



# PERSONALITY TRAITS AS PREDICTOR OF CRITICAL THINKING ABILITY AMONG UNDERGRADUATE STUDENTS OF UNIVERSITY OF PORT HARCOURT

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## ABSTRACT

*This study investigated on personality traits as predictor of critical thinking ability among undergraduate students of University of Port Harcourt. Six research questions and six corresponding null hypothesis guided the study, with correlational research design utilized for the study. A sample size of 400 students drawn using simple random and proportionate stratified random sampling were used for the study. Two instruments, namely Cornell Critical Thinking Test Level Z (CCTZ) and the Goldberg's Big Five Inventory (GBFI). Split half technique of internal consistency yielded values of 0.581 for the CCTZ and 0.949 for the GBFI. The findings of this study shows that openness to openness personality traits has the highest prediction of critical thinking among the students and neuroticism personality has the lowest prediction of critical thinking among 300 level students. One the basis of the result obtained, it was recommended that teachers should embrace the teacher-student relationship in classroom and involve students during the teaching and learning process.*

**KEYWORDS:** *Personality traits, critical thinking, undergraduates, regression.*

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## INTRODUCTION

Interest in the concept of critical thinking has received considerable boost, especially in the 21<sup>st</sup> century. As such, various definitions of the concept has been offered. However, the definition of Scriven and Paul (1996) as intellectually disciplined process of actively, skillfully conceptualizing, applying, analyzing, synthesizing and evaluating information gathered through observation and experience, reflection, reasoning or communication as a guide to belief, and actions will serve as the basis for further discussion in this study. Encarta cited in Adeyemi (2012) defined critical thinking as a “disciplined intellectual criticism that combines research, knowledge of

historical context and balanced judgment. A person who thinks critically, does not accept information at face value. Rather, the individual evaluates such information systematically which informs their decision making ability. In other words, critical thinking is the purposeful and reflective judgment about what to believe or what to do in response to observation, experience, verbal or written expressions or arguments. Thus, critical thinking involves determining the meaning and significance of what is observed, expressed, or concerning a given inference or argument.

While the role of critical thinking in the development of individuals and societies has informed educational practice globally, in Nigeria,



our learning environment have been faulted as a bane of critical thinking and problem-solving skills (Mgboro, 2006) even when it is obvious that 21st century learners cannot attain excellence with these skills. Ejide (2006) had noted that most teachers, especially the novices, come to school regarding themselves as compendium of knowledge and consequently strive to impose what they think they know on 'passive' learners whose minds are considered as *tabula rasa*, thereby overemphasizing content without creating opportunities for discovery learning and creativity. Ejide further lamented that most Nigerian classrooms hardly reflect the interactive nature of teaching and learning rendering students passive recipients of poorly understood information with the concomitant effect of maximizing boredom and drudgery.

Based on this fact that education is a major driver of change and revolution in every society, appropriate education can be effective in producing educational innovations and optimal educational achievement. On the other hand, inappropriate educational methods inhibit academic excellence, block active and critical thinking (Sane, 2010). As such, there is need for the integration of critical thinking in the educational system of Nigeria.

Generally, theorists and thinkers of training issues refer that critical thinking consists of three parts including analysis, evaluation, and inference (Pawl, 1993). Improvement of critical thinking skills among students' especially undergraduate students is considered a central goal of high educational in both developed and developing countries (Facione, 2010). In order to achieve this goal, researchers and practitioners in the field of higher education have developed policies to address the integration of critical thinking in students' curriculum.

While deliberate effort has been made to integrate critical thinking into the school curriculum, it is an established fact that not all students display equal level of various traits including critical thinking. Common experience shows that some people are courageous while others are docile. While some are tenacious, others are wavering; while some are trustworthy, others are unreliable. Same applies to critical thinking as all humans, including students, do not exhibit equal level of critical thinking. Critical thinking dispositions, therefore, represent the affective dimension of thinking and shape one's routine ways of thinking in response to life events, contexts, and circumstances. Some theorists in the field of

education suggested that individual differences and personality traits lead to differences in the critical thinking skills (Mania & Elnaz, 2013). Based on this it is necessary to study the impact of personality traits on critical thinking skills between students, especially undergraduate students. The Big-five personality traits have emerged as a robust and parsimonious model for understanding the relationship between personality and various academic behaviors. Personality refers to internal factors such as dispositions and interpersonal strategies that explain individual behaviors and the unique and relatively stable patterns of behaviors, thoughts and emotions shown by individuals (Poropat, 2009). Orluwene (2012) defined personality as distinct characteristics such as intelligence, interest, attitudes and feeling of an individual in a variety of circumstance in a difficult situation. While various theorist have developed taxonomy of personality classification, many psychologists reached the agreement that a five-factor model, referred to as the "Big Five" personality theory is the most robust taxonomy. The following are the five components of the Big Five personality theory:

The *extraversion* dimension captures one's comfort level with relationships. Extraverts tend to be gregarious, assertive, and sociable. Introverts tend to be reserved, timid, and quiet. The *agreeableness* dimension refers to an individual's propensity to defer to others. Highly agreeable people are cooperative, warm, and trusting. People who score low on agreeableness are cold, disagreeable, and antagonistic. The *conscientiousness* dimension is a measure of reliability. A highly conscientious person is responsible, organized, dependable, and persistent. Those who score low on this dimension are easily distracted, disorganized, and unreliable, but conscientiousness dimension can be characterized by reliability, achievement-oriented, and orderly. The emotional stability dimension often labeled by its converse *neuroticism*-taps a person's ability to withstand stress. People with positive emotional stability tend to be calm, self-confident, and secure. Those with high negative scores tend to be nervous, anxious, depressed, and insecure. The *openness to experience* dimension addresses one's range of interests and fascination with novelty. Extremely open people are creative, curious, and artistically sensitive. Those at the other end of the openness category are conventional and find comfort in the familiar.



## STATEMENT OF THE PROBLEM

The current rapid developments and changes occurring in the information age in which we live and the accumulation of knowledge is rapidly increasing. Scientific and technological developments are increasing the need for a qualified workforce. This situation today makes it necessary for people to know themselves well, to be aware of their rights and responsibilities, to give importance to individual and social development, to be sensitive, thoughtful, inquisitive to research and make intelligent decisions, and to have critical thinking skills. The need for critical thinking is increasing but the question that is left unanswered is how do individuals in their unique personalities and perception towards everyday events will be able to think critically and logically in same goal. It has been observed by the researcher that most undergraduate students depends solely on the lecturers for knowledge during the teaching and learning process and this has limited their ability to think critically as they have are passively involved during the teaching and learning process.. This has become mind bugging to the researcher that if students in the classroom cannot be critical enough then what becomes of them in life outside classroom. It could also be observed too by the researcher that while some students lag behind in critical thinking, others do not hence the problem of this study is do personality traits predict critical thinking among undergraduate students of University of Port Harcourt?

## AIM AND OBJECTIVES OF THE STUDY

The aim of this study is to investigate the personality traits as predictors of critical thinking among undergraduate students of University of Port Harcourt. Specifically, the objectives of this study are as follows:

1. To determine the extent to which extraversion predicts critical thinking among undergraduate students of University of Port Harcourt.
2. To examine the extent to which students' openness to experience predicts critical thinking among undergraduate students of University of Port Harcourt.
3. To investigate the level to which agreeableness predicts critical thinking among undergraduate students of University of Port Harcourt.
4. To determine the level to which neuroticism predicts critical thinking

among undergraduate students of University of Port Harcourt.

5. To investigate the level to which conscientiousness predicts critical thinking among undergraduate students of University of Port Harcourt.
6. To examine the extent to which extraversion, openness to experience, agreeableness, neuroticism and conscientiousness jointly predict critical thinking among undergraduate students of University of Port Harcourt.

## RESEARCH QUESTIONS

From the objectives of this study, six research questions were developed to guide the study:

1. To what extent does extraversion predicts critical thinking among undergraduate students of University of Port Harcourt?
2. How does openness to experience predict critical thinking among undergraduate students of University of Port Harcourt?
3. To what extent does agreeableness predicts critical thinking among undergraduate students of University of Port Harcourt?
4. What is the predictive power of neuroticism predict critical thinking among undergraduate students of University of Port Harcourt?
5. To what extent does conscientiousness predict critical thinking among undergraduate students of University of Port Harcourt?
6. To what extent does extraversion, openness to experience, agreeableness, neuroticism and conscientiousness jointly predicts critical thinking among undergraduate students of University of Port Harcourt?

## HYPOTHESES

The following null hypotheses was tested at 0.05 level of significance have been postulated to guide this study.

1. Extraversion does not significantly predict critical thinking among undergraduate students of University of Port Harcourt.
2. Openness to experience does not significantly predict critical thinking among undergraduate students of University of Port Harcourt.
3. Agreeableness does not significantly predict critical thinking among



- undergraduate students of University of Port Harcourt.
4. Neuroticism does not significantly predict critical thinking among undergraduate students of University of Port Harcourt.
  5. Conscientiousness does not significantly predict critical thinking among undergraduate students of University of Port Harcourt.
  6. Extraversion, openness to experience, agreeableness, neuroticism and conscientiousness do not jointly predict critical thinking among undergraduate students of University of Port Harcourt significantly.

## LITERATURE REVIEW

**Critical Thinking:** Semil (2006) defined critical thinking as a logical reasoning and ability to separate facts from opinion, examine information critically with evidence before accepting or rejecting ideas and questions in relation to the issue at hand. In other words, it makes individuals to think, question issues, challenge ideas, generate solutions to problems and take intelligent decisions when faced with challenges. Thinking critically as a student will confer benefits in many areas of your life. Critical thinking is different from just thinking. It is meta-cognitive, it involves thinking about your thinking. Critical thinking skills are a vital part of your academic life when reading, when writing and when working with other students.

Lai (2011) sees critical thinking to include the 'component skills of analyzing arguments, making inferences using inductive or deductive reasoning, judging or evaluating, and making decisions or solving problems'. It can be seen as a process that challenges an individual to use reflective, reasonable, rational thinking to gather, interpret and evaluate information in order to derive a judgment. Halpern (1999) views critical thinking as 'purposeful, reasoned, and goal-directed and the kind of thinking involved in solving problems, formulating inferences, calculating likelihoods, and making decisions'. These skills can be taught to students (Lai, 2011) and the fact that instructional practices in our classroom environment do not encourage their inculcation led to this study. It will examine what thinking skills are, the theoretical bases of mediated learning, the instructional practices and the classroom environment that can facilitate thinking skills among Nigerian students.

To think critically is to examine ideas, evaluate them against what you already know and make decisions about their merit. As opined by Klooster (2001), the aim of critical thinking is to try to maintain an 'objective' position. When you think critically, you weigh up all sides of an argument and evaluate its strengths and weaknesses. So, critical thinking skills entail: actively seeking all sides of an argument testing the soundness of the claims made testing the soundness of the evidence used to support the claims.

## Personality Styles

Personality style mostly referred to as personality traits is "conceptualized as the entire mental organization of a person's traits, where traits are defined as a cross-situational and temporally stable set of individual attributes" (Wehrli, 2008). For instance, personality is a stable psychological feature that is related to a broad range of behaviors and attitudes (Correa, 2013). Personality has drawn interest of many researchers in different contexts. Klasa (2009) also defined personality traits as enduring personal characteristics that are revealed in a particular pattern of behaviour in a variety of situations. Kaplan and Saccuzzo in Orluwene (2012) defined personality as the relatively stable and distinctive patterns of behaviour that characterize an individual and his or her reaction to the environment.

Some researchers believed that almost all dimensions of personality should be categorized through big five model's dimensions. The Big Five dimensions have genetic themes and that probably are congenital. The dimensions of this model including extroversion, Agreeableness, Conscientiousness, Neuroticism, and Openness. (Mohamad, Shahraki, Maryam, Mohammad & Amin, 2012). Gosling, Rentfrow, and Swan (2003) argued that the Big Five framework is a hierarchical model of personality trait with five broad factors, which represent personality at the broadest level of abstraction. Each bipolar factor (e.g., Extraversion vs. Introversion) summarizes several more specific facets (e.g., Sociability), which, in turn, subsume a large number of even more specific traits (e.g., talkative, outgoing). Correa (2013) stated that most individual differences in human personality can be classified into five broad, empirically derived domains: extraversion, neuroticism, openness to new experiences, agreeableness, and conscientiousness. Buss (1991) argued that the five-factor model reflects individual differences, which are strongly



related to solving social adaptive problems in an evolutionary context.

### **THEORETICAL FRAMEWORK**

This study is anchored on the Personal Construct Theory which was propounded by George Kelly in 1955 (Pervin & John, 2002). Personal construct theory was presented as an alternative to existing psychological theories. Its basic philosophical assumption, constructive alternativism, asserts that all interpretations of the world are replaceable. People are regarded as operating like scientists, formulating hypotheses, testing these out, and revising those which are invalidated. This process involves the development of a hierarchical system of bipolar personal constructs (e.g. 'kind--unkind'), not all of which have verbal labels. Each construct offers a choice, in that an element of the individual's experience may be construed at one of its poles, the other, or neither, and Kelly considered that people make those choices which most facilitate the anticipation of events. Although there are commonalities between people's construing, particularly within the same culture, each individual's construct system is unique. The essence of all intimate relationships is the construal of another person's construction processes. Personal construct theory views the person holistically, rejecting distinctions between cognition, conation and affect.

Personal construct theory views the person holistically, rejecting distinctions between cognition, conation and affect. Emotion is viewed as the awareness of a transition in construing. In threat, this transition is in core constructs, those central to one's identity. Guilt is the awareness of behaving in a way which is discrepant with one's core role, the constructions determining one's characteristic ways of interacting with others. Anxiety is the awareness that one's constructs do not equip one to anticipate events. Aggression is the active elaboration of construing, while hostility is the attempt to extort evidence for a prediction rather than revising it when invalidated. Other strategies used to cope with invalidation and inconsistencies in construing include constricting one's world to exclude unpredictable events, and, conversely, dilating in an attempt to develop a way of construing the new experiences which one confronts. One may also loosen construing, making one's predictions less precise, or tighten, and more clearly define these predictions. The optimally functioning person is characterized by interplay of such strategies while formulating and revising

constructions, which are closely linked to critical thinking skills, thus the basis of this theory.

### **METHODOLOGY**

**Design:** The design of this study is correlational design. Correlational design is used where a researcher is interested in finding out the extent of relationship between two or more variables.

**Study Area:** This study was carried out in University of Port Harcourt. University of Port Harcourt is one of the 143 universities in Nigeria. It is a conventional, government-owned university and operates both undergraduate and postgraduate programmes.

**Sample and Sampling Procedure:** Simple random sampling technique was used to draw five faculties from the 12 faculties. Simple random sampling technique by balloting was used to draw two departments from each of the five faculties. Proportionate stratified random sampling was used to draw 40 students in 300 levels from the 10 departments.

**Instrument for Data Collection:** Two instruments were used for data collection, namely Cornell Critical Thinking Test Level Z (CCTTZ) and the Goldberg's Big Five Inventory (GBFI). The GBFI is an adapted instrument which covers the five personality traits of conscientiousness, openness to experience, agreeableness, extraversion, neuroticism. The CCTTZ was adopted from Ennis Millman (2005) and consists of seven sections with 52 items measuring how clearly and carefully someone can think.

Copies of the instrument were given to three specialists (two in Educational Psychology and one in Measurement And Evaluation) to study the instrument and determine whether they were actually measure what they were expected to measure. Their suggestions were integrated into the final versions of the instruments before administration. Using Spearman Brown prophecy formulae, the CCTTZ had an internal consistency of 0.581, while the GBEI had an internal consistency of 0.949 for the full test

**Data Collection and Analysis:** Copies of the instrument were given to the respondents directly by the researchers with the assistance of three trained research assistants. The respondents were well instructed on how to fill the instrument and supervised accordingly and the researcher retrieved the instruments on the spot. Research questions one through five were answered using simple linear regression. Research question six was answered using multiple regression. Hypotheses one through



five were tested using t-test associated with regression while hypothesis six was tested with ANOVA associated with multiple regression.

**RESULTS**

**Table 1: Showing extent extraversion predicts critical thinking among undergraduate students of University of Port Harcourt.**

Variables	N	$\bar{x}$	SD	r	r <sup>2</sup>	Adjusted R <sup>2</sup>	Std. Error of the estimate
Extraversion Personality	400	53.8	1.55	0.81	0.65	0.34	1.61
Critical thinking		62.3	1.82				

From Table 1, it can be seen that extraversion obtained a mean score of 53.8 and a standard deviation of 1.55 while critical thinking obtained a mean score of 62.3 and standard deviation of 1.82. Both were correlated at 0.81 correlation coefficient, which indicates a strong positive correlation. The

obtained adjusted R<sup>2</sup> (0.65) showed that extraversion personality accounts for 65% (0.65 x 100 = 65%) variation in critical thinking. Thus extraversion personality trait predicts critical thinking to a high extent.

**Table 2: Regression analysis of significant prediction of extraversion on critical thinking among undergraduate students of University of Port Harcourt.**

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.730	.503		2.144	.000	2.0667	2.2694
	Extraversion personality	1.641	.411	0.68	3.633	.000	2.3149	2.5338

a. Dependent Variable: Critical thinking

Hypothesis one was tested using t-value associated with simple regression. The result obtained shows that the unstandardized regression coefficient of the constant is 1.730 with standard error of .503 while the unstandardized regression coefficient (β) for extraversion is 1.641 with standard error of .411. Thus, the model regression equation to be used in predicting critical thinking on extraversion is

$$Y^1 = 1.730 + 1.641x$$

Where Y<sup>1</sup>= The predicted score on critical thinking  
 x= any given score on extraversion.

The value of the slope b after conversion to standardized coefficients produced a value of 0.68. The standardized regression coefficient of

0.68 is obtained at p-value .000, (p < 0.05). The value of the slope b converted to standardized coefficient is 0.68. This implies that for every one standard deviation increase in extraversion personality trait, score on critical thinking increases by 0.68. From the table it is also seen that a t-test value of 2.144 was obtained with a significant value of 0.00. Hence, since the sig value is lesser than 0.05 alpha therefore, the null hypothesis was rejected. This indicates that extraversion personality traits significantly predicts critical thinking among undergraduate students of University of Port Harcourt.



**Table 3: Showing extent openness to experience predicts critical thinking among undergraduate students of University of Port Harcourt.**

Variables	N	$\bar{x}$	SD	r	r <sup>2</sup>	Adjusted R <sup>2</sup>	Std. Error of the estimate
Openness to experience	400	48.7	1.64	0.87	0.76	0.20	1.410
Personality							
Critical thinking		59.5	1.88				

From Table 3, it can be seen that openness to experience obtained a mean score of 48.7 and a standard deviation of 1.64 while critical thinking obtained a mean score of 59.5 and standard deviation of 1.88. Both were correlated at 0.87 correlation coefficient, which indicates a strong

positive correlation. The obtained adjusted R<sup>2</sup> of (0.76) showed that openness to experience personality accounts for 76% (0.76 x 100 = 76%) variation in critical thinking. Thus, openness to experience personality trait predicts critical thinking to a high extent.

**Table 4: Regression analysis of significant prediction of openness to experience on critical thinking among undergraduate students of University of Port Harcourt.**

		Coefficients <sup>a</sup>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.443	.631		4.541	.000	.677	0.124
	Openness to experience personality	1.600	.583	0.59	8.448	.000	1.522	.346

a. Dependent Variable: Critical thinking

Hypothesis 2 was tested using t- value associated with simple regression the result obtained showed that the unstandardized regression coefficient of the constant is 1.443 with standard error of .631 while the unstandardized regression coefficient ( $\beta$ ) is 1.600 with standard error of .583. Thus the regression model equation to be used in predicting critical thinking on openness to experience is

$$Y^1 = 1.443 + 1.600x$$

Where y<sup>1</sup> = predicted score on critical thinking  
 x = any given score on openness to experience

The value of the slope b after conversion produced a value of 0.59. The standardized regression coefficient of 0.59 is obtained p-value of .000. (p < 0.05). The value of the slope b converted to standardized coefficient is 0.59. This implies that for every one standard deviation increase in openness to experience personality trait, score on critical thinking increases by 0.59. From the table it is also seen that a t-test value of 8.448 was obtained with a significant value of 0.00. Hence, since the sig value is lesser than 0.05 alpha therefore, the null hypothesis is rejected. This indicates that openness to experience personality traits significantly predicts critical thinking among undergraduate students of University of Port Harcourt.



**Table 5: Showing extent agreeableness predicts critical thinking among undergraduate students of University of Port Harcourt.**

Variables	N	$\bar{x}$	SD	r	r <sup>2</sup>	Adjusted R <sup>2</sup>	Std. Error of the estimate
Agreeableness Personality	400	53.1	1.88	0.74	0.54	0.43	1.40
Critical thinking		59.3	1.64				

From Table 5, it can be seen that agreeableness obtained a mean score of 53.1 and a standard deviation of 1.88 while critical thinking obtained a mean score of 59.3 and standard deviation of 1.64. Both were correlated at 0.74 correlation coefficient which indicates a strong

positive correlation. The obtained adjusted R square showed that agreeableness personality accounts for 54% (0.54 x 100 = 54%) variation in critical thinking. Thus agreeableness personality trait predicts critical thinking.

**Table 6: Regression analysis of significant prediction of agreeableness on critical thinking among undergraduate students of University of Port Harcourt.**

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.520	.506		3.481	.000	2.3149	2.5338
	Agreeableness personality	1.498	.613	0.71	6.402	.000	1.2081	1.3466

a. Dependent Variable: Critical thinking

Hypothesis 3 was tested using t- value associated with simple regression the result obtained showed that the unstandardized regression coefficient of the constant is 1.520 with standard error of .506 while the unstandardized regression coefficient (β) for agreeableness is 1.498 with standard error of .613. Thus the regression model equation to be used in predicting critical thinking on agreeableness is

$$Y^1 = 1.520 + 1.498x$$

Where y<sup>1</sup>= predicted score on critical thinking

x= any given score on agreeableness

The value of the slope b after conversion produced a value of 0.71. The standardized regression coefficient of 0.71 is obtained at p-value of .000. (p

< 0.05). The value of the slope b converted to standardized coefficient is 0.71. This implies that for every one standard deviation increase in agreeableness personality trait, score on critical thinking increases by 0.60. From the table it is also seen that a t-test value of 6.402 was obtained with a significant value of 0.00. Hence, since the sig value is lesser than 0.05 alpha therefore, the null hypothesis is rejected this indicates that agreeableness personality traits significantly predicts critical thinking among undergraduate students of University of Port Harcourt.





**Table 7: Showing extent neuroticism predicts critical thinking among undergraduate students of University of Port Harcourt.**

Variables	N	$\bar{x}$	SD	r	r <sup>2</sup>	Adjusted R <sup>2</sup>	Std. Error of the estimate
Neuroticism Personality	400	66.2	0.66	0.78	0.61	0.711	1.421
Critical thinking		50.6	0.73				

From table 7, it can be seen that neuroticism obtained a mean score of 66.2 and a standard deviation of 0.66 while critical thinking obtained a mean score of 50.6 and standard deviation of 0.73. Both were correlated at 0.78 correlation coefficient which indicates a strong

positive correlation. The obtained adjusted R<sup>2</sup> showed that neuroticism personality accounts for 61% (0.61 x 100 = 61%) variation in critical thinking. Thus neuroticism personality trait predicts critical thinking.

**Table 8: Regression analysis of significant prediction of neuroticism on critical thinking among undergraduate students of University of Port Harcourt.**

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.692	.430		8.334	.000	3.5068	3.6865
	Neuroticism personality	1.539	.540	0.71	7.977	.000	2.5351	2.7506

a. Dependent Variable: Critical thinking

Hypothesis 4 was tested using t- value associated with simple regression the result obtained showed that the unstandardized regression coefficient of the constant is 1.692 with standard error of .430 while the unstandardized regression coefficient ( $\beta$ ) for neuroticism is 1.539 with standard error of .540. Thus the regression model equation to be used in predicting critical thinking on neuroticism is

$$Y^1 = 1.692 + 1.539x$$

Where y<sup>1</sup>= predicted score on critical thinking

x= any given score on neuroticism

The value of the slope b after conversion produced a value of 0.71. The standardized regression

coefficient of 0.71 is obtained at p-value of .000. (p < 0.05). The value of the slope b converted to standardized coefficient is 0.71. This implies that for every one standard deviation increase in neuroticism personality trait, score on critical thinking increases by 0.71. From the table it is also seen that a t-test value of 7.977 was obtained with a significant value of 0.00. Hence, since the sig value is lesser than 0.05 alpha therefore, the null hypothesis is rejected this indicates that neuroticism personality traits significantly predicts critical thinking among undergraduate students of University of Port Harcourt.



**Table 9: Showing extent conscientiousness predicts critical thinking among undergraduate students of University of Port Harcourt.**

Variables	N	$\bar{x}$	SD	r	r <sup>2</sup>	Adjusted R <sup>2</sup>	Std. Error of the estimate
Conscientiousness	400	45.4	0.66	0.81	0.65	0.431	1.231
Personality							
Critical thinking		49.3	1.74				

From table 9, it can be seen that conscientiousness obtained a mean score of 45.4 and a standard deviation of 0.66 while critical thinking obtained a mean score of 49.3 and standard deviation of 1.74. Both were correlated at 0.81 correlation coefficient which indicates a strong positive correlation. The obtained adjusted R

square showed that conscientiousness personality accounts for 0.65% (0.65 x 100 = 65%) variation in critical thinking. Thus personality trait of conscientiousness predicts critical thinking.

**Table 10: Regression analysis of significant prediction of conscientiousness on critical thinking among undergraduate students of University of Port Harcourt.**

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.502	1.032		3.549	.000	3.5068	3.6865
	Conscientiousness personality	1.488	2.231	0.85	8.954	.000	2.8029	3.0039

a. Dependent Variable: Critical thinking

Hypothesis 5 was tested using t- value associated with simple regression the result obtained showed that the unstandardized regression coefficient of the constant is 1.502 with standard error of 1.032 while the unstandardized regression coefficient ( $\beta$ ) for conscientiousness is 1.488 with standard error of 2.231. Thus the regression model equation to be used in predicting critical thinking on conscientiousness is

$$Y^1 = 1.502 + 1488x$$

Where y<sup>1</sup>= predicted score on critical thinkin  
 x = any given score on conscientiousness

The value of the slope b after conversion produced a value of 0.85. The standardized regression coefficient of 0.85 is obtained at p-value of .000. (p

< 0.05). The value of the slope b converted to standardized coefficient is 0.85. This implies that for every one standard deviation increase in conscientiousness personality trait, score on critical thinking increases by 0.85. From the table it is also seen that a t-test value of 8.954 was obtained with a significant value of 0.00. Hence, since the sig value is lesser than 0.05 alpha therefore, the null hypothesis is rejected this indicates that Conscientiousness personality traits significantly predicts critical thinking among undergraduate students of University of Port Harcourt.



**Table 11: Showing extent extraversion, openness to experience, agreeableness, neuroticism and conscientiousness jointly predicts critical thinking among undergraduate students of University of Port Harcourt.**

Variables	N	$\bar{x}$	SD	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Std. Error of the estimate
Extraversion	400	45.3	0.55	0.80	0.64	1.065	1.321
Openness to experience		63.3	1.62				
Agreeableness		55.4	1.66				
Neuroticism		49.5	0.55				
Conscientiousness		53.4	1.48				

From table 11 above, it could be seen that the relationship between critical thinking and extraversion, openness to experience, agreeableness, neuroticism and conscientiousness combined correlated at 0.80 correlation coefficient, which indicates a strong positive correlation. An R<sup>2</sup> of 0.64 was obtained, however, for a more reliable result; adjusted R<sup>2</sup> obtained at 1.065 was used to

answer the research question. The obtained adjusted R<sup>2</sup> showed that extraversion, openness to experience, agreeableness, neuroticism and conscientiousness-combined accounts for 64% (0.64 x 100 = 64%) variation in critical thinking. Thus, joint personality traits of extraversion, openness to experience, agreeableness, neuroticism and conscientiousness predicts critical thinking to a high extent.

**Table 12: Analysis of variance significant prediction of extraversion, openness to experience, agreeableness, neuroticism and conscientiousness on critical thinking among undergraduate students of University of Port Harcourt significantly**

ANOVA<sup>a</sup>

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1822.670	5	230.590	228.543	.000 <sup>b</sup>
	Residual	523.492	394	1.215		
	Total	2346.162	399			

a. Dependent Variable: Critical thinking

b. Predictors: (Constant), Extraversion Personality, Openness to experience, Agreeableness personality, Neuroticism personality and Conscientiousness Personality.

Table 12 has shown that when converted to *F*, the correlation has an *F* ratio of 230.590 that is significant ( $p \leq .05$ ). This implies that Extraversion, openness to experience, agreeableness, neuroticism and conscientiousness jointly predict critical thinking among undergraduate students of University of Port Harcourt significantly.

**DISCUSSION OF FINDINGS**

Personality trait of extraversion accounts for 65% variation in critical thinking. This indicates

that extraversion personality trait significantly predicts critical thinking among undergraduate students of University of Port Harcourt. This finding is similar to that of Ulolo, Gatu and Adewumi (2000) where the stated among others that students with extraversion personality style have a higher level of critical thinking than students with other personality styles. Furthermore, this study is contrary to that of Okaro, Rita and Okadire (2009) where they stated among others that extraversion personality trait to a low extent influence students' critical thinking. This variation



could be because of the population of the study as that Okaro et al used polytechnic students against this current study which used undergraduate students.

Personality trait of openness to experience accounts for 76% variation in critical thinking. This indicates that openness to experience personality trait significantly predicts critical thinking among undergraduate students of University of Port Harcourt. This finding is contrary to that of Otimkpa (2012) where he stated that students with openness to experience personality traits have the lowest level of critical thinking among other personality traits. The variation could be as a result of the fact that Otimkpa used post graduates students as opposed to this study which used undergraduate students. Furthermore, this finding is similar to that of Masiu and Dennis (2010) where they stated among others that there is significant relationship between personality trait of openness to experience and critical thinking among engineering students.

Personality trait of agreeableness accounts for 54% variation in critical thinking. This indicates that agreeableness personality trait significantly predicts critical thinking among undergraduate students of University of Port Harcourt. This finding is similar to that of Mark, Odoko and Uko (2010) where they stated among others that graduates with agreeableness personality trait have a better and higher level of critical thinking.

Personality trait of neuroticism accounts for 61% variation in critical thinking. This indicates that neuroticism personality trait significantly predicts critical thinking among undergraduate students of University of Port Harcourt. This finding is contrary to that of Olakunle (2000) where he stated that there is negative relationship between neuroticism personality trait and critical thinking of students. The variation could be resulting from the fact that Olakunle used secondary school students for his study while this current study used undergraduate students. Furthermore, this finding is similar to that of Odoko (2011) where he stated among others that students' neuroticism personality trait have a high level of critical thinking.

Personality trait of conscientiousness accounts for 65% variation in critical thinking. This indicates that conscientiousness personality trait significantly predicts critical thinking among undergraduate students of University of Port Harcourt. This finding is similar to that of Coockey

(2014) where he stated among others that staffers with conscientiousness personality trait have a better level of critical thinking compared to those with other personality styles. Furthermore, this finding is also similar to that of Zhang (2002) where he stated that conscientiousness is significantly and positively correlated with the hierarchical thinking style.

Personality trait of extraversion, openness to experience, agreeableness, neuroticism and conscientiousness combined accounts for 65% variation in critical thinking. This implies that extraversion, openness to experience, agreeableness, neuroticism and conscientiousness jointly significantly predict critical thinking among undergraduate students of University of Port Harcourt. This finding is similar to that of Mohamad, Kave, Maryam, Mohammad and Amin (2012) where the stated that all of personality traits influenced critical thinking skills of the graduate students and also these traits totally explained 51% of critical thinking variance.

## RECOMMENDATIONS

Based on the findings of this study, the following recommendations were made:

- 1) Students should engage in activities that can help to improve their critical thinking skills and ability.
- 2) Teachers should adopt teaching skills that will improve students' level of critical thinking skill.
- 3) The school curriculum should make provision for compulsory courses that would help students in developing their critical thinking skills.
- 4) Classroom teaching ought to move away from the teacher centered and disciplined-focused instruction. Instead, teachers should employ teaching methods in which the students are actively involved

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