with high self-esteem responds confidently to challenges and problems and practices positive thinking (Jones in Salaudeen, 2014).

In view of these self-esteem attributes, parents and educators are of the opinion that students of any age who have high self-esteem are more likely to be creative and successful in school than other students who lack self-confidence and doubt their own abilities (Jones in Salaudeen, 2014). Self-expression (creativity) goes hand in hand with self-acceptance and all work together to bring out the good in you. A general check on the great men and the achievers of this millennium can be traced to their high self-esteem and in their ability to succeed. Thus, there is general agreement that success in life, in general, and in education, in particular, is based on one's level of self-regulation, motivation, and creativity (Boekarts, Pintrich and Zeidner, 2000).

These aspects of learning are the foundation for academic success and survival in today's competitive world. Education cannot afford to ignore the relevance of these indispensable sources for actualizing the human potentials. Research conducted on the effects of self-esteem on education level has shown that those with a higher level of self-concept tend to do better in school and receive more education. There have been many studies done on the correlation between self-esteem and education. Various studies have shown that people with low self-esteem try to avoid exposing their unfavourable characteristics. In order to do this, they avoid anything that may risk revealing their flaws. Due to this, they are less daring as they do not take on any challenges that may bring rewards, such as furthering their education (Wood et al., 1994). Loeb and Jay in Salaudeen (2014), in an attempt to provide some clearly differentiated measures of self-esteem



with gifted children and to look at gender as a variable, conducted a study using a multi-method approach. Their results showed that the teachers and mothers of gifted students generally rated them as having fewer problems in almost all areas than did the teachers and mothers of the control students. They also found that girls differ from boys in their perceptions of themselves as gifted. Girls were more likely to find achievement through conformity, as demanded in elementary school, congruent with a positive self-image and feelings of control over lives. Boys, however, define their ideal male as aggressive, self-reliant and individualistic, a pattern that does not seem to fit well into this conformity learning pattern.

Olukotun in Salaudeen (2014), in his study of the social skills and self-statement strategy as treatment techniques for enhancing self-concept of the visually handicapped persons, observed that there is a significant difference between the performance of both the treated subjects in the experimental groups and those that were not treated.

### **Learning Styles and Creativity of the High-achieving Students**

Beyond the issues of mental abilities and self esteem is the concept of learning style. Learning styles refer to common ways that people learn. Everyone has a mix of learning styles. That is, everyone has a mixture of delivery, strengths and preferences. No one has exclusively one single style or preference. One's preferred learning styles guide the way one learns (Salaudeen, G. Aikomo, D, Jiboye T. & Adejumo, O., 2017). Some people may find that they have a dominant style of learning, with far less use of the other styles. Others may find that they use different styles in different circumstances. There is no right mix nor is one's style fixed. One can develop ability in less dominant styles as well as further develop styles that you already use well. A learning style is the method of processing information peculiar to an individual that is presumed to allow that individual to learn best. The idea of individualized learning styles originated in the 1970s. Since then, it has been proposed that teachers should assess the learning styles of their students and adapt their classroom methods to best fit each student's learning styles (Colfield, Moseley, Hall and Ecclestone, 2004).

Learning styles is one of the most widely used terms in relation to student learning (Fry, Ketteridge & Marshall, 2009). There are several categorizations of 'styles'; research-based evidence of their existence is sparse (Coffield, Mosseley, Hall & Ecclestone, 2004). The term is sometimes misused



to mean approaches to learning, or the two are conflated. However, learners may have preferences; it may be that they should be encouraged to use a range of learning styles, in which case, those responsible for organizing learning should create opportunities for learning that are sensitive to different styles, and do not simply reflect how they or their students like to learn (Fry, Ketteridge & Marshall, 2009).

Learning styles (also referred to as cognitive styles) are the different ways in which people process information in the course of learning. They include individual preferences in both perceptual organization and conceptual categorization, that is, perceiving, thinking, remembering and solving problems (Ausubel in Salaudeen, 2014). In addition, Ausubel believed that learning styles are a reflection of individual differences in personality and motivation. In view of the foregoing, The gap this study will fill is to provide school management and teachers the fundamental knowledge of the kind of school environment and strategies that could help in creative expression among high-achieving secondary school students.

### **Methodology**

The following hypotheses were tested in the study at 0.05 levels of significance:

**Hypothesis I:** There is no significant joint contribution of the independent variables to creativity of high-achieving secondary school students.

**Hypothesis II:** There is no significant relative contribution of the independent variables (Mental ability, self esteem and learning styles) to creativity of high-achieving secondary school students.

Hypothesis III: There is no significant relationship between the independent variables (Mental ability, self-esteem and learning styles) and creativity of high-achieving secondary school students.

The population of this study comprised all high-achieving class one students of Senior Secondary Schools (SSS1) in Oyo State, Nigeria. The sample for this study consisted of six hundred (600) high academic ability senior secondary school students from public schools in Oyo State with the aid of structured questionnaire and conduct of test for the selected students. The total sample size of the schools that participated in the study was 40 secondary schools. The total number of all the public secondary schools in Oyo State was collected. The list of all these schools was also collected. As at the time of carrying out this study, there were 987 secondary schools in Oyo state.



The researcher thereafter used systematic sampling technique to identify the schools that participated in the study, e.g. by picking every 23rd school on the list of public secondary schools in Oyo State. Senior secondary school class one students of each school involved participated in the study. The students' academic records were collected. Their results from Junior Secondary Schools one to three (JSS1-3) were consulted and the mean scores of each of the participants were calculated. Only those with mean scores of sixty (60) and above were selected to participate in the study. Thereafter, fifteen (15) best students in senior secondary school class one of each of the schools involved were selected as participants for the study.

For the purpose of this study, the following test instruments were used:

- Slossons Intelligence Test (SIT): For measuring mental ability of the testees.
- Ibadan Creativity Assessment Scale (ICAS): For measuring creative ability of the testees.
- Learning Style Assessment Scale (LSAS): This was to determine the learning style considered best to the individual respondents (that is, the learning style through which an individual learns best).
- Rosenberg Self-Esteem Scale (RSES): This was to assess the self-esteem of the individual participants in the study.
- Students' Academic Records: This was to determine their academic achievement level.

### **Method of Data Analysis**

This study adopted the ex-post facto research design of correlation type. In such a design, the researcher did not control the independent variables because they have already occurred. The data collected were analyzed using inferential statistics of multiple regressions. All the hypotheses were tested at 0.05 level of significance. Pearson Product Moment Correlation was employed to determine the relationship between the independent and dependent variables.

Correlation matrix was employed to answer the research questions.

## Results

Table 1: Multiple regressions: joint contribution of mental ability, self esteem & learning styles to creativity

| Model      | Sum of Squares | Df  | Mean of Square | F     | Sig. |
|------------|----------------|-----|----------------|-------|------|
| Regression | 155393.21      | 3   | 51797.738      | 8.862 | .000 |
| Residual   | 3378247.6      | 578 | 5844.719       |       |      |
| Total      | 3533640.8      | 581 |                |       |      |

*Source: Author's Computation*

$R = .210$        $R^2 = .044$        $Adj R^2 = .039$

The table above (Table 1) showed that the joint contribution of the independent variables (mental ability, self-esteem and learning styles) to creativity of high-achieving students was significant [F (3, 578) = 8.862,  $P < .05$ ],  $R = .210$ ,  $R^2 = .044$ ,  $Adj. R^2 = .039$ ,  $P < .05$ . Four percent (4%) of the variation was accounted for by the independent variables. This means that all the independent variables jointly contributed significantly to creativity of the participants.

Table 2: Multiple regressions: relative contribution of mental-ability, self-esteem & learning-styles to creativity  $\beta$

| Model          | Unstandardized Coefficient |            | Standardized Coefficient | T      | Sig. |
|----------------|----------------------------|------------|--------------------------|--------|------|
|                | $\beta$                    | Std. Error |                          |        |      |
| Constant       |                            | 83.766     |                          | 4.944  | .000 |
| Mental Ability | -1.172                     | .677       | -.071                    | -1.731 | .084 |
| Self Esteem    | -.629                      | .740       | -.036                    | -.851  | .395 |
| Learning Style | 1.400                      | .281       | .211                     | 4.976  | .000 |

*Source: Author's Computation*

The table above (Table 2) showed the relative contribution of each of the independent variables (mental ability, self-esteem & learning styles) to creativity of high-achieving secondary school students. Mental ability ( $\beta = -.071$ ,  $P > .05$ ), self-esteem ( $\beta = -.036$ ,  $P > .05$ ) and learning styles ( $\beta = .211$ ,  $P < .05$ ). This result thus showed that while learning styles was significant to creativity, mental

ability and self-esteem were not. This means that mental ability and self-esteem did not make significant relative contribution to creativity while learning styles did.

**Table 3: Correlation matrix: relationship between creativity and mental-ability, self-esteem and learning-styles**

|                 | Mean     | Std. Dev | Creativity | Mental Ability | Self-Esteem | Learning Styles |
|-----------------|----------|----------|------------|----------------|-------------|-----------------|
| Creativity      | 324.7371 | 77.9872  | 1          |                | 1           |                 |
| Mental Ability  | 121.2388 | 4.7039   | -.052      | 1              |             | .093*           |
| Self-Esteem     | 26.8505  | 4.4420   | .018       | .05            |             | .261**          |
| Learning Styles | 49.7045  | 11.7279  | .195**     | .015           |             | 1               |

**Source: Author's Computation**

\*\* Sig. at .01 level \* Sig. at .05 level

Results in the table above (Table 3) showed that there was a significant correlation between creativity and learning-styles but none between creativity and mental ability and between creativity and self-esteem.

Hypotheses 1, 2 and 3 were designed to capture the overall result of the relationship between the independent variables and the dependent variable. The overall result shows that there was no significant relationship between mental-ability and self-esteem and creativity while there was significant correlation between learning styles and creativity. This was evident in the analysis presented in Tables 1, 2 and 3.

### **Discussion of Findings**

The result in Table 1 showed that the joint contribution of the independent variables was significant. This is an indication that all the three independent variables (mental ability, self-esteem and learning styles) have jointly contributed to the creative ability of the participants. This result is in line with “the threshold hypothesis” proposed by Torrance, which holds that a high degree of intelligence appears to be a necessary but not sufficient condition for high creativity. According to Mackinon (1962), a higher mental ability caused little difference in creative ability. He concluded that the highly creative men and women he studied could not be distinguished from their contemporaries by their scores in intelligence tests. Riding and Sadler-Smith (1997) also reported



that types of instructional material treatment such as abstract or pictorial presentation and learning styles have very important influence among secondary school or college students; Grey (2000-2001) also revealed that if there is a connection between self-esteem and creativity, it is a mental one.

The result in Table 2 showed that learning styles significantly contribute to the creative ability of the participants while mental ability and self-esteem did not. This result corroborates the finding of Diaz and Cartnal (1999) that students in the distance learning class who possessed a more independent and conceptual style had the highest average scores in all the student achievement areas. People with the lowest scores in student achievement in the distance learning course had a more social and conceptual styles. Students with both social and conceptual learning style performed much better in the on-campus class. The outcome of this study suggested that successful distance education students favoured an independent learning environment. Successful on-campus students showed a preference for working with others. This result underscores the significance of learning styles in student achievement. This result also lend credence to the studies by Mackinon (1967), Getzels and Jackson (1962), Torrance (1962) on low correlation between creativity and mental ability. Trother (1971) who also reported lower self-esteem among the high ability individuals than their more typical peers and that of Woolfolk (2007) on the significance of preferred learning style.

Result in Table 3 showed that mental ability and self-esteem have no relationship with creativity of high-achieving students while learning styles have. The implication of this is that when creativity is taught according to a learner's preference, instinct for creativity can be motivated. This supports the study of Torrance (1982) that found relationships between the Human Information Processing (HIP) (1984), a measure of an individual's problem solving style by left brain, right brain, interpreted or mixed and the Gregore Style Delineator held significant positive correlations with the left hemisphere scale ( $r = .49$  and  $.67$ ) and correlated negatively with the Right Hemisphere Scale. The findings indicate that sequential ordering was associated with the left hemisphere creative style and that random ordering was associated with the right hemisphere creative style. Other scholars in agricultural education have also concluded that learning styles affect student learning (Friedel and Rudd, 2006). The result also supports the earlier findings of Trefinger and Renzulli (1986) which stated that IQ scores emphasize school house giftedness rather than



creative, productive giftedness. The concept of Intelligence Trap could be used to explain the reason for this result. According to Akinboye (2001), the Intelligence Trap hypothesis asserts that highly intelligent people may not be creative because they had been trapped into the general complacent feelings that high intelligence automatically means high performance. Somebody with lower IQ may be more creative than another with higher IQ. Trother (1971) also reported that high-achieving individuals often have a lower self-concept than their more typical peers. This is so because high-achieving individuals do set high standard for themselves, and so will not be satisfied with their present performance. This results in low self-esteem among them.

The result in Table 2 showed that there was significant relationship between ideative flexibility and learning styles while there was no relationship between ideative flexibility and mental ability and self-esteem. This is in line with the findings of Atkinson (2003b) who declared that there was a clear relationship between achievement, being creative and certain cognitive style groupings, and Akinboye (2001) who reported that the Mental ability Trap hypothesis asserts that people with high mental ability may not be creative because they had been trapped into the general complacent feelings that high mental ability automatically means high performance. Thus, a measure of one cannot be expected to serve as a measure of the other. This result also agreed with that of Trother (1971) who revealed that high ability individuals often have lower self-concepts.

The result in Table 3 revealed that there was significant relationship between ideative originality and learning styles. However, there was no such relationship between ideative originality and mental ability and between ideative originality and self-esteem. This result could be interpreted to mean that learning styles correlate perfectly with creativity. This is a reflection of the studies by Wittig (1985) and McEwen (1986) who studied relationships between learning styles and various measures of divergent thinking and feeling. The results showed that students with different learning styles expressed their creativity in varying ways. The report also supported the study by Torrance (1987) which holds that a high degree of mental ability appears to be a necessary but not sufficient condition for high creativity. That is, while there is a positive correlation between creativity and mental ability, this correlation disappears for IQs above a threshold of around 120. This is also in line with Trother (1971) who reported that gifted individuals often have lower self-concepts.

### **Conclusion and Recommendations**

Knowledge is not an automatic endowment; it is gained through learning experiences. Creativity is an important product of knowledge. Its importance is underscored when it is described as a basic tool for progress in any society. Thus, it is universally believed that any serious nation should place high priority on high creative development of her citizenry. The National policy on education of the Federal government of Nigeria provides for high-ability students to develop maximally so that our nation can develop both socio-economically, politically and technologically. This cannot be achieved if the citizenry are bereft of creativity.

This study is an attempt to look inwards by starting from the grassroots through secondary education how creativity can be effectively developed. Three important factors (the independent variables – mental ability, self-esteem, and learning styles) were considered to verify their relationship to creativity. The study revealed that high mental ability is necessary for creativity but without one-to-one correlation between high mental ability and creativity. The study also revealed that high-achieving students usually have low self-esteem and that learning styles are important to creative development of the high-achieving secondary school students. The study therefore recommends the following:

- Teachers should pay adequate attention to all high-achieving students for the purpose of fostering creative potentials in them. The findings of this study have revealed that teachers, guidance counselors, parents and government now know that high mental ability does not necessarily translate to high creative ability.
- It is also important that teachers should focus attention on the self-esteem of the students. Since it has been observed that high-achieving students may also have low self-esteem, teachers need to intervene to help them boost their self-esteem to enhance productivity. Learning styles have been found to be of significance among high-achieving students. This justifies the need to place more attention on the learning styles of the individual students. When learning is presented according to the individuals learning preference, high achievement is recorded or realized.
- Teachers should also endeavour to embark on regular assessment of their students. This will enable them identify their areas of needs.



- School heads, including the principal, the vice principal and all other heads of departments should collaborate and cooperate with the teachers of the high-achieving students in implementing the guiding principles that can facilitate creative development.
- Curriculum planners should consciously build the use of appropriate learning strategies into the planning and development of secondary school curriculum. This should be built into the modification of content, process, product and learning environment.

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