An Investigation into the Association Between Personality Traits and Learning Style Preferences.

Meabh Reid

N00201097

Research Supervisor: Eva Garcia- Albarran

Dissertation submitted as a requirement for the degree of BSc (Hons) in Applied Psychology,

Dun Laoghaire Institute of Art, Design & Technology, 2024

Due Date: 08/ 04/ 2024

Declaration

I declare this is my own work. Where I have read, consulted, and used the work of others I have acknowledged this in the text.

Word count: 5000

Signature: Meabh Reid

Date: 08/04/2024

Acknowledgements

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ABSTRACT

Abstract

The present study aimed to investigate an association on learning style model preference (Single model and Multi model) based on personality type (Agreeableness, Openness and Extraversion).

A cross sectional questionnaire based quantitative within design was employed. 150 participants agreed to participate through convenience sample accessed through an online link on social media platforms. The sample consisted of 35 men (23.3%) and 115 women (76.7%). Age ranged from 18 and older. The participants completed the VARK Online Questionnaire and the Big Five Inventory Questionnaire. Chi Square of Independence was conducted using IBM SPSS Software between each personality trait (low, moderate and high) and VARK learning preference. Results showed an overall non-significant association on any hypothesis. There was a significant difference between gender and Agreeableness. The results from the current study are in line with some studies (Kamarulzaman, 2012, Seyal et al, 2019). Limitations included complications within VARK questionnaire for reliability and clarity for the researcher. Three personality traits out of five could be used to avoid ethical consideration.

INTRODUCTION

Introduction

"Personality and cognitive ability are consequential domains of human individuality (Stanek & Ones, 2023).

1.1. Learning Styles Definition and Background

While a concise definition of learning itself is difficult to obtain, "there is no general agreement about the definition of learning" (De Hower et al., p. 20, 2013). Reliability for learning styles can cause implications for research, Kolb (1984) theorized one of the first inventories for learning styles called "Learning Styles Inventory", which is used in research to provide learning styles for individuals. However, Garner (2000), assembles limitations to this theory, such as statistical insignificant results. Kolb underlines his work with Jung (1977) however, only uses the theory partly, by focusing on the four main personality traits instead of the subtypes, thus, affecting reliability of research using Kolb LSI (Learning Style Inventory), Garner reported Kolb could only find weak or no correlations when using ILS and Myers Briggs Type inventory.

Sternberg and Grigorenko (2001) define Learning styles as a consistent, habitual way of learning over one's lifetime and incorporating many areas of life. (Sharp, 2012). Houver (2013) sees L.S. as an adaptable process function in particular times of need. Theorists have identified four mains Learning styles, auditory, visual, read/write and kinesthetic based on Kolb's experiential Learning Theories (Cassidy 2004), (Pashler et al., 2009) L.S. models incorporate information processing (Schmeck et al., (1997). Following on with careful, reflective, and in-depth thinking coupled with classes, lectures and notes help students internalize and remember content long term.

Learning theories based on environmental influences such as reinforcements, associations, observations, rewards, punishments, and consequences have been influenced by Classical Conditioning (Pavlov, 1897) and Operant Conditioning (Skinner, 1948). According to Rehman et al., (2023) stimuli / response process in Classical theories present the easiest and most direct form of learning. Staddon and Cerutti (2003) claim Skinner's (1963) work provided invaluable insights to understand learning processes. In the 1950s learning theories moved from behavioral models to recognizing cognitive processing models (Ertmer & Newby, 2013). Bandura (2012) widens the concepts of how learning occurs (Schunk, 2019). Banduras Social Cognitive Theory (2012) is based on the effect observation of another modeling a desired action or behavior and its subsequent outcome, in social settings, has on the acquisition of skills and language (Bandura & Cervone, 2023) it also

maintains the importance of cognitive, environmental, emotional aspects in acquisition of learning and behavior (Bandura & Walters,1977). Bandura also believed the social aspect of learning played a compelling part in development of personalities and for this reason the present research is underpinned by Bandura's Social learning theory which is in line with the present studies aims and rational to consider the influences of personality on an individuals learning style. .

1.2. Intelligence and Learning Styles

Multiple Intelligence (M.I.) and Learning Styles (L.S.) have similar aspects however learning styles look at the way and methods learning is used, whereas MI looks at innate intelligence and abilities (Silver et al., 1997). Gardner and Hatch (1983) first espoused the concept of M.I and categorized into seven intelligences as Visual-Aesthetic, Bodily-Kinesthetic, Musical, Intrapersonal, Interpersonal, Linguistic and Logical-Mathematical (Morgan, 1996).

Gardener (1983) believes "intellect should be conceptualized as pluralistic" (Gardner, p. 2, 2020). Lichtenstein (2021) reported Gardner's concept as immensely beneficial because of expansion and recognition for all learners' individuality. Morgan (1996) argued Gardener's theory of Multiple Intelligence should include abilities, skills, and sensitivity instead of the brain having different thinking process for all seven intelligences (Plucker & Esping, 2014). Morgan (1996) believes MI theory can benefit students and teachers in the understanding of exam success and failure in the classroom (Plucker & Esping, 2014).

Performance in relation to ability is expected to improve with practice, however in terms of an outcome performance for L.S often depend on the task at hand (Riding & Peason, 1994). Silver et al., (1997) reported learning-style theorists accord individual personality traits central roles in understanding differences in learning

1.3. Personality Definition and Background

Freud (1913) is accredited as the first to study personality he believed personality had genetic origins and was developed and fixed in childhood. However, contrary to this theory, Erikson (1951/1987), supported personality's development throughout life. Adler (1930) considers early childhood to be most important.

Theorists believe identify stages of development through which humans can reach self-actualization as they age (Horney, 2013, Maslow, 1950, 1973, Jung, 1981).

1.4. Personality Traits

According to Millon (1996) personality is a mixture of characteristic and pervasive traits, learned and biological are expressed in a person's unique pattern of thinking, feeling, perceiving, behaving, and coping.

Soto (2018) describes personality traits (P.T.) as distinctive patterns individuals favor over an extended period, in thinking, feeling, and behaving. Trait psychology is entrenched on different outcomes of the trait scale based on a period and the situation individual's experience (Diener & Lucas, 2019, Michael & Shoda, 1995).

Trait scale models have been widely used in research such as the five-factor model, (Diener & Lucas, 2019). Costa and McCrae (1998) agreed with previous research on this model (Normas model, 1963) named each personality trait as Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism.

However, O'Connor & Paunonen (2007) reported the big five scale traits should be narrowed down to specific result, the traits consistent of this scale are said to be too broad to have any specific traits.

This investigation will focus on three personality traits, Agreeableness, Openness and Extraversion. Agreeableness personality trait, described as those who like sharing in group work, is helpful, co-operative, and interested in others' ideas and feedback. Openness describes those who like abstract concepts, are imaginative, curious and like challenges. Extraversion is a trait described by people who like talking, excitement, being sociable and sharing feelings and emotions.

1.5. Literature Review

Within Classical Psychology both Personality Traits and Learning Styles have been widely researched as individual components (Rayner, 2001). Fryling et al., (2011), contends both variables are linked within Classical Psychology. However, research involving both constructs together are limited (Ibrahimoglu et al., 2013). The first study conducted with both Personality Traits and Learning Styles was Furnham (1992). He found a significant relationship between Learning Styles of Honey & Mumford (1982), Whetten & Cameron (1984), Kolb (1976) and Eysenck's Personality Theory (Matthews, & Gilliland, 1999). Interest in gaining knowledge on

the positive relationship between both topics has grown in research (Komarraju et al., 2011, Ibrahimoglu et al., 2013 & Hamdzah et al., 2022).

Furthermore, Siddiquei & Khalid (2018), conducted a study of 144 students were being enrolled into an e-learning course. It was reported certain variables of the big five scales were positively correlated to the ILS model (index of learning style); extraversion, had significant relationship with all types of learning styles additionally, neuroticism, related negatively with four learning styles. The GPA (Grade point average) of the participants had a positive correlation with three personality traits and had a negative correlation with neuroticism. Following this result, the participants' GPA was positively correlated with three learning styles (Siddiquei & Khalid, 2018).

Abouzeid et al., (2021), consisted of 333 undergraduate first year medical students. Both models from personality (Big five model) and the learning style model (VARK) were used as a cross sectional study. The most popular learning style reported was Kinesthetic learning. A significance between males and females on the types of learning styles was found, following on, results of a significance in kinesthetic and openness where found. Furthermore, academic achievement had a non-significant relationship with any personality traits. The researchers concluded learning styles could influence academic achievement; however P.T. did not have a significant difference. (Abouzeid et al., 2021).

Seyal et al., (2019), based research for a correlation on personality (Big five model) and the learning style model (VARK) was used. Extraversion and learning style (visual, aural, read/write or kinesthetic) showed no relationship. However, there was a correlation between Openness and Agreeableness with kinesthetic learning. The results of this research suggest Consciousness P.T. has a correlation with reading L.S. There was a correlation found between Neuroticism and Visual L.S. The research suggested knowledge of L.S. could encourage educators to develop effective teaching methods with learning rewarded, contrary to traditional teaching and learning styles focusing on classroom environment (Seyal et al., 2019).

Komarraju et al., (2011), studied 308 undergraduate students using the Five-Factor Model (1991) (Openness, Agreeableness, Consciousness, Extraversion, Neuroticism) model and the Inventory of Learning Processes (Schmeck & Ribich, 1978). Consciousness and Agreeableness reported a positive significance with all four of the learning processes. A negative significance was found between neuroticism and learning style types. However, a positive significance was found in Openness and Extraversion with elaboration processing. P.T. and L.S. were reported to have a relationship to academic performance. Openness and GPA (Grade Point

Average) from participants were studied by types of reflective learning styles. The main suggestion of the research paper encouraged intellectual interest can enhance academic performance. Future recommendations from this research are that students are encouraged to fuse both scholarly interests with information processing (Komarraju et al., 2011).

However, research has shown certain limitations Kamarulzaman (2012) reported insignificant affect of the big five personality variables towards Kolb's L.S. Implying both teachers and students should incorporate multiple L.S. in the education process (Ayub et al., 2023).A meta-analysis on cognition and personality was conducted by (Stanek & Ones, 2023) followed on to be analyzed by Erdman (2023) involved 2 million participants from 50 countries, 97 learning styles and 79 personality traits were investigated and while a strong positive relationship between cognitive abilities and Openness was found there was also considerable relationships found with other learning styles and personality traits.

1.6. Gap in Research

The review of the literature has shown a trend in investigation involving L.S. and P.T. This study will add evidence to the already existing literature in relation to how to support L.S. considering these specific P.T. Previous research outlines the use of long instruments which could cause dropout rate within the study as the length in time could limit participation success rate.

Further research will help understand the significance of personality traits and certain learning preferences. The present study aims to gain knowledge through correlation on three personality traits (Agreeableness, Openness, Extraversion), four learning styles (Kinesthetic, Aural, Reading/Writing and Visual), with the objective to provide a descriptive result. The present study will use an online form from Microsoft forms consisting of the Big Five Scale and the VARK questionnaire. Cattell (2009) highlights the lack of research and information would be valuable in guiding people interactions existing between learning styles and personality traits. Cattell (2009) believes there is not enough knowledge regarding this, "Surely it would be of great interest and utility to know what temperamental and other general personality trait elements usually go with, say, mathematical, verbal, practical and artistic abilities" (Cattell, p.160, 2009).

1.7. Research Question

Is there an association between learning style models and individual personality type?

1.8. Hypothesis

H1. There will be a significant association between Openness (low, moderate, high) and types of learning preferences (Multi model and Single model) for the participants.

H2. There will be a significant association between Agreeableness (low, moderate, high) and learning preferences (Multi model and Single model) for the participants.

H3. There will be a significant association between Extraversion (low, moderate, high) and learning preferences (Multi model and Single model) for the participants.

METHOD

Method

2.1. Design

The present study employed an online quantitative, correlation design. Independent variables persist of personality traits; Openness, Extraversion and Agreeableness (k=3; low=1, moderate=2, high=3). Dependent variable is learning style preferences divided into two groups (k=2; Single model and Multi model). As sample size in the current study was too small (N=150) it was unable for division of 5 groups Unimodal, Bimodal, Trimodal, Quad model and Multimodel, (Daoruang et al., 2019). The methodology was conducted on Microsoft forms.

2.2. Participants

The Department of Technology and Psychology Ethics Committee (DTPEC) from the institute of Art Design and Technology (IADT) approved the study before the researcher could commence the current study (Appendix A). The study is in accordance with the ethical standards as stated by Psychology society of Ireland (PSI) and (DTPEC). An online questionnaire originally gathered 154 participants from convenience sampling via an online link through open social media and messaging platforms. However, 4 participants had to be removed for the statistical analysis to be supported. N= 150; 35 men (23.3%) and 115 women (76.7%) (Appendix B).Age ranged from 18 and older. The study participants were provided with the Information Sheet (Appendix C), and Consent form (Appendix D),

2.3. Apparatus

Data for the current study was transferred from Microsoft forms into IBM SPSS version 29. Microsoft forms included an Information sheet and Informed Consent was added. The information sheets included in Microsoft Forms outlined the current study's nature, aims, relevancy of completing correctly, personal data

storage and anonymity and withdraws terms for the current study at any time throughout the study. The consent form informed the participants of relevant contact information and agreement of consent for participation. Demographic questions were sought from the participants, gathering information about age, gender, and education levels (Appendix E).

Following completion of the scales, the debrief was presented to ensure full understanding of the current study, thank you for participation, final agreement of data usage and relevant contact information. The current study utilized two scales; the Big Five Inventory (Appendix F) and VARK questionnaire (Appendix G).

2.4. Big Five Inventory (BFI)

The Big Five Inventory (John & Srivastava, 1999) is a 44-item questionnaire. It has five dimensions of personality traits including (Extraversion, Agreeableness, Consciousnesses, Openness and Neuroticism). However, the current study focused on three main personality traits, Extraversion, Agreeableness and Openness. It was agreed not to use neuroticism and consciousnesses due ethical considerations. Extraversion had 8 items, Agreeableness and Openness both had 9 items. The respondent's answers were collected on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). All responses to the questions added together by normal scoring or reverse scoring. The answer sheet has high scores of 36 and above, this changes with diverse types of personality traits each personality trait was then categorized into three groups, low, moderate, and high (Appendix F). Cronbach's Alpha ($a = .772$)

2.5. VARK Online Questionnaire 8.01

The second scale used in the study was the VARK (Fleming & Mills, 1992) Visual (V), Aural (A), Read/write (R) and Kinesthetic (K) questionnaire (Appendix G). The scale consists of 16–item scales and each answer reflects the participants' preferred learning style. Each question has four answers each, participants can choose one or more answers per question. Sample questions from this questionnaire consist of "When choosing a career or area of study, these are important to me." Score answers through VARK categories "mild visual.". Each answer relates to a particular sensory modality preference (Visual, Aural, Read/Write or Kinesthetic). The modality that receives the highest marks is the individual's preferred sensory modality. Questions describe situations in daily life, relating to individual's learning experience. Learning preferences are categorized as

Unimodal (V, A, R, or K), Bimodal (VA, VR, AR, VK, AK, and RK), Trimodal (VAR, ARK, VRK, and VAK), or Quadmodal (VARK). Each participant is categorized within one of these groups.

2.6. Pilot study

The pilot study was conducted through Microsoft forms the participants consisted of N=4. The pilot study was conducted to trial and confirms the procedure is clear of any errors. Estimate the required time for the study. In the pilot study the average completion time was 6 minutes.

Changes occurred in the pilot study where; personalizing the consent form to the present study. The final consent box was added for participants to agree for the use of data for the current study. Changes to the unique ID for the participants were made. Originally the ID code was only the second letter of first and second name. However, it seemed this could cause repetition in ID names and cause implications for unique ID. The researcher recommended participants to add three random numbers after the initials. The title presented in the pilot study was changed for the final form, participants agreed the original title was too broad, and people misunderstood the study's aim.

2.7. Procedure

Once the critique of the pilot study was completed the current study could begin. Participants were recruited through convenient sampling. Microsoft Forms was used for the collection of data. The participants were presented with an online link in Microsoft forms and were introduced to the information sheet to explain the nature and valuable information about the data collection. Following with the Informed Consent followed for agreement of participation. Demographic questions were presented for the participants to complete (Appendix H) to allow understanding the descriptive statistics of the sample size to clearly represent the wider population. After demographic questions were completed, the participants were given an option for their answers to be used within the current study. All participants were reminded of their anonymity throughout the study.

The participants were introduced to an access link for VARK.com website that presented them with 16 questions. The participants were given an overall answer when they completed the VARK questionnaire, then returned to the Microsoft forms where an answer box was presented. The participants selected the answer given

on the VARK website (VARK Learn Limited, 2023). Following on, the participants were presented with the BFI questionnaire consisted of 27 items. Debrief was presented to the participants at the end of the study which included a personal thank you message from the researcher for participating in the current study and gave support helpline contact information if any participant was affected by the current study. Contact information about the researcher was provided in the debrief. Finally, the participants had a final consent box to agree upon their data be used in the study.

RESULTS

Results

3.1. Overview

The present study aimed to examine the association between learning style preferences and personality types. The data was analyzed through IBM SPSS Version 29. A Chi Square of Independence was conducted with a sample size (N=150). The independent variables were Agreeableness, Extraversion and Openness with three levels (K= 3;Low, Moderate and High). The dependent variable is VARK learning style preferences with two levels (K=2; Multimodal (more than one learning style preference) Single modal (one main learning style preference). Participants were categorized by their VARK learning style preference.

3.2. Descriptive Statistics

Table 1 below demonstrates summary data of both learning styles (Single model and Multi model) and the three personality traits (Openness, Agreeableness and Extraversion) and Gender (Man and Woman). The mean and standard deviation reflects the relationship between both variables.

Table 1

Mean and Standard Deviation for Independent variables and Dependent variable.

Descriptive Statistics

	N	Mean	Std. Deviation
OpennessGroups	150	2.3333	.58696
ExtraversionGroup	150	1.7067	.55013
agreeablnessGroups	150	2.3400	.60011
What was your overall VARK result2	150	1.62	.487
Valid N (listwise)	150		

3.3. Inferential Statistics

Chi square of independence was conducted to show an association between Learning Style Preferences and Agreeableness, Openness and Extraversion. Alpha level conducted was .05. The reliability test was conducted for the BFI (Big Five Inventory) scales ($a = .772$) (Appendix K). Reliability test for VARK questionnaire could not commence (Leite et al, 2009).

3.4. Assumptions

Before conducting Chi Square of Independence, assumptions for this test had to be supported. Two categorical variables where supported, personality traits where first categorized in low, moderate, and high groups and VARK learning style preferences were divided into two main groups (2= Multi model and 1= Single model). Both variables had two or more categories. Each variable had independence of observation. Over 80% of cells had over 5 participant's one type of gender "prefer not to say" had to be removed to support this assumption (McHugh, 2013).

3.5. Pearson Chi Square of Independence

Person Chi Square test of Independence was conducted in the current study to investigate and association between learning styles and personality traits. Personality traits where categorized individually with three groups (Openness, Agreeableness and Extraversion) with three levels (k=3) (low=1, moderate=2, and high=3) and VARK learning style preferences categorized into two groups (k=2), (1= Single model and 2= Multi model). The current study conducted additional Chi Square of Independence against gender with the independent and dependent variables to increase any statistical reporting for future research.

Pearson Chi square of Independence between VARK and Openness

Pearson Chi Square test of Independence between VARK and Openness (2x3). Moderate Openness personality trait scored the highest between both single and multi model learning preferences, followed by high trait of Openness in both learning style preference groups (Table 2). Pearson chi square of independence showed a non-significant association between Openness groups (k=3) (Low, Moderate and High) and VARK learning style preferences groups (k=2) (Multi model and Single model) (2,150) =1.588, p>.05 (Appendix L). Phi and Cramer's V cannot be conducted with non-significant values. Therefore rejected **H1;** There will be a significant association between Openness and learning preferences for the participants based on the model of learning preference.

Figure 1. *Bar Graph representing Chi Square for Openness and VARK Learning Preferences*
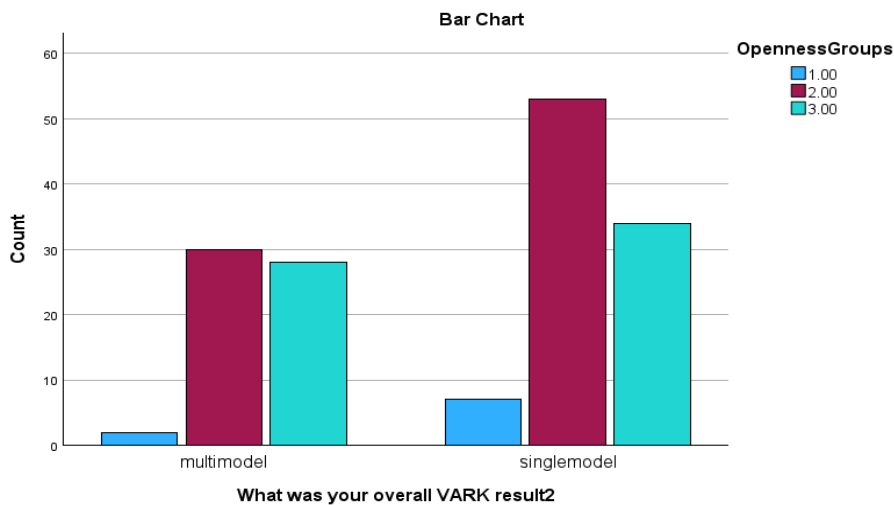
Pearson Chi Square of Independence between VARK and Agreeableness

Pearson Chi square of Independence between VARK and Agreeableness (2x3). Moderate Agreeableness is the most popular personality trait between both learning style preference groups. Followed by high level of Agreeableness personality trait (Table 3). Chi Square of Independence showed a non-significant association between Agreeableness (k=3) (Low, Moderate, High) and VARK learning style preference (k=2) (Multi model and Single model) (2,150) =1.588, p>.05(Appendix M). Phi and Cramer's V cannot be conducted with non-significant values. Therefore, Reject H2; there will be a significant association on Agreeableness and learning preferences for the participants based on the model of learning preference.

Figure 2. *Bar Graph representing Chi Square for Agreeableness and VARK Learning Preferences*

Pearson Chi Square of Independence between VARK and Extraversion

Pearson Chi Square of Independence between VARK and Extraversion (2x3). Both groups of VARK learning style preferences (Single model and Multi model) scored highest in moderate level of Extraversion personality type followed by low level of Extraversion (Table 4). Pearson Chi Square of Independence reported a non-significant association between Extraversion personality trait groups (Low=1, Moderate=2, High=3) and VARK learning style preference groups (k=2) (Multi model and Single model) (2,150) =1.759, p>.05 (Appendix N). Phi and Cramer's V cannot be conducted with non-significant values. Therefore, reject H3; There will be a significant association on Extraversion and learning preferences for the participants based on the model of learning preference.
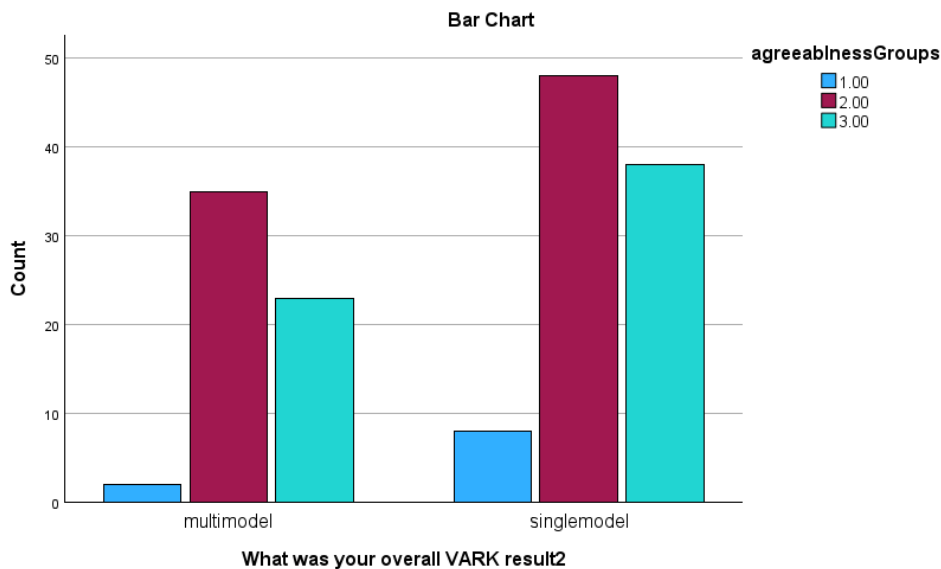
Figure 3. *Bar Graph representing Chi Square for Extraversion and VARK Learning Preferences.*

Pearson Chi Square of Independence between Gender and Extraversion

Pearson Chi Square of Independence between Gender and Extraversion (2x3) was conducted to see if there was any further significant association within the variables. Men and Women both scored highest in moderate Extraversion personality trait (moderate=2), followed by low Extraversion (low=1) (Table 5). Pearson Chi Square of Independence reported a non-significant association between Extraversion personality trait groups (Low=1, Moderate=2, High=3) and Gender (k=2) (Man and Woman) (2,150) = 3.314, p>.05 (Appendix O). Phi and Cramer's V cannot be conducted with non-significant values.

Figure 4. *Bar Graph representing Chi Square for Extraversion and Gender*
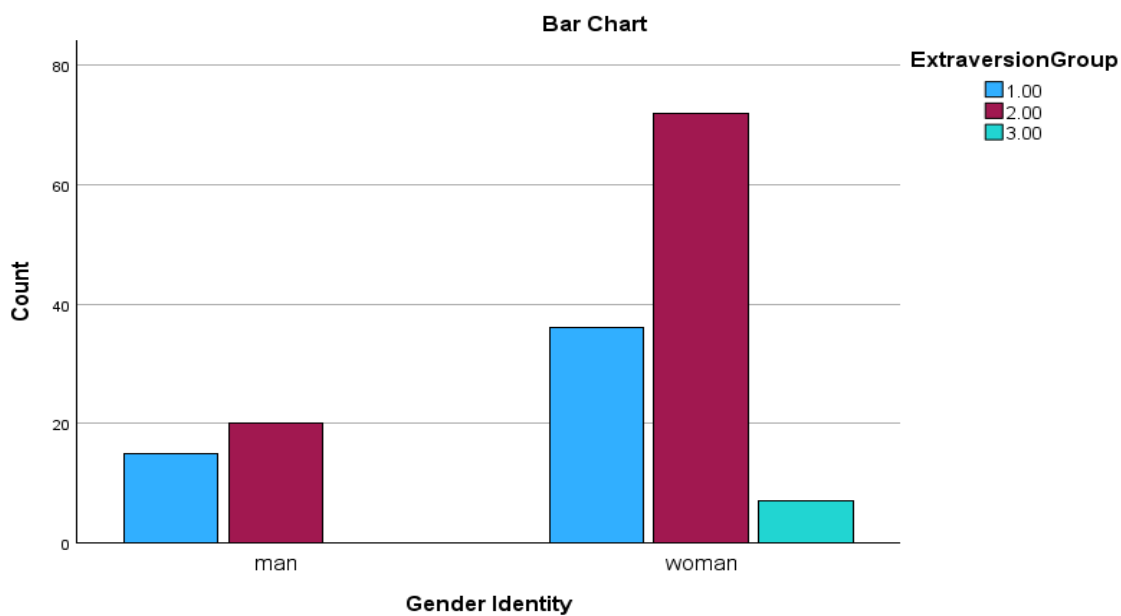
Pearson Chi Square of Independence between Gender and Agreeableness

Pearson Chi square of Independence between Gender and Agreeableness (2x3). Moderate Agreeableness is the most popular personality trait between both genders. Followed by high level of Agreeableness (Table 6). Chi Square of Independence showed a significant association between Agreeableness (Low=1, Moderate=2, High=3) and Gender (Man and Woman) (2,150) =6.002, p =.05(Appendix S) Phi and Cramer's V showed a weak association of .2 (Appendix P).
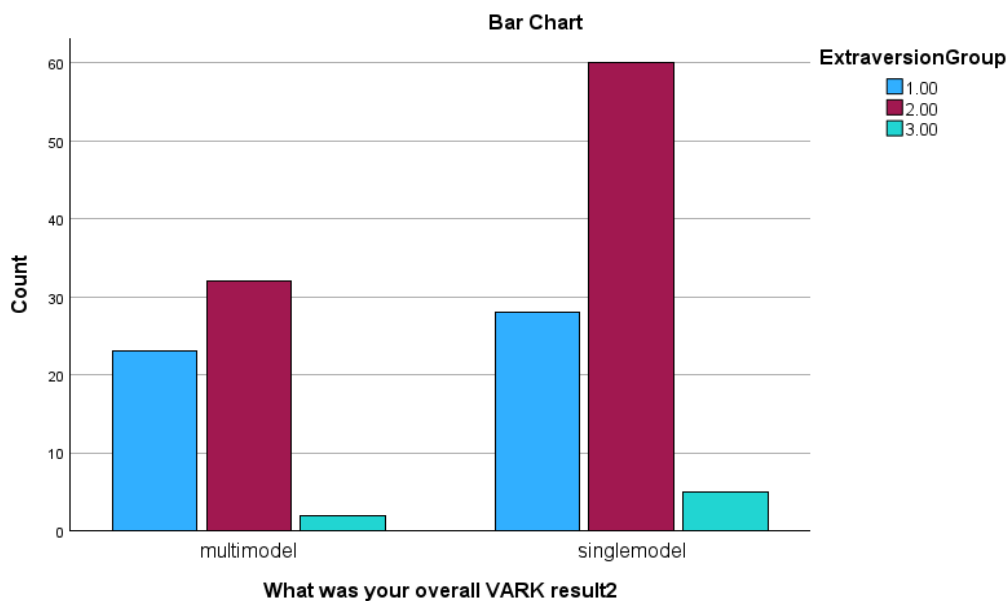
Figure 5. *Bar Graph representing Chi Square for Agreeableness and Gender*
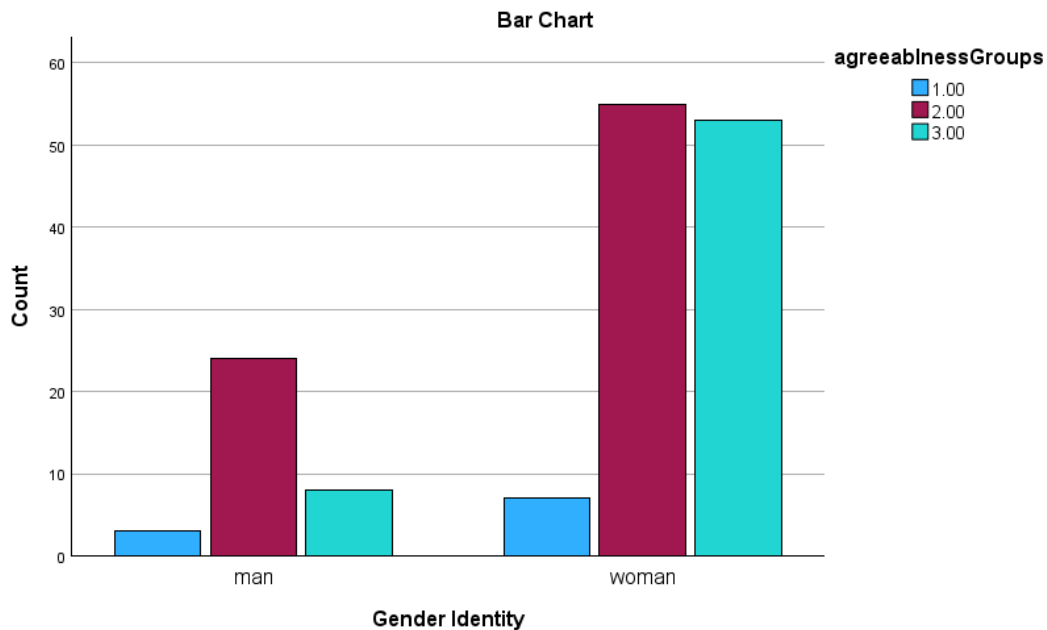
Pearson Chi Square of Independence between Gender and Openness

Pearson Chi Square test of Independence between Gender and Openness (2x3). Moderate Openness personality trait scored the highest between both genders, followed by high trait of Openness (Table 2). Pearson chi square of independence showed a non-significant association between Openness (Low= 1, Moderate= 2 and High=3) and Gender (Man and Woman) (2,150) = 1.312, p>.05 (Appendix Q). Phi and Cramer's V cannot be conducted with non-significant values.

Figure 6. *Bar Graph representing Chi Square for Openness and Gender*
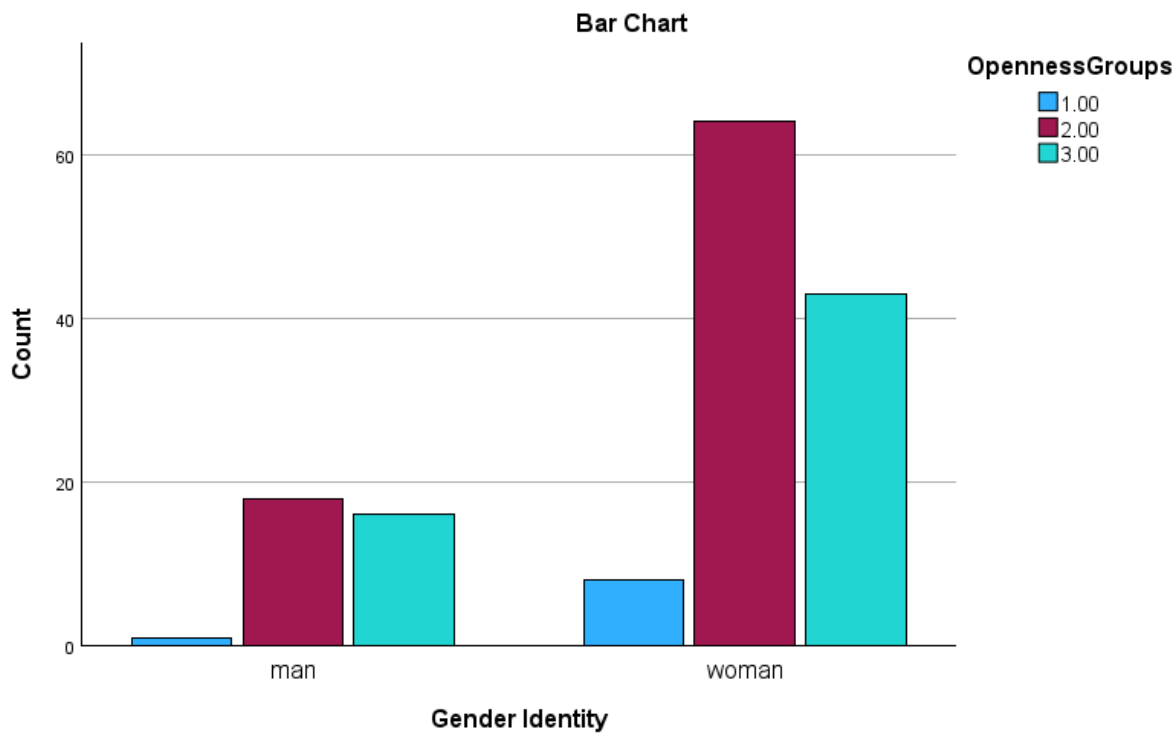
3.6. Summary of Results

Pearson Chi Square test of Independence was conducted to determine whether there is an association between single model learning preferences and multi modal learning preferences based on personality traits. Results from the present study indicated no significant association between any of the independent variables and dependent variables.

There was a significant difference between Agreeableness (Low, moderate and high) and Gender (man and woman). However, there was no significant difference between any other independent variable against Gender.

DISCUSSION

Discussion

4.1. Overview of Findings

The current study aimed to investigate an association on personality traits and learning styles within gender differnces. The current studyassesed whether there was an associationbetween VARKLeanrning Styles divided into two groups (Multimodel and Singlemodel) (Vark Learn Limited, 2023) and three of the Big Five Inventory personality traits (John & Srivastava, 1999) including Agreeablness, Openness and ExtraverionIn line with previous research no significant association had been found within the current study findings (Kamarulzaman,2012, Seyal et al, 2019).Previous research is largely focused on learning styles catagoriesed into strictly four groups,Visual, Aural, Kinesthetic or Read/Write (Seyal et al., 2019).There is little research covering learning styles divided between single and multimodel learning style prefernces. Ahmed et al., (2013) focuses on the 5 catagories (Unimodel, Bimodel, Trimodel, Quadmodel and Multimodel).As the sample size was too small to catagories into these five groups the current studycatagorised the learning style prefernces into two groups. This adustment widened the window for future research for this scale. All hypotheses of the current study where rejected the alternative hypothesis. However, descriptive statistics showed different learning style prefernces scores on personality types, for example; Moderate Agreeableness is scored the highest between both learning style prefernces

4.2. Interpretation of Findings

H.1 hypothesis did not have a significant association from the Chi Square of Independence result. As Chi Square assumption of cell numbers wasviolated this may have caused for implication of the results. However, it uncovered which personality scored highest and lowest in comparison to the VARK learning style preferences, which can influence and assist future research. VARK learning style preference questionnaire provided its own scoring method online, the researcher was only provided with the overall answers. This stopped any reliability testsdone on this questionnaire in the current study. VARK questionnaire had reliability of 0.85 for Visual questions, 0.82 for Aural questions, 0.84 for Read/Write questions and 0.77 for Kinesthetic,(Leite et al, 2009) all of which could have caused implications to the final statistical ananlysis for the Chi Sqaure of Independence. H2. Hypothesis did not have a significant association with the Chi Square of

Independence results. As reported in H1. Less than 20% of cells had a violation of 5 participants. However, the analysis resumed as there was a high sample size (N=150).

H3. Predicted there would be an association between VARK learning style preferences and personality traits (Openness). This hypothesis had non-significant results from the Chi square of Independence. Abouzeid et al (2021), reported Openness trait was significantly correlated to two different personality traits (Extraversion and Agreeableness) and two different learning styles (Visual and Kinesthetic).Participants who reported higher openness personality trait enjoy new experiences and learning new things.

4.3. Strengths of the study

Strengths of the study where the materials where consistant overtime. VARK questionnaire wasvery broad and allowed for a multituide of answers. The researcher conducted less scoring in Excel microsoft as VARK.com conducted the each answer for the particpant automatically. The BFI questionnaire has remained consistent throughout research and it has been heavily researched throughout history. Sample size gave appropriate internal validity with a diverse range of age and gender which can have a stronger represenmtation of the wider population.

4.4. Limitations of the Study

The present study used the VARK online questionnaire(VARK Learn Limited, 2023), includes up to 25 possible learning style prefernces which made the statisical anaylis complex to group particpants into normally distributed groups. However, the current study agreed upon dividing the learning style prefernces into two groups including Multimodel and Singlemodel learning preferences.
Another limitation emcountered in the present study was the VARK questionnaire (VARK Learn Limited, 2023),had little instructions onthe use of the questionnaire and made it difficult toconduct a reliable online form. The researcher had withdrawn the first online microsoft forms holding 84 participants answers as it had a missing answer box which was necessary for the VARK questionnaire.
Three personality traits from the Big Five Invetory (John & Srivastava, 1999)where permittedbe used due to ethical considerations towards the participants psychological and emotional well being and prevent any distress for the participants.

Reliability of the VARK questionnaire could not be conducted as the scoring method is done automatically in online (VARK.com). Leite et al (2009),reported a relaibility test based on conformatory factor anaylsis, which was also cited by the VARK.com website (VARK Learn Limited, 2023), presenting reliability scores for each subscale, Visual (.85), Aural (.82), Read/Write (.84) and Kinesthetic (.77). However, (Tomićet et al, 2023) conducted a literature review analysis on past research papers on the VARK questionnaire results indicted valid reliablity as a questionnaire, and highlighted theawareness of other factors such as demographic factors could influence statistical results..

4.5. Future Research

Future research is influenced by the results reported from the current study. Future research should aim to control for social desirability bias by observation study to find the strongest learning preferences. Instead of using different platforms for particpants to fill necessary questionnaires, researchers shouldhave all necessary scales on one platform for accesibilty and time effiecient for participants.
A longer measure for both learning style and personality traits will increase the reliability of the final results. Thus, an increase of sample size will encourge an appropriate reliability score, equality of distribution and statistical power of the results.

4.6. Conlcusion

Overall the present study contributes to the understanding the assoctaion of learning style preferences from the VARK online questionnaire and three personality traits from the Big Five Inventory (Agreeablness, Openness and Extraversion). Using social media to gather particpants contributed to a wider range of participants which gave a the present study a more representable sample to the wider population. No hypothesis from the present study had a significant assoication, however they cannot be considered as wrong. The results from the present study added contibution to the previous research on the materials used and sample size that was gathered. There was a statisical significancc in Openness (low, moderate and high) and Gender (man and woman). The result indicated the need for additional research in the area of learning style prefernces and personality types within VARK questionnaire and catagorised personality traits. The use of VARK questionnaire should be additionally researched for clarity and reliability for future work.

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APPENDICES

Appendices

Appendix A

Ethics Approval

All data collection must be completed within these 2 calendar years. If this time lapses during the course of your project data collection then you must reapply for ethical approval.

16. If your project when conducted does not conform to the project as described in your ethics application then you may be subject to certain outcomes. Depending on the circumstances, these can include a reduction in grade, a capping of the project module grade at a 'C', receiving an 'F' grade on the module, and/or potential invocation of the IADT Student Disciplinary Procedures.

17. Occasionally students wish to conduct projects on highly sensitive topics which would not be suitable for primary data collection. In these cases the student can consider 'Green' route methodologies (e.g. analysis of existing datasets, completing a Rapid Structured Literature Review, or similar). Approval by the PEC for all projects relating to sensitive topics is dependent on an appropriate and willing supervisor being available for such projects, and on the student's recognition that their pursuance of such a project is not mandatory and that they voluntarily chose such a project. Students should ensure that they are familiar with the supports available to them (for example, the student counselling service) and should ensure that their actions follow relevant legal statutes and requirements at all times. In exceptional cases a student can cease work on projects on highly sensitive topics and prepare a new project idea, although this may result in the need for a deferral or leave of absence in some cases.

Section 0: For Completion by the Supervisor

I confirm that this application to the PEC by __Meabh reid_____ (student name) accurately reflects all of the ethical implications in the project.

Application type (tick all that apply for mixed methods):

Green Route _____

Amber Route _✓____

Red Route _____

Signed _____   Date: _____

Section 1: Project Information

Student Name: Meabh Reid_____

Student Email Address: N00201097@iadt.ie_____

Supervisor Name: Eva Garcia_____

Working Project Title: correlations between personality traits and learning styles_____

Main Variables Being Investigated: personality traits (agreeableness, extraversion and openness) and lerning styles (visual, aural, read/ write and kinesthetic) _____

Instructions:

1. Please read all sections carefully, include all of the information relevant to your project, and include all necessary appendices.
2. All students must complete Sections 1, 2, 3, and 4. You will also need to complete at least one other section, depending on the type of research that you plan to do.
3. Email the completed form to your supervisor for approval.
    a. If your project is a Red route application then it must be submitted to your supervisor by **5pm on Monday 20th November 2023.**
    b. If your project is a Green or Amber route application then it must be submitted to your supervisor by **5pm on Monday 27th November 2023.**
4. Your supervisor will then complete Section 0 and will forward the application to the ethics committee.
5. If your application is under the Red Route, then you may also be required to submit four printed copies of your application (including all appendices). You will be advised closer to the deadline if this is necessary or not.
6. If your study changes from how you have described it in this form then you will need to reapply for approval from the PEC. The PEC does not guarantee that a revised project will be approved, even if the original project was approved.
7. All communication between students and the PEC will occur via the student's project supervisor.
8. The PEC will consider all of the information provided in the form when making their decision. **Incomplete forms (including forms which do not include all of the necessary Appendices) will be rejected.**
9. If the PEC's decision is that a revised application must be made then they will provide a list of required changes which are necessary to ensure participant wellbeing. Even if all of these are followed, the PEC makes no commitment to approve a revised application.
10. It is highly recommended that 'Red Route' students continue to formulate ideas for projects which fit the criteria for 'Green Route' and 'Amber Route' submissions until they are advised that their application has been approved. This is to ensure that the student can still complete the module, even if their 'Red Route' project does not receive approval from the PEC.
11. There is an obligation on the researcher to bring to the attention of the PEC any issues with ethical implications not clearly covered by the checklist in Section 6 of this form.
12. 'Signatures' may be typed, scanned in, or digitally signed.
13. The Psychology Ethics Committee can refuse any application which they consider unsuitable for student research.
14. Occasionally further information may be requested by the PEC with regard to Green and Amber route project applications where there is uncertainty regarding these applications. In some cases a Green or Amber route project ethics application may need to be reformatted and resubmitted as a 'Red' route application.
15. If you receive approval from the Psychology Ethics Committee to proceed with your research, this is valid for 2 calendar years from the date approval is issued by the PEC chair.

Section 2: External Agencies

Does your project involve recruitment from any external agency (e.g. a school, sports club, medical centre, voluntary organisation, or any other organisation outside of the IADT)?	Yes* ✓ .	No
* You must include a letter from a senior manager of each organisation stating that you have approval to collect data within that organisation. Include copies of each of these letters in the Appendices to your application. If the organisation has its own ethical review board (which is very common in some settings, such as hospitals), then you are also required to get ethical approval from that board prior to starting data collection, and to submit notice of this approval to your supervisor so that it can be forwarded on to the ethics committee. Some online forums also require permission to post requests for participants – make sure to check the relevant forum/organisation's code of conduct or terms and conditions. You do not need to include approval letters if you are conducting recruitment using mainstream social media routes (e.g., Twitter, Instagram, Facebook, Snapchat, TikTok) to your own followers, and/or snowball sampling/word of mouth recruitment.		

Section 3: Project Methodology – Please tick which type of project you are seeking approval from the PEC for. If your project involves mixed methods, then tick all which apply.

Route Type	Methodology	Tick here
Green Route (no direct contact with participants required, and no data is collected/recorded which could identify participants)	Theoretical paper / systematic literature review / Rapid Structured Literature Review (RSLR)	
	Novel analysis of an existing dataset gathered by another researcher or group which you are certain has abided by appropriate ethical procedures for the relevant discipline	
	Observation of participants in a public place in which they could reasonably be expected to be observed by strangers or in an online space which does not require users to log in to access.	
	Content analysis of material which is publicly available and does not require users to log in to access content.	
	Other method without direct contact with participants **	

Amber Route (direct contact with participants, but no additional ethical considerations beyond the minimum requirements)	Requirements gathering for and/or user testing of a prototype which is highly unlikely to cause any harm or distress to participants and which does not aim to collect data from a potentially vulnerable group	
	An experiment which is highly unlikely to cause any harm or distress to participants and which does not aim to collect data from a potentially vulnerable group	
	A survey/questionnaire design which is highly unlikely to cause any harm or distress to participants and which does not aim to collect data from a potentially vulnerable group	✓.
	An observational study which is highly unlikely to cause any harm or distress to participants and which does not aim to collect data from a potentially vulnerable group	
	Content analysis research which is highly unlikely to cause any harm or distress to participants and which does not aim to collect data from a potentially vulnerable group	
	Interviews and/or focus groups which are highly unlikely to cause any harm or distress to participants and which do not aim to collect data from a potentially vulnerable group	
	Other method which is highly unlikely to cause any harm or distress to participants and which does not aim to collect data from a potentially vulnerable group **	

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Red Route (direct contact with participants, including one or more project aspects which require special ethical consideration)	Requirements gathering for and/or user testing of a prototype which may cause harm or distress to participants and/or which involves collecting data from any potentially vulnerable group	
	An experiment which may cause harm or distress to participants and/or which involves collecting data from any potentially vulnerable group	
	A survey/questionnaire design which may cause harm or distress to participants and/or which involves collecting data from any potentially vulnerable group	
	An observational study which may cause harm or distress to participants and/or which involves collecting data from any potentially vulnerable group	
	Content analysis research which may cause harm or distress to participants and/or which involves collecting data from any potentially vulnerable group	
	Interviews and/or focus groups which may cause harm or distress to participants and/or which involves collecting data from any potentially vulnerable group	
	Any project which includes use of any illegal materials or substances as part of the materials for the study, regardless of methodology employed.	
	Any project which includes use of any dangerous materials or substances as part of the materials for the study, regardless of methodology employed.	
	Any project employing ethnographic or autoethnographic methodologies.	
	Other method which may cause harm or distress to participants and/or which involves collecting data from any potentially vulnerable group **	

** If you are using a methodology not listed above then provide a short description (fewer than 100 words) here:

Section 4: Checklist of Attached Appendices and Other Completed Sections

Applicable Project Ethics Route Colour Guide	Section / Item	I have attached this item/completed this section	I have checked with my supervisor and we have agreed that this item/section is not relevant to my project

	1	Section 1	✓·	▮
	2	Section 2	✓·	▮
	3	Section 3	✓·	▮
	4	Section 4	✓·	▮
	5	Letters of permission from any external agencies to be used for data collection	✓·	
	6	Statement of approval from ethical review boards in external agencies		✓·
	7	Section 5 (Green Route Projects only)		
	8	Section 6 (Amber and Red Route Projects only)	✓·	
	9	Section 7 (Amber Route Projects only)	✓·	
	10	Section 8 (Red Route Projects only)		
	11	Section 9 (Red Route Projects only)		
	12	Evidence of why you need to complete a Red Route Project (see note in Section 8)		
	13	Project Information Sheet (Red Route Projects only)		
	14	Project Consent Form (Red Route Projects only)		
	15	Project Demographic Questionnaire (Red Route Projects only)		
	16	All Other Questionnaires and Data Collection Materials (Red Route Projects only)		
	17	Project Debrief (Red Route Projects only)		

Section 5: Declaration of a Green Route project

I hereby declare that [all of / this aspect of (delete as appropriate)] my project involves no direct interaction between me and any research participants, and that having checked with my supervisor, that I do not need to seek informed consent from those whose data I use in my research. In addition, I will ensure that all data which I do gather is held in a manner which is compliant with GDPR, and will be deleted once it is no longer required (and definitely within 6 years of collection). At all times my study will be conducted in adherence to the ethical policies of the Psychological Society of Ireland and the British Psychological Society.

Student Signature: _____   Date: _____

Section 6: Confirmation of Adherence to Basic Ethical Principles for Amber and Red Route Projects

Complete the Table below with guidance from your supervisor. If you need to tick any of the 'red' boxes, then your project must be submitted under the 'Red Route'.

		Yes	No	N/A
6.1	I will describe the main research procedures to participants in advance so that they know what to expect. I will use the sample Information Sheet provided by PEC to do this.	✓·		
6.2	I will tell participants that their participation is voluntary.	✓·		
6.3	I will obtain written consent from participants using a 'tick' consent form which follows the current template provided by PEC prior to starting data collection.	✓·		
6.4	I will verify that participants still wish to include their data in online studies by including a final indicator of consent at the end of the questions.	✓·		
6.5	If my research involves content analysis or observation in any private or partially private setting then I will ensure to obtain informed consent prior to collecting data.	✓·		
6.6	I will explain to participants that they can withdraw from the study at any time and for any reason.	✓·		
6.7	I will ensure that participants know that they can refrain from answering any question that they don't want to, even if this is part of a psychometric scale.	✓·		
6.8	If using an online data collection method I will ensure that the only questions which require answers in order to proceed are the questions relating to providing informed consent, and I will ensure that participants are provided with an option which indicates that they do not give their consent.	✓·		
6.9	I will inform participants that their data will be treated with full confidentiality, and that, if published, it will not be identifiable as theirs.	✓·		
6.10	I will debrief participants at the end of their participation (i.e. give them a brief explanation of the study, whether or not deception was involved) following the current template provided by PEC	✓·		
6.11	I will obtain passive consent from parents/guardians for studies involving people aged between 16 and 18 years, as well as active consent from the participant and their school/organisation			✓·
6.12	I will obtain active consent from parents/guardians for studies involving people aged under 16 years. Where feasible I will also obtain active consent from the participant themselves. I will ensure that the parent/guardian or their nominee (e.g. a teacher) will be present throughout the data collection period.			✓·
6.13	I will ensure that my project supervisor has full access to the data that I collect and will only use data collection software which permits this.	✓·		
6.14	I will ensure that my project supervisor retains full rights to the data collected, including the ability to delete all data at any time, and that third-parties (e.g., software companies) will not 'own' the data collected.	✓·		

6.15	I will ensure that participants in studies involving Virtual Reality (VR) are not susceptible to extreme motion sickness or other physical conditions which may result in harm to the participants. I will ensure that a chaperone is present during VR sessions, and that the participant has the option of also having a nominee of their choosing present as well.			✓.
6.16	I will ensure that any equipment used in this study is cleaned and disinfected after each participant, and that appropriate hygienic barriers (e.g. masks) are used by all participants			✓.
6.17	Is there any realistic risk of any participant experiencing either physical or psychological distress or discomfort?		✓.	
6.18	I plan to use animals as part of my research study		✓.	
6.19	I plan to tell participants their results on a task or scale which I am using in my research.		✓.	
6.20	I am researching a sensitive topic which may cause some participants distress (such as, but not limited to, religion, sexuality, alcohol, crime, drugs, mental health, physical health, parenting, family relationships)		✓.	
6.21	One or more aspects of my study is designed to change the mental state of participants in a negative way (such as inducing aggression, frustration, sadness, etc.)		✓.	
6.22	My study involves deception or deliberately misleading participants in some way.		✓.	
6.23	My target population includes people who have learning or communication difficulties		✓.	
6.24	My target population includes patients (either inpatient or outpatient)		✓.	
6.25	My target population includes people in custody		✓.	
6.26	My target population includes people who may feel under personal or professional pressure to take part in my research (for example, close friends; family; employees or staff of managers or school principals who may support the research).		✓.	
6.27	My project includes the use of any illegal materials or substances as part of the materials for the study, regardless of methodology employed.		✓.	
6.28	My project includes the use of any dangerous materials or substances as part of the materials for the study, regardless of methodology employed.		✓.	
6.29	My project employs ethnographic or autoethnographic methodologies.		✓.	

Section 7: Declaration of an Amber Route project

I hereby declare that all of my project involves no risk of physical, emotional, social or cognitive harm to participants; that I will obtain full informed consent from all participants and provide a full debrief afterwards (using the templates provided); that I will provide full anonymity and/or

confidentiality to participants; and that my participants are not a potentially vulnerable population. In addition, I will ensure that all data which I gather is held in a manner which is compliant with GDPR, and will be deleted once it is no longer required (and definitely within 6 years of collection). At all times my study will be conducted in adherence to the ethical policies of the Psychological Society of Ireland and the British Psychological Society.

Student Signature: _____Meabh Reid_____Date: 24/11/2023_____

Section 8: Additional Information For Red Route Projects

8.1 What are the aims of your research? Include your research question and hypotheses for all studies which are not exploratory in nature (Max. 100 words)
8.2 What is the specific reason(s) why this is a Red Route project? (Max. 100 words)
8.3 How will you ensure that participants are not harmed as a result of participation in your research, given your answer to 8.2 above (Max. 100 words)
8.4 Why do you need to do this project at this stage in your career? For example, is there a specific postgraduate programme which you wish to apply for which requires you to have completed research in this area? Do you have specific additional qualifications or experience which equip you to manage the additional ethical implications in this project? Bear in mind that if your main reason for wishing to do this research is because the area of study is important then your application is likely to be refused – in general it is better for research with important societal implications to be conducted at a time when you have more research experience. (Max. 100 words)
8.5 Provide rationale as to why other methodologies related to your chosen topic (such as a systematic review, RSLR, theoretical paper, content analysis, or analysis of an existing dataset) cannot be done in your case (Max. 100 words)

8.6 List supporting documentation which you have included in an Appendix to this application to justify the need for you to do a Red Route project (this might be: the list of entry requirements for a specific postgraduate programme which you are planning on applying for, along with the link to the website where you found this information; a transcript or certificate for a training course related to the area; a letter from your manager or supervisor where you are engaged in voluntary work related to the area, etc.).

1.
2.
3.
4.
5.
6.

8.7 List below the final grades that you received in each module in your most recent completed year of study in IADT (i.e. Fourth year students should provide their 3rd year end-of-year results; Third year students should provide their 2nd year end-of-year results; MSc students should provide their grades to date in each module, 'provisional' grades are acceptable when final grades are not yet available). A Red Route ethics project requires a very high level of competence and attention to detail which we have found often correlates with higher grades in earlier modules.

1.
2.
3.
4.
5.
6.
7.
8.

8.8 Planned Study Design (Max. 50 words)

8.9 Description of Planned Materials (Max. 200 words). All materials should be included as Appendices to this application. Materials include information sheets, consent forms, debriefs, demographic questionnaire, attitude or psychometric questionnaires, intervention materials, score sheets, technical equipment, and anything else that will be used during data collection. If you intend to use a video/game/app/other media, then you must provide the committee with full access to this through a video file or access to the game/app/media.

8.10 Planned Participant Population and Recruitment Method (Max. 100 words)

8.11 Planned Procedure (Max. 100 words)

Section 9: Declaration of a Red Route project

I hereby declare that [all of / this aspect of (delete as appropriate)] my project involves no ethical implications other than those listed and described in Section 8. It involves no risk of physical,

Appendix B

Gender Descriptive

Gender Identity

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	man	35	23.3	23.3	23.3
	woman	115	76.7	76.7	100.0
	Total	150	100.0	100.0	

Appendix C

Information Sheet

Title of project: *Investigating the correlation between three personality traits (A, E, O) and learning styles in adults with an online survey.*

You are being invited to take part in the research to investigate if there is a correlation between three types of personality traits and a certain learning preference. This project is being undertaken by Meabh Reid for our major research project as part of the BSc (Hons) in Applied Psychology, IADT.

Before you decide whether you wish to take part, it is important for you to understand why this research is being done and what it will involve. Please take time to read this information carefully and discuss it with someone you trust. If there is anything that is unclear or if you would like more information please ask, our contact details are at the end of this information sheet. Thank you for reading this.

What is the purpose of the project?

Everyone on this planet is unique in their own way and our personality is one of the most unique to us. There is many different ways of learning in the general population. Putting both of these subjective qualities together aims to see if putting both together will help people excel in their learning capabilities.

Why are you being invited to take part?

You are being invited to take part in my study to improve wider knowledge of the aim of the present study. You are over the age of 18 which correlates with the criteria of the present study.

What is involved?

If you choose to participate, you will be asked demographic questions about your age and gender followed by two questionnaires, one questionnaire is on this form and the other one is on an outside source. When you have finished the second questionnaire it is important to remember your scores to fill them in back on this form. If you do not fill in your scores your data won't be counted. The study will take a maximum of 7 minutes to complete.

Do I have to take part?

You are free to decide whether you wish to take part or not. If you do decide to take part, you will be asked to sign a consent form that lets us know you have read this information sheet and understand what is involved in the research. You are free to withdraw from this study at any time and

without giving reasons.

What are the disadvantages and risks of taking part?

The questionnaires are about your personality type and your learning preference and there is a possibility that there will be questions that make you uncomfortable. You may decide not to answer these questions if you do not wish to.

What are the possible benefits of taking part?

We cannot promise the study will help you, but the information we get from the study will help to increase the understanding of the correlation of personality types and learning style preference.

How will my information be used?

Your responses to the questionnaire will be combined with all other participants' data and statistically analysed. No individual's data will be identifiable in the final report. The results of this analysis will be reported in the thesis for the BSc (Hons) in Applied Psychology in the Dun Laoghaire Institute of Art, Design & Technology. This can be requested through the library at IADT, or by emailing the researcher N00201097@iadt.ie or supervisor at eva.garcia-albarran@iadt.ie.This study may also be published in an academic journal article and may be written about for blog posts or media articles and these can be requested from the researcher.

How will my data be protected?

Under the EU General Data Protection Regulation (GDPR) the legal basis for collecting data for scholarly research is that of public interest. The regulations regarding the protection of your data will be followed. Only data which is needed for analysis will be collected. By giving your consent to take part in the study you are consenting to the use of your data as detailed in this information sheet.

The data will be retained by the researcher for at least one year, and may be retained for up to 7 years if the results of the study are published in certain capacities (e.g. in a journal article). There is also a possibility that the fully anonymised dataset may be submitted to a journal and made available to other researchers and academics worldwide for verification purposes, but if this occurs it will be ensured that you are not identifiable from the data.

As the supervisor on this project, I, Eva Garcia-Albarran am responsible for ensuring that all datasets will be stored in accordance with GDPR regulations and those which are not submitted to a journal will be fully deleted on or before 2032.

You will find contact information for IADT's Data Protection Officer, Mr Bernard Mullarkey, and more information on your rights concerning your data at https://iadt.ie/about/your-rights-entitlements/gdpr/

Who has reviewed the study?

This study has been approved by the IADT Psychology Ethics Committee.

What if you have any questions or there is a problem?

If you have a concern about any aspect of this study, you may wish to speak to the researcher(s) who will do their best to answer your questions. You should contact Meabh Reid N00201097@iadt.ie or their supervisor Eva Garcia-Albarran eva.garcia-albarran@iadt.ie.

Thank you

Thank you for taking the time to read the information sheet.

Date

25/ 01/ 2024

What is involved?

If you choose to participate, you will be asked demographic questions about your age and gender, followed by two questionnaires. The first questionnaire asks about your personality type, and the second about your learning style preference. The study will take approximately 7 minutes.

Do I have to take part?

You are free to decide whether you wish to take part or not. If you do decide to take part, you will be asked to sign a consent form that lets us know you have read this information sheet and understand what is involved in the research. You are free to withdraw from this study at any time and without giving reasons.

Appendix D

Consent form

If your study involves the recruitment of students or pupils you must explain that by choosing to either take part or not take part in the study will have no impact on their marks, assessments or future studies.

What are the disadvantages and risks (if any) of taking part?

Participants may choose not to answer any questions, or to take part in any section of the study if they do not wish to.

Consent Form

CONSENT FORM

Title of Project: *Investigating the correlation between three personality traits (A, E, O) and learning styles in adults with an online survey.*

Name of Researcher/s: Meabh Reid

Please tick box

Appendix E

Demographic Questions

Demographic Questions

Please provide us with an anonymised which we can use to identify yur data is you later wish to have it removed from our dataset. Please do so by answering the following two questions

6. What are the second letters of your first and last name? (For example, if your name is Jane Smith, these letters would be "AM"). and three random numbers to follow " 853". *

Enter your answer

7. Gender Identity *

○ Woman

○ Man

○ Prefer not to say

8. Age *

○ 18 - 24

○ 25 - 34

○ 35 - 44

○ 45 - 54

○ 55 and older

Appendix F

Big Five Inventory PDF questionnaire

BIG FIVE INVENTORY (BFI)

Reference

John, O. P., & Srivastava, S. (1999). The Big-Five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (Vol. 2, pp. 102–138). New York: Guilford Press.

Description of Measure:

44-item inventory that measures an individual on the Big Five Factors (dimensions) of personality (Goldberg, 1993). Each of the factors is then further divided into personality facets.

The Big Five Factors are (chart recreated from John & Srivastava, 1999):

Big Five Dimensions	Facet (and correlated trait adjective)
Extraversion vs. introversion	Gregariousness (sociable) Assertiveness (forceful) Activity (energetic) Excitement-seeking (adventurous) Positive emotions (enthusiastic) Warmth (outgoing)
Agreeableness vs. antagonism	Trust (forgiving) Straightforwardness (not demanding) Altruism (warm) Compliance (not stubborn) Modesty (not show-off) Tender-mindedness (sympathetic)
Conscientiousness vs. lack of direction	Competence (efficient) Order (organized) Dutifulness (not careless) Achievement striving (thorough) Self-discipline (not lazy) Deliberation (not impulsive)
Neuroticism vs. emotional stability	Anxiety (tense) Angry hostility (irritable) Depression (not contented) Self-consciousness (shy) Impulsiveness (moody) Vulnerability (not self-confident)
Openness vs. closedness to experience	Ideas (curious) Fantasy (imaginative) Aesthetics (artistic) Actions (wide interests) Feelings (excitable) Values (unconventional)

For more information about the Big Five, visit this website:
http://www.uoregon.edu/~sanjay/bigfive.html#where

Self Report Measures for Love and Compassion Research: *Personality*   Fetzer Institute

Scale:

The Big Five Inventory (BFI)

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please write a number next to each statement to indicate the extent to which you agree or disagree with that statement.

Disagree strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree Strongly
1	2	3	4	5

<u>I see Myself as Someone Who...</u>

____1. Is talkative

____2. Tends to find fault with others

____3. Does a thorough job

____4. Is depressed, blue

____5. Is original, comes up with new ideas

____6. Is reserved

____7. Is helpful and unselfish with others

____8. Can be somewhat careless

____9. Is relaxed, handles stress well

____10. Is curious about many different things

____11. Is full of energy

____12. Starts quarrels with others

____13. Is a reliable worker

____14. Can be tense

____15. Is ingenious, a deep thinker

____16. Generates a lot of enthusiasm

____17. Has a forgiving nature

____18. Tends to be disorganized

____19. Worries a lot

____23. Tends to be lazy

____24. Is emotionally stable, not easily upset

____25. Is inventive

____26. Has an assertive personality

____27. Can be cold and aloof

____28. Perseveres until the task is finished

____29. Can be moody

____30. Values artistic, aesthetic experiences

____31. Is sometimes shy, inhibited

____32. Is considerate and kind to almost everyone

____33. Does things efficiently

____34. Remains calm in tense situations

____35. Prefers work that is routine

____36. Is outgoing, sociable

____37. Is sometimes rude to others

____38. Makes plans and follows through with them

____39. Gets nervous easily

____40. Likes to reflect, play with ideas

____41. Has few artistic interests

Self Report Measures for Love and Compassion Research: *Personality*

Fetzer Institute

____20. Has an active imagination   ____42. Likes to cooperate with others

____21. Tends to be quiet   ____43. Is easily distracted

____22. Is generally trusting   ____44. Is sophisticated in art, music, or literature

Scoring:

BFI scale scoring ("R" denotes reverse-scored items):

Extraversion: 1, 6R, 11, 16, 21R, 26, 31R, 36
Agreeableness: 2R, 7, 12R, 17, 22, 27R, 32, 37R, 42
Conscientiousness: 3, 8R, 13, 18R, 23R, 28, 33, 38, 43R
Neuroticism: 4, 9R, 14, 19, 24R, 29, 34R, 39
Openness: 5, 10, 15, 20, 25, 30, 35R, 40, 41R, 44

Appendix G

VARK questionnaire

visual * aural * read/write * kinesthetic

VARK®
helping you learn better

The VARK Questionnaire (Version 8.01)
How Do I Learn Best?

Choose the answer which best explains your preference and circle the letter(s) next to it.
Please **circle more than one** if a single answer does not match your perception. Leave blank any question that does not apply.

1. I need to find the way to a shop that a friend has recommended. I would:
   a. find out where the shop is in relation to somewhere I know.
   b. ask my friend to tell me the directions.
   c. write down the street directions I need to remember.
   d. use a map.

2. A website has a video showing how to make a special graph or chart. There is a person speaking, some lists and words describing what to do and some diagrams. I would learn most from:
   a. seeing the diagrams.
   b. listening.
   c. reading the words.
   d. watching the actions.

3. I want to find out more about a tour that I am going on. I would:
   a. look at details about the highlights and activities on the tour.
   b. use a map and see where the places are.
   c. read about the tour on the itinerary.
   d. talk with the person who planned the tour or others who are going on the tour.

4. When choosing a career or area of study, these are important for me:
   a. Applying my knowledge in real situations.
   b. Communicating with others through discussion.
   c. Working with designs, maps or charts.
   d. Using words well in written communications.

5. When I am learning I:
   a. like to talk things through.
   b. see patterns in things.
   c. use examples and applications.
   d. read books, articles and handouts.

6. I want to save more money and to decide between a range of options. I would:
   a. consider examples of each option using my financial information.
   b. read a print brochure that describes the options in detail.
   c. use graphs showing different options for different time periods.
   d. talk with an expert about the options.

7. I want to learn how to play a new board game or card game. I would:
   a. watch others play the game before joining in.
   b. listen to somebody explaining it and ask questions.
   c. use the diagrams that explain the various stages, moves and strategies in the game.
   d. read the instructions.

8. I have a problem with my heart. I would prefer that the doctor:
    a. gave me something to read to explain what was wrong.
    b. used a plastic model to show me what was wrong.
    c. described what was wrong.
    d. showed me a diagram of what was wrong.

9. I want to learn to do something new on a computer. I would:
    a. read the written instructions that came with the program.
    b. talk with people who know about the program.
    c. start using it and learn by trial and error.
    d. follow the diagrams in a book.

10. When learning from the Internet I like:
    a. videos showing how to do or make things.
    b. interesting design and visual features.
    c. interesting written descriptions, lists and explanations.
    d. audio channels where I can listen to podcasts or interviews.

11. I want to learn about a new project. I would ask for:
    a. diagrams to show the project stages with charts of benefits and costs.
    b. a written report describing the main features of the project.
    c. an opportunity to discuss the project.
    d. examples where the project has been used successfully.

12. I want to learn how to take better photos. I would:
    a. ask questions and talk about the camera and its features.
    b. use the written instructions about what to do.
    c. use diagrams showing the camera and what each part does.
    d. use examples of good and poor photos showing how to improve them.

13. I prefer a presenter or a teacher who uses:
    a. demonstrations, models or practical sessions.
    b. question and answer, talk, group discussion, or guest speakers.
    c. handouts, books, or readings.
    d. diagrams, charts, maps or graphs.

14. I have finished a competition or test and I would like some feedback. I would like to have feedback:
    a. using examples from what I have done.
    b. using a written description of my results.
    c. from somebody who talks it through with me.
    d. using graphs showing what I achieved.

15. I want to find out about a house or an apartment. Before visiting it I would want:
    a. to view a video of the property.
    b. a discussion with the owner.
    c. a printed description of the rooms and features.
    d. a plan showing the rooms and a map of the area.

16. I want to assemble a wooden table that came in parts (kitset). I would learn best from:
    a. diagrams showing each stage of the assembly.
    b. advice from someone who has done it before.
    c. written instructions that came with the parts for the table.
    d. watching a video of a person assembling a similar table.

https://vark-learn.com

Appendix H

VARK link and answers on Microsoft forms

Correlation between Personality traits and learning styles.

* Required

VARK learning Preference

Please fill in the VARK Questionnaire using link and when you have your VARK result, return here.

https://vark-learn.com/the-vark-questionnaire/

VARK questionnaire is an external online learning preference style questionnaire. Results are given straight away fter filling out the questionnaire. The type of learning style that the VARK questionnaire cover are; Visual, Aural, Reading/wringing and Kinesthetic.

9. What was your overall VARK result *

○ Mild Visual

○ Strong Visual

○ Very strong visual

○ Mild Aural

○ Strong Aural

○ AK

○ RK

○ VAR

○ VAK

○ VRK

○ ARK

○ VARK

This question is required.

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Appendix I

Big Five Inventory Presented on Microsoft Forms

Correlation between Personality traits and learning styles.

* Required

Big Five Inventory

Here are a number of characteristics that may or may not apply to you. For example, do you agree
that you are someone who likes to spend time with others? Please choose one option on the Likert scale of the feeling you have on each statement given

10. I see myself as ... *

	strongly Disagree	Disagree	Neutral	Agree
Is talkative	○	○	○	○
tends to find fault with others	○	○	○	○
Is original, comes up with new ideas	○	○	○	○
Is reserved	○	○	○	○
Is helpful and	○	○	○	○

Is helpful and unselfish with others	○	○	○	○
Is curious about many different things	○	○	○	○
Is full of energy	○	○	○	○
Starts quarrels with others	○	○	○	○
Is ingenious, a deep thinker	○	○	○	○
Generates a lot of enthusiasm	○	○	○	○
Has a forgiving nature	○	○	○	○
Has an active imagination	○	○	○	○
Tends to be quite	○	○	○	○
Is generally trusting	○	○	○	○
Is inventive	○	○	○	○

v

Has an assertive personality	○	○	○	○
Can be cold and aloof	○	○	○	○
Values artistic, aesthetic experiences	○	○	○	○
Is sometimes shy, inhibited	○	○	○	○
Is considerate and kind to almost everyone	○	○	○	○

11. Question *

	strongly disagree	Disagree	Neutral	Agree
Prefers work that is routine	○	○	○	○
Is outgoing, sociable	○	○	○	○

Is sometimes rude to others	○	○	○	○
Likes to reflect, play with ideas	○	○	○	○
Has few artistic interests	○	○	○	○
Likes to cooperate with others	○	○	○	○
Is sophisticated in art, music or literature	○	○	○	○

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Appendix J

Final consent Box and Debrief

Correlation between Personality traits and learning styles.

* Required

Final Consent and Debrief

12. Having completed the questionnaire *

○ I consent to the researcher using my answers for their research

○ I wish to have my answers removed

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Debriefing Information Form

Title of Project: *Investigating the correlation between three personality traits (A, E, O) and learning styles in adults with an online survey.*

Name of Researcher/s: Meabh Reid

Thank you very much for taking part in this research study.

This study is designed to investigate if there is a stronger correlation between certain personality traits and learning style preferences. The results from this study will help people to understand that there personality could give an indicator of what type of learning style they have. It will help people who are finding it hard to learn in a certain way which will give them peace of mind. You can withdraw from the study at any time and your results wont be counted.

Withdrawal information
If you have any questions about this study, or if you would like to withdraw your data from the study, please contact the researcher or supervisor at N00201097@iadt.ie and eva.garcia-albarran@iadt.ie. In your email let them know your unique ID code; second letters of their name and last 3 digits of phone number. If you submit a request for data removal, all data collected from you will be securely deleted. You will be able to remove your data from the study until 04/ 03 / 2024 when the data will be combined and analysed. Data removal will not be possible after that date. Please keep a copy of this information in case you wish to remove your data after leaving this screen.

Data protection
Your data will be treated according to GDPR regulations. You will find contact information for IADT's Data Protection Officer, Mr Bernard Mullarkey, and more information on your rights concerning your data at https://iadt.ie/about/your-rights-entitlements/gdpr/

Support resources

If you have been affected by the content of this study in any way, the organisations below may be of assistance.

HSELive 1800-700-700

Bluebird care 015-686-701

Enable Ireland 01-8727155 email; hello@enableireland.ie

Thank you again for taking the time to participate in this research.

If you have any questions about this study, please contact the researcher or supervisor at at N00201097@iadt.ie and eva.garcia-albarran@iadt.ie.

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Appendix K

Reliability test for BFI

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.772	.787	27

Appendix L

Chi Square test for Openness(low=1, moderate=2, high=3) and VARK learning style preferences (single model= 1, multi model= 2)

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2.114[a]	2	.347
Likelihood Ratio	2.178	2	.337
Linear-by-Linear Association	2.053	1	.152
N of Valid Cases	150		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 3.42.

Appendix M

Chi Square for Agreeableness (low=1, moderate=2, high=3) and VARK learning styles (single model=1, multi model=2)

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.588[a]	2	.452
Likelihood Ratio	1.722	2	.423
Linear-by-Linear Association	.206	1	.650
N of Valid Cases	150		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 3.80.

Appendix N

Chi Square for Extraversion (low=1, moderate=2, high = 3) and VARK learning preferences (single model=1, multi model=2)

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.759[a]	2	.415
Likelihood Ratio	1.753	2	.416
Linear-by-Linear Association	1.713	1	.191
N of Valid Cases	150		

a. 2 cells (33.3%) have expected count less than 5. The minimum expected count is 2.66.

Appendix O

Chi Square of Independence Between Extraversion (low=1,moderate=2, high=3) and Gender (Man and Woman)

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.314[a]	2	.191
Likelihood Ratio	4.851	2	.088
Linear-by-Linear Association	2.759	1	.097
N of Valid Cases	150		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 1.63.

Appendix P

Chi square of Independence between Gender (man and woman) and Agreeableness (Low= 1, moderate=2, high=3)

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6.002[a]	2	.050
Likelihood Ratio	6.340	2	.042
Linear-by-Linear Association	4.927	1	.026
N of Valid Cases	150		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 2.33.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.200	.050
	Cramer's V	.200	.050
N of Valid Cases		150	

Appendix Q

Chi square of Independence Gender(man and woman) and Openness(low=1, moderate=2, high=3)

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.312[a]	2	.519
Likelihood Ratio	1.428	2	.490
Linear-by-Linear Association	1.202	1	.273
N of Valid Cases	150		

a. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 2.10.