

PERSONALITY TRAITS AND LEARNING APPROACHES: ARE THEY INFLUENCING THE LEARNING PROCESS?

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ABSTRACT

The relationship between the big five personality traits, Extraversion, Agreeableness Neuroticism, Conscientiousness and Openness to Experience and deep and surface approaches to learning forms the basis of this article. The findings of a research study in this milieu will be presented to prove that earlier studies in this field have been upheld, but that an important deviation has occurred on certain levels of personality. A student's way of learning implies the type of learning that is taking place. Ultimately we as lecturers want to encourage deep learning as this stimulates retention of information, important in production of students that are ready for employment.

Keywords: Personality traits, Five-Factor Model, Big Five Traits, Neuroticism, Extraversion, Openness to Experience, Conscientiousness, Agreeableness, approach to learning, deep approach to learning and surface approach to learning.

1. INTRODUCTION

The inner thoughts, feelings and nature of individuals translate into the concept of personality which has kept researchers such as Freud, Pavlov and Rogers actively engaged in debates and further research for years. It comes naturally for a lecturer to observe different personality traits in a class setting. There are students who engage in the work at a deep and knowledgeable level. Conversely, there are those students who presumably just learn facts in order to pass the evaluations. These observations led to a literature search in which the researcher uncovered the concepts of deep and surface learning, which are opposing components of the phenomena called *learning approach*. This research study was undertaken with a view to establish whether the said relationship between learning approaches and personality (Biggs 1987:5) exists for students in their second year enrolled in a Commercial Law module at a central university of technology.

The changing landscape of higher education in South Africa such as massification (increased access for previously disadvantaged groups) and student through-put policy directives have caused a diversity of new student related problems to emerge. Examples of this are the high incidence of under prepared students, classes that are too full and students are not receiving enough personal attention as well as students employing inappropriate approaches to learning, this is evident in the high failure rate at tertiary institutions. These problems can influence the student's personality, which

affects the students learning approach. This corresponds with Biggs (1992:9) when he rightly states that "... the longer students are exposed to institutional learning, the more surface and less deep oriented their approaches to learning become". Students of all social classes now have access to tertiary education, but lack the emotional strength to complete their studies (Burton & Nelson 2005:66). Accordingly, it has thus become apparent that students learn to pass evaluations, rather than to engage the work and create a better understanding of the subject content.

1.1. Rationale of the study

Zhang (2003:1433) states that "...the role of the big five personality traits in student learning has not been given the attention that it deserves". Later research done by Duff *et al.* (2004:1910) supported Zhang's statement "...works considering the relation personality may play in determining an individual approach to learning is still in its infancy". The research study therefore intended to further the knowledge on, and provide a deeper understanding of, the association between personality traits and learning approaches. The results of this study are important for Higher Education Institutions as it can direct lecturers in the use of different modalities to address diverse learning styles and dissimilar personality types within a single lecturing milieu.

1.2. Significance of the study in relation to Educational Policies

Policy directives have resulted in an increase in the number and diversity of students at South African higher education institutions (Republic of South Africa 1997; Republic of South Africa Department of Education 1997; Republic of South Africa Ministry of Education 2001). However, these students may not be adequately prepared nor motivated to be academically successful. This is aggravated by the fact that the higher education institution does not provide an atmosphere that encourages academic success (Biggs 1992:9). Subsequently, it is necessary to gain a better understanding of the factors that impact on academic success. Personality traits and learning approaches are two such factors. Additionally, the knowledge gained from this research study can be applied at institutions of higher learning to ensure that academic success is achieved. New policy directives which address specific needs in a student are required to assist the student to reach his or her full potential.

2. CRITERIA OF THIS STUDY

This study uses as the two opposing poles: the five personality factors and the two learning approaches of students at a tertiary institution. The study was conducted by using three different questionnaires to obtain the information on which the conclusions were based. These questionnaires will be briefly discussed later on in the article.

2.1. Personality and Personality Factors (traits)

An on-line psychological website defines personality as follows: "Personality is a person's unique behavioural and cognitive patterns; or, a person's unique consistent pattern of thinking, feeling, and acting." (Personality Psychology 2008:2 of 6). People are different due to certain aspects (personality traits) which shapes their behaviour. Pervin (1989:4) rightly states that there is no broadly agreed-upon single definition of personality.

A trait is a distinguishing feature of a person's character or personality. According to Baughman and Welsh (1962:306), a trait is "...any distinguishable, relatively enduring way in which one individual differs from another."

2.2. How is personality categorised?

According to AIPsych (2004:1 of 5), the Big Five factors have been coined into the acronym OCEAN (of human personality) and can be summarised according to their factor status as follows:

- E :** Factor I: Extraversion (enthusiastic, energetic and assertive);
- A :** Factor II: Agreeableness (sympathetic, kind, affectionate);
- C :** Factor III: Conscientiousness (thorough, systematic and organised);
- N :** Factor IV: Neuroticism (anxious, moody and tense);
- O :** Factor V: Openness to Experience (imaginative, insightful and having wide interests). (Srivastava 2008:1 of 5).

2.2.1. Factor I: Extraversion (E)

This factor is sometimes labelled Positive Emotionality or Extraversion and refers to the degree to which a person enjoys being sociable, likes exhilaration and stimulation and is cheerful in nature. This factor describes how energetic and enthusiastic a person is when dealing with other people. The five facets that make up Extraversion are social interaction and leadership; enthusiasm and passion; being emotionally sound and positive; gregariousness and sociability; excitement seeking and being elated (Taylor & De Bruin 2006:3). High scorers tend to find the company of others stimulating and they enjoy the excitement of crowds.

Individuals scoring low in Extraversion, known as introverts, are actually not the opposite of extroverts. This means that they are not unavoidably gloomy, withdrawn and miserable. They do however tend to be reserved, aloof and lack the energy levels of traditional extroverts (Zhang 2002:19; Heinström 2003:7 of 17; Taylor & De Bruin 2004:20; Roffe 2005:3 of 15). Low scorers tend to be serious and they prefer not to interact with large groups of people. These individuals tend to be overwhelmed by crowds and their need for privacy and time to themselves is much greater than their need to interact. The

significance of a low scorer is that this individual is often in the background and tends not to ask questions which could clarify difficult concepts. In a higher education scenario a low scorer could be negatively impacted by his own personality, which prevents him or her from participating in group discussions.

2.2.2. Factor II: Agreeableness (A)

Agreeableness is a tendency to be compassionate and cooperative and to strive for social harmony. People scoring high on this factor endeavour to get along with other people, they are generally considerate, friendly and helpful. These people usually believe that others are inherently good, honest and trustworthy (McCrae & John 1992:196).

Individuals scoring low on Agreeableness are often sceptical, manipulative, aggressive and self-seeking. They are less eager to show a helping hand and can be weary about the motives of other people, causing them to be unfriendly, suspicious and hostile. (Zhang 2002:19; Heinström 2003:7 of 17; Taylor & De Bruin 2004:25; Roffe 2005:11 of 15). Low scorers can distrust fellow students, leading to a one-sided approach. Students having a low score in this factor are highly competitive and would rather work alone than in groups. These individuals believe they are superior to those around them. Because of this attitude they seldom ask for help in class and would more often search for what they believe is the truth elsewhere. Their interpretation of the work is often warped, but they are too conceited to ask for advice.

2.2.3. Factor III: Conscientiousness (C)

This factor implies that the people who have high levels of conscientiousness are methodical, tidy and neat. These people have self-discipline to immediately start a task and complete it, which implies that they are hardworking, diligent and purposeful. They are highly motivated and adhere to principles, fulfil moral obligations and are reliable and dependable. They are not impulsive and they think before they act (Taylor & De Bruin 2004:27).

Researchers such as McCrae and John have been uncertain about the specific meaning of Conscientiousness. Does Conscientiousness organise and guide behaviour and would this indicate that a low scorer displays impulsive behaviour? In 1992 McCrae and John cast certainty on this issue and in a test found that a person scoring high in conscientiousness has the ability to integrate both impulsive and thorough behaviour (Taylor & De Bruin 2004:26). Low scorers are less focused and easy going. These individuals lack ambition and struggle to keep to parameters set by society. These students are often over emotional and have an out of control feeling. They tend not to attend classes on a regular basis and hence they are always behind with their work. They are unable to fully explain themselves in tests and evaluations, as they struggle to draw the line between different subject matter. Due to their low self-discipline they are easily discouraged and struggle to

complete tasks. If the work is presumed as difficult it is easier for them to quit than to try and understand the work.

2.2.4. Factor IV: Neuroticism (N)

Neuroticism refers to the aspect of a person's emotional stability (or instability) and the general tendency to be negative and pessimistic to what is going on around them (McCrae & John 1992:195).

The decisive factor in Neuroticism is the tendency to suffer negative emotions such as pessimism, apprehension, antagonism, repulsion, fear, unhappiness, guilt and discomfort. These individuals are vulnerable to stress and have the ability to interpret situations as threatening and succumb to the feeling that all is lost, even in minor problematic situations.

Costa and McCrae (Taylor & De Bruin 2004:18) state that individuals that are low in Neuroticism are emotionally stable, even-tempered, peaceful, level-headed and free from persistent negative feelings (Zhang 2002:19; Taylor & De Bruin 2004:18-19; Roffe 2005:12 of 15 ; Burton & Nelson 2005:2). These individuals are not easily upset and tend to be calm and relaxed under pressure. These students are not concerned about the outcomes of an assessment as they do not suffer from the mistaken impression that people are watching and judging them. They tend to be more open to interaction with the lecturer, as they do not become nervous in social situations. They have the ability to question actions of those that they perceive as their superiors. These individuals often feel capable and competent in difficult situations. Because these students cope under pressure they tend to be clear-thinking in evaluations and subsequently have the ability to convey the answer in an understandable manner.

2.2.5. Factor V: Openness to Experience (O)

This factor measures the depth, breadth and unpredictability of an individual's imagination and the desire for new experiences. People with a high openness to experience score have broad interest fields, are inquisitive about the world around them, have cultural interests, educational aptitude and are creative (Heinström 2003:5 of 17). They have a tendency to appreciate aesthetics and often re-examine social, political and religious values. Openness to experience is often criticized as being too broad a label for the trait it attempts to define. Researchers such as Saucier and Goldberg (1996:24) have suggested that this dimension be labelled intellect or imagination, but due to the constraints of the definition of these terms researchers abide by openness due to lack of a better label (Lawrence & Oliver 2001:21).

Low scorers prefer routine and they relate better to fact than fantasy. They keep their minds on the task at hand and find satisfaction in doing well in assessments. These students prefer routine and are uncomfortable with

change. They accept authority and as a result they subject themselves to the lecturer in a class environment. They tend to study with insight as it gives them a sense of accomplishment to understand the work and subsequently giving an enlightened answer.

3. APPROACHES TO LEARNING

Maples and Webster (1980) as cited in Merriam and Caffarella (1998: 124) defines learning as "...a process by which behaviour changes as a result of experience". Biggs (1994:24) defines Learning Approaches as "...the ways in which students go about their academic tasks, thereby affecting the nature of the outcome." Due to the immense nature of Learning Approaches, this research study has utilised the revised two-factor Study Process Questionnaire (R-SPQ-2F) to test the group of second year students in a Commercial Law module at a university of technology in South Africa. The two approaches to learning can be identified as follows: a deep approach allows the student to understand the work because the student becomes absorbed in the study material. The students show an interest in the work and can successfully apply the contents of the work to a real life scenario with a true sense of understanding. In contrast a surface approach to learning is only employed by the student who wants to remember the basic facts of the study material (Biggs 2003:17). The student has no intention of understanding the deeper meaning of the work. The main motivation for using this approach is only to pass the subject without knowledge retention. Biggs (1994:24) defines learning approaches as "...the ways in which students go about their academic tasks, thereby affecting the nature of the outcome."

3.1. The Deep Learning Approach

The deep approach to learning is the attempt the student makes to understand and make sense of what is to be learnt, utilising ideas and concepts. The student involves the process of thinking, seeking integration between components and tasks and searching for an underlying meaning (Atherton 2005: 2 of 6).

The result of deep learning is the retention of ideas on a long term basis and the understanding and interpreting of the course material as a continuous life-long learning experience (Houghten 2004:1 of 6; Diseth 2003:145). Students express excitement and gratification towards the academic challenge set for them.

3.2. The Surface Learning Approach

In direct contrast to deep learning, surface learning focuses on the here and the now. The student only focuses on unrelated parts of the task, with the main objective to utilise information for assessment goals only. The surface approach is used as a tool to accomplish short term goals, to memorise facts

and to place emphasis on the reproduction of information (Ramsden1992: 30). The main motivation for surface learning is fear of failure, while the students feel boredom and experience anxiety while they struggle with the subject content (Ramsden, Beswick & Bowden : 1989:158). The following diagram gives a structured idée of the differences between these two learning approaches

<u>Deep approach</u>	<u>Surface approach</u>
Intention – to comprehend ideas for yourself and seek meaning by: <ul style="list-style-type: none"> • Relating ideas to previous knowledge and experience • Looking for patterns and underlying principles • Checking evidence and relating it to conclusions • Examining logic and argument cautiously and critically • Being aware of understanding developing while learning • Becoming actively interested in the course content 	Intention – to manage with course requirements and reproduce knowledge by: <ul style="list-style-type: none"> • Treating the course as unrelated bits of knowledge • Memorising facts and carrying out procedures routinely • Finding difficulty in making sense of new ideas presented • Seeing little value or meaning in either courses or tasks set • Studying without reflecting on either rationale or approach Feeling undue pressure and worry about work

(Adapted from Entwistle, McCune & Walker 2001 in Coffield et al. 2004:94)

4. THE RELATIONSHIP BETWEEN LEARNING APPROACHES AND PERSONALITY TRAITS

Biggs (1987:5) asserts that various researchers (Frenkel Brunswik 1949; Rokeach 1960, Hudson 1966; Schroder, Driver & Streufert 1967) have identified a correlation between personality traits and learning approaches. Heinström (2000:1of17) theorised that "...personality traits serve as directors or blocks for motivation and learning strategies (approaches)". For the past three decades, the ways in which students approach learning have been examined and a great deal research has also focused on the effect of personality and learning approaches on students' academic achievement (Duff et al. 2004; De Bruin 2007). Numerous researchers such as Frenkel Brunswik in 1949 and Rokeach in 1960 have identified a relationship between personality traits and learning approaches. These factors have an influence on the learning approaches employed by students within a higher education environment. Recent studies, inter alia, by Heinström in 2000 and Zhang in 2003 have investigated the relationship between learning approaches and personality and have establish that specific personality traits can be correlated with particular learning approaches. This research study found same.

5. QUESTIONNAIRES

In this study, the following questionnaires were used to attain the information. These questionnaires have suitably been used in the past to determine both the traits that a person exhibits as well as the preferred learning approach a person has a predisposition to:

- the BTI-S;
- the R-SPQ-2F; and
- the PSQ.

5.1.1. Basic Traits Inventory: Short Form (BTI-S)

The Basic Traits Inventory (BTI) was developed by Taylor and De Bruin (2004, 2006) from the Neuroticism, Extraversion and Openness to Experience Personality Item Pool Representation Inventory (otherwise known as NEO PI-R) developed by Costa & McCrae (1992) as cited in Taylor & De Bruin (2004:5). It consists of 173 items measuring the Big Five personality traits (Taylor & De Bruin 2004:67). The shorter research version known as the BTI-S was developed by Taylor and De Bruin from the BTI and consists of 77 items. It is this shortened version that was used in this research study. Test items are rated on a five-point Likert scale with "Strongly disagree" and "Strongly agree" as opposing poles. It has acceptable psychometric properties across cultural groups and is developed for the South African population with at least a Grade 12 educational level (Taylor 2004:67). The BTI-S has acceptable coefficient alpha levels of reliability (Taylor 2004:82).

5.1.2. The revised two-factor Study Process Questionnaire (R-SPQ-2F)

The R-SPQ-2F is a 20-item questionnaire developed by Biggs which measures whether a student applies deep or surface learning. The questionnaire provides feedback on the learning approaches in the two domains, namely, the surface and deep domains which are further categorised into deep and surface motives and deep and surface strategies used by the student (Chamorro-Premuzic, Furnham, & Lewis 2007:249). Each scale has 5 items, therefore there are 10 items measuring each approach (Biggs et al. 2001:133) with a total of 20 items. The items are written as statements about behaviour to which the student must indicate the extent to which the behaviour is a true reflection of their own behaviour. The 5-point Likert-type retorts range from "this item is never or only rarely true of me" to "this item is always or almost always true of me" (Biggs et al. 2001:148). The R-SPQ-2F has acceptable Cronbach alpha values for scale reliability. Both surface and deep approach scales also have well documented strategy and motive subscales (Biggs et al. 2001:133).

5.1.3. The Psycho-Social Questionnaire (PSQ)

The PSQ was developed by Viljoen in 2007 and is a tool for the measurement of psycho-social background factors of students. It consists of 19 items ranked on a Likert scale which collects information on both subjects' childhood (emotional support, socio-economic situation, conduciveness of environment to learning and depression) as well as their present situation. In a pilot study, the PSQ has demonstrated a Cronbach coefficient alpha reliability of 0.82 (Viljoen 2007b). The reason for the inclusion of this questionnaire is to identify if personal criteria influences the students approach to learning. As will be shown, this questionnaire showed that personal circumstances do not have an effect on the approach a student utilises in the learning process. This questionnaire served as an isolator.

5.2. Research Design and Methodology

This research was conducted using a quantitative non-experimental, inferential multivariate design. The research that was done on the sample group was non-experimental research as the researcher was unable to manipulate the independent variables as their manifestations had already occurred. As the sample was only tested once, this type of research can be labelled as cross-sectional research according to Babbie (1995:95).

5.3. Population and Sampling

Whole-frame sampling was used based on the principle of convenience sampling, as all students who registered for the module in Commercial Law were included in the research study (Hopkins 2000: n.p.). The research was conducted at the Central University in Bloemfontein, Free State Province in a single stage process. The student group that was used were students in their second year of a Commercial Law module.

5.4. Data collection

The questionnaire was administered to all Commercial Law for Accountancy students in their second year at a specific time, date and venue. Students were assured that participation was voluntary and that all data obtained would remain both confidential and anonymous. The questionnaires were then scored and delivered to the Statistics Department of the University of the Free State.

6. RESULTS OF RESEARCH

6.1. Descriptive Analyses: Categorical Confounding Variables

The categorical confounding variables consist of: gender, language and ethnicity.

Gender

Table 1.1: Gender distribution of the respondents in the sample (n=65)

Variable	Categories	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Gender	male	32	49.23	32	49.23
Gender	female	33	50.77	65	50.77

The sample was made up of 65 students. In this sample there were 33 (50.77%) female students and 32 (49.23%) male students. The number of males and females who participated in this research study was almost evenly balanced.

Home Language

Table 1.2: Home language of respondents in the sample (n=65)

Variable	Categories	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Language	afrikaans	4	6.15	4	6.15
Language	english	2	3.08	6	9.23
Language	tswana	13	20.00	19	29.23
Language	sotho	32	49.23	51	78.46
Language	xhosa	9	13.85	60	92.31
Language	other	5	7.69	65	100.00

The sample group was made up according to their first language preferences, as follows: 4 (6.15%) Afrikaans speaking students; 2 (3.08%) English speaking students; 13 (20.00%) Tswana speaking students; 32 (49.23%) Sotho speaking students; 9 (13.85%) Xhosa speaking students and 5 (7.69%) consisting of students who speak other South African languages. The reason for the high percentage of Sotho speaking students is reflective of the area in which this university of technology is situated, i.e. the area in which the research study was conducted.

Ethnicity

Table 1.3: Ethnicity of respondents in the sample (n=65)

Variable	Categories	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Ethnicity	Black	60	92.31	60	92.31
Ethnicity	Coloured	3	4.62	63	96.92
Ethnicity	White	2	3.08	65	100.00

Ethnically the students were divided into 60 (92.31%) black students; 3 (4.62%) coloured students and 2 (3.08%) white students. This data suggests that there is no real representation of the South African population in this sample; therefore no comment can be made about the cross-cultural applicability of this analysis.

6.2. Descriptive Analyses: Continuous Confounding Variables

The Continuous Confounding Variables consist of Psycho-Social background factors and age. Psycho-Social Background factors and Age

Table 1.4: Psycho-Social Background factors of respondents in the sample (n=65)

Variable	N	Mean	Std Dev	Minimum	Maximum	Median
Psycho Social	65	75.78	18.08	47.00	120.00	71.00
Age	65	21.86	3.14	18.00	37.00	21.00

The PSQ Questionnaire is made up of 19 items with the following components (Viljoen 2007): emotional support (childhood years); socio-economic support (childhood years); environment conducive to learning (childhood years); depression (childhood years) and finances, love life, family members, depression and HIV/AIDS anxiety (present situation).

As the PSQ questionnaire is designed as a six-point Likert scale, the maximum score for each item is six, thus giving a maximum total score for the questionnaire of 114. A high score reflects negative psycho-social circumstances, whereas a low score reflects positive psycho-social circumstance.

The median for this score is 71.00, but the mean score is 75.78. This indicates that the score distribution is slightly skewed to the left (or positively inclined).

There is a slightly higher occurrence of less favourable psycho-social background factors amongst the students of the sample.

The age of the students varies between 18 and 37 years. The mean age is 21.86 years. This indicates that this course is popular among school leaving students and students who are already in their thirties. This result suggests that the course caters for school leavers and people wishing to pursue further education at a later stage in their lives.

6.3. Descriptive Analyses: Continuous Independent Variables (Personality Traits)

Table 1.5:The personality traits of the respondents in the sample (n=65)

Variable	N	Mean	Std Dev	Minimum	Maximum
Extra	65	0.42	0.64	-1.48	2.06
Neuro	65	-0.33	0.76	-2.45	1.51
Consc	65	0.98	0.83	-0.75	3.84
Open	65	0.89	0.72	-0.45	2.86
Agree	65	1.28	1.03	-1.07	4.73

The statistics regarding personality traits were obtained from students in the sample by means of the BTI-S (Taylor & De Bruin 2006) and indicate scores obtained for Extraversion, Neuroticism, Conscientiousness, Openness to Experience and Agreeableness.

6.4. Descriptive Analyses: Dependent Variable (Approaches to Learning)

Table 1.6:Approaches to learning of the respondents in the sample (n=65)

Variable	N	Mean	Std Dev	Minimum	Maximum	Median
StudyP	63	61.58	8.19	44.00	81.00	61.00

The statistics for the Approaches to Learning (either deep or surface) were obtained from the students in the sample by means of the R-SPQ-2F (Biggs *et al.* 2001). The minimum score obtained by the students was 44.00.

Conversely the maximum score obtained was 81.00. The statistical analysis indicates that students who obtained a high score frequently engage in deep learning. On the other hand, students who obtained a low score frequently employ a surface approach to learning.

The mean (61.58) and the median (61.00), as measures of central tendency, indicate that the allocation of scores is skewed to the left (or positively inclined) and demonstrate that the students employed a slightly more deep approach to learning.

7. ANALYSES OF ASSOCIATION

7.1. A Stepwise Model Selection

Analysis of covariance techniques was used in the analysis of data. The analysis of covariance model for the learning approach score contained the five independent variables (in other words, the five personality traits of Extraversion, Neuroticism, Conscientiousness, Openness to Experience and Agreeableness) as well as all probable confounders (age, gender, home language and psycho-social score) (Schall 2009 :personal communication).

F-statistics and associated p-values were calculated for each variable in the model. The Stepwise model of selection was applied. This model was implemented by eliminating, one at time, that variable in the midst of the confounders, which was least significantly associated with the outcome. This was only if the p-value was at least 0.1. The personality factors were dealt with in a similar way. The potential confounding variables of language, age and gender obtained the following p-values respectively: age and language - 0.0030; age- 0.8953 and gender-0.9702. As these p-values were not less than the 0.05 level of significance, these potential variables were not significant. These variables were then consecutively removed from the model through the stepwise model selection procedure as discussed earlier (See Table 1.7 below). (Schall 2009: personal communication). In addition, Openness (p-value 0.7998), Agreeableness (p-value 0.7218) and Conscientiousness (p-value 0.2682) were found to have no significance. Consequently, they were removed from the model through the stepwise model selection procedure.

Extroversion (p-value=0.0001) and Neuroticism (p-value=0.0001) was found to be significantly associated with learning approaches. The following table demonstrates the various models fitted, and specifies which variable was eliminated from the model using the stepwise procedure.

Table 1.7.: Stepwise model selection of predictors of students' Learning Approach

Model	Independent variables in the model	Variable removed from the model	F-statistic (for variable to be removed)	Degrees of freedom	p-value
1	Extra, Neuro, Consc, Open, Agree, Age, PsychoS, Gender, Language	Language	0.09	5,51	0.9930
2	Extra, Neuro, Consc, Open, Agree, Age, PsychoS, Gender	Gender	0.00	1,56	0.9702
3	Extra, Neuro, Consc, Open, Agree, PsychoS, Age	Age	0.02	1, 57	0.8953
4	Extra, Neuro, Consc, Open, Agree, PsychoS	Open	0.06	1, 58	0.7998
5	Extra, Neuro, Consc, Agree, PsychoS	Agree	0.13	1, 59	0.7218
6	Extra, Neuro, Consc, PsychoS	Consc	1.25	1,60	0.2682
7	Extra, Neuro, PsychoS,	Psycho	2.41	1,61	0.1257
8	Extra, Neuro,	None – Final Model			

Table 1.8. demonstrates that Extraversion F ($P < 0.0001$) and Neuroticism F ($P < 0.0001$) are significantly associated with learning approach. The regression coefficients linked to the two model indicates the following:

- An increase of one point on the Extraversion scale is associated with an average increase in StudyP (learning approaches) of 11.10 points and;
- Likewise, an increase of one point on the Neuroticism scale is associated with an average increase in StudyP (learning approaches) of 8.56 points (Schall 2009 :personal communication).

Table 1.8: ANOVA of student's learning approach: regression coefficients

Factor	Mean square	F-statistic	df	P-value	Regression Coefficient	
					Estimate	SE
Extra	2840.6	567.2	1	<0.0001	11.10	0.47
Neuro	2443.3	487.9	1	<0.0001	8.56	0.39
Residual	5.0		62			

In this research study a high score obtained on the R-SPQ-2F is associated with a deep approach to learning. An increase in Extraversion is thus linked to an increase in a deep approach to learning. As the p-value for Extraversion is < 0.0001 , it denotes a statistically significant relationship between Extraversion and a deep approach to learning. Similarly, an increase in Neuroticism is associated with a deep approach to learning. Specifically, as the p-value for Neuroticism is < 0.0001 , it denotes a statistically significant relationship between Neuroticism and the deep approach to learning.

8. DISCUSSION OF RESULTS

A sample of 65 students registered for Commercial Law module in their second year at a university of technology participated in the research study to establish if there is an association between personality traits and approaches to learning. The biographical data which is the categorical confounding variables of gender, language and ethnicity and the continuous confounding variables of psycho-social background and age were analysed descriptively. After the data obtained was scored and statistically analysed, it was found that these confounding variables had no significant relationship or effects on the

research results.

The statistical tests have resulted in indicating some distinct relationships between personality traits and learning approaches. However, some contradictory information has been revealed in the research findings regarding Neuroticism, which will be discussed shortly. In the research study a statistically significant association was established between Extraversion and a deep approach to learning ($p < 0.0001$). This is in agreement with research conducted by Chamorro-Premuzic *et al.* (2007) but is in contrast to the research findings of Zhang (2001b:1440) and Hu (s.a.:5 of 12) who state that Extraversion does not display a clear pattern of relationship to any of the learning approaches.

It can be theorised that this positive and enthusiastic approach to life can be generalised to the respondents' approach to learning as well. Therefore they approach their studies positively and fervently. The research results have surprisingly established that the speculated negative association between Neuroticism and a deep approach to learning does not exist. This is similar to the result obtained in a comparable research study at a university of technology in Welkom, South Africa in 2008 (Hoare 2009:88). A statistical analysis with a stepwise model confirmed that the p-value for Neuroticism is < 0.0001 . This confirms a statistically significant relationship between Neuroticism and a deep approach to learning. This result is in contrast with previous studies conducted in this field, which state that Neuroticism is positively associated with a surface approach to learning (Zhang 2002:19; Taylor & De Bruin 2004:18; Roffe 2005:12 of 15 ; Burton & Nelson 2006:2). This contradictory result justifies further research. The finding of the present research study that Neuroticism is significantly associated with a Deep Approach to learning can also be explained when taking the research findings of Zhang into consideration. Zhang (2001b:1440) states that "although people with a strong neuroticism personality trait tend to use the surface approach to learning, they may not necessarily have a tendency for not using the deep approach to learning".

9. CONCLUSION

The Academic society in South Africa could benefit tremendously from a replication of the present study, but on a larger scale with a sample that is more representative of the South African population. The sample from the present study consisted mainly out of African respondents; it would be interesting to investigate whether the inconsistency in results between the present and prior studies is a function of ethnicity or culture. Further investigation in this area is definitely justified. This replication could be conducted at different higher education institutions to gain a diversity of insights in different geographical areas.

10. REFERENCE

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