Understanding the role of personality when learning accounting

Abstract

Personality type has been a focus of educational psychology researchers for decades. How does personality impact students when they embark on a university course? Suppose we can better understand the factors that influence a student's ability to engage with academic learning. In that case, we will be able to shape the way we teach to support students better. Using a survey, we asked a series of questions about students and learning accounting. Combining this data with that of the student's personality types, we find that age, cultural background, and language proficiency, may have more influence on academic performance than personality. Some personality traits, such as judgement are associated with higher effort, however, self-control and extrinsic motivation are more decisive predictors of academic success. The variations in effort based on gender, along with the unique behaviours exhibited by older and ethnically diverse students, highlight the need for customized, culturally responsive teaching methods and improved self-regulation support within higher education.

Key words: personality, accounting education, culture

1. Introduction

Our experiences shape our personality types (Asendorpf, 2002). The study of these differences is fraught with complications such as varied ways of measuring personality, and a general lack of understanding of exactly how personality is formed and subsequently shapes behaviour (Asendorpf, 2002; Vollrath, & Torgersen, 2000). However, it is important to try and unpack how personality impacts an individual's ability to make decisions while placed in situations of stress, such as learning a new discipline. Educational psychology researchers have studied personality type nuances to understand who our students are and better understand their learning process (Randall, Isaacson, & Ciro, 2017; Vollrath & Torgersen, 2000; Wheeler, Hunton, & Bryant, 2004).

This study aims to investigate the role of personality when learning accounting at university. Given the complexity of human behaviour, this study will focus on one setting, ie learning accounting. The study aims to better understand the role and influence of personality when taking a university-level accounting course. This is important for educators to have an awareness of how personality may impact their students, and this study will also add to the educational psychology literature as the field develops a better understanding of human behaviour within education. This study contributes to the extant literature by showing that while personality traits do not exhibit a strong direct relationship with performance, self-control and some cultural factors have a more significant role in shaping student performance.

We explore the different types of personality types within a cohort of 100-level accounting students at a large university in New Zealand. Through survey data, we measure the personality type of each student and collect demographic data such as age and gender. Then we ask a series of questions aimed at understanding other non-cognitive variables such as self-control (Tangney, Boone, & Baumeister, 2018), motivation (Dull, Schleifer, & McMillan, 2015) and learning approach (Duff*, 2004). By investigating these key variables and measuring academic performance, we can see how having different personality types may influence other non-cognitive variables that affect learning.

2. Literature review

2.1   Personality types

Humans are individuals. As a race, we are not uniform across our species, we each have our own experiences and genetics (nature and nurture) that enable us to have differences. Understanding these differences can be challenging given the broad range of variables and the almost countless combinations of personality types. To be able to group these variables with meaning and understand this complex phenomenon is challenging. One stream of personality research has been developed based on Carl G. Jung (1875-1961) and his personality theory. Jungian personality theory (Jung 2010) acknowledges that personality is a mediating and integrating factor for cognitive processes and it will influence how we deal with information, how we develop as an individual, and how the unconscious mind operates (Wheeler, Hunton, & Bryant, 2004). To be a functioning individual, there must be a well-developed system for both perception and decision-making (McCaulley, 1974). This field of research has examined the personality types of individuals within many different settings such as computer programming (Catherine, & Wheeler, 1994), learning mathematics (Hadfield, & McNcil, 1994), learning styles (Drummond, & Stoddard, 1992), and accounting education (Wheeler, Hunton, & Bryant, 2004). In their meta-analysis of over 200 papers that have investigated personality types, Randall, Isaacson and Ciro (2017, p1) state that the MBIT scale has "reasonable construct validity" thereby giving confidence to researchers continuing to explore this important and complex field.

One approach to understanding the different aspects of personality is through a dichotomous measurement of preferences known as the Myer's Briggs Type Indicator (MBTI). The MBTI has been used in research since Katherine Briggs and Isabel Briggs Myers started personality testing in 1942 using Carl Jung's seminal work as a base (Brownfield, 1993). This mother-daughter team developed a set of items that could be used to identify the attitudes, behaviours, perceptions, and feelings of those answering the questions. While no measurement of personality is perfect, the MBTI has been used in countless research projects since first developed (Randall, Isaacson, & Ciro, 2017) and is one of the more robust measures available at this time. Furthermore, Thompson and Borello (1986) showed strong factor pattern coefficients over 0.30 for the MBIT constructs. The Myers-Briggs Type Indicator has four categories that a respondent can be identified by. The first is an introvert-extrovert showing how the person is energised. Do they receive energy from other people or from being alone. The second is sensing-intuition showing what someone is paying attention to. The third category is thinking-feeling and shows how an individual is making their decisions. Lastly is

judgement-perception and this gives insight into the type of lifestyle that someone leads. These four categories create 16 unique combinations of personality "types". The MBIT measures personalities within four distinct dimensions: Introvert (I) – Extravert (E), Sensing (S) – Intuition (N), Thinking (T) – Feeling (F), and Judging (J) – Perceiving (P). After answering a series of questions, each individual is given a four-letter 'type' based on these dimensions (Harrington, & Loffredo 2010). All possible combinations of these four letters categorises people into 16 distinct varieties of personality. The first dimension Introvert (I) – Extravert (E), shows how people get their energy, either by being around other people (E) or by being alone (I). The Sensing (S) – Intuition (N) dimension refers to the gathering of information. Sensing types use their five senses to gather information, however, Intuitive types are more future-focused and have a more random process for gathering information (often looking at the big picture). Decision-making is reflected in the Thinking (T) – Feeling (F) dimension where thinkers are more objective and somewhat detached from decisions, whereas feelers often consider relationships and the impact on people from a decision. Finally, the Judging (J) – perceiving (P) dimension is about structure. Judging types need structure and a plan in place, whereas perceiving types are far more comfortable having flexibility and impulsiveness in their lives.

The MBIT has been used within education as a tool for a better understanding of both learning and teaching (Drummond, & Stoddard, 1992). Ehrman and Oxford (1990) found that within a high-pressure situation of intensive training, introverts, feelers, and perceivers were able to achieve higher scores on learning languages than other categories within the MBIT. McCaulley (1974) showed through an investigation of over 3000 university students that the use of "type" increases the power of prediction in educational research. She goes on to discuss that the "type" is not a static nor stagnant concept and that the ability to perceive and decide is both driven by personality type and will influence how people learn. In a study of teaching styles, Rushton et al., (2007) argue that understanding one's temperament and personality will aid teachers in recognising the complexities of students' differences. The better we can understand our students, the better we can support them as they learn.

2.2   Culture and personality

Where we come from shapes us. The environment in which we grow up and learn about values, ethics, norms, etc. will shape our decision-making. As such, personality, too, can be shaped by culture (Church, 2016). In a study of consumer behaviour, Rawwas (2001) shows that there are significant differences between choices that foreign nationals make compared to domestic ones.

Researchers in the 1920's and 1930's started investigating the concept of 'national character' to understand how people are shaped by the society around them (Hofstede, & McCrae, 2004). A popular textbook on social anthropology in the late 1960's defines the link between culture and personality in the following way:

> *Children, when they are born, are without culture, and hence are without personality, and almost without social relationships. The very fact of birth may be described as the termination of a biophysical relationship and, in the usual course of events, its replacement with a social relationship. Social relationships, then, expand with maturation; new culture is demanded in which to respond to other people so that the relationships are possible. The acquisition of that culture is ipso facto the growth of the personality. As the personality develops, the characteristic way of responding to given stimuli (some of the responses being universal, some culturally normal, and some eccentric) becomes more highly developed and, at the same time, more set. (Bohannan, 1963/1971 p. 20)*

2.3   Motivation, satisfaction, and effort

Many non-cognitive variables, such as effort, motivation, satisfaction, and self-efficacy have been shown to influence learning (Doménech-Betoret, Abellán-Roselló, & Gómez-Artiga, 2017; Moody, 1993; Schunk, 1995). Learning styles theory assumes that individuals have a set of predispositions that impact what learning strategies can be applied (Moody, 1993). In a study of students learning online, Shen, Cho, Tsai, and Marra, (2013) show that self-efficacy explains learning satisfaction. Bekele (2010) showed that motivation and satisfaction are associated with each other and that students use cognitive effort, persistence, and achievement levels to interpret motivation.

Some researchers have failed to draw a link between personality types and satisfaction. In a study of 204 real estate practitioners, no relationship was found between personality type and satisfaction when using web-based instruction (Kanuka & Nocente, 2010). Contrastingly, personality type and satisfaction were found to be associated in other studies (Cheng, Wu, & Su, 2021; Downs, 2019; Kim, 1999).

Understanding academic performance and what influences some students to achieve and others to fail is of great interest to educators and scholars alike. To be able to better understand why a student fails or succeeds provides insight so that support can be tailored to those learning. Duff, Boyle, Dunleavy, and Ferguson, (2004) found that 43.6% of the variance in academic performance can be explained by personality type. Supporting this, personality and learning

approaches were found to explain 40% of academic performance in another study (Chamorro-Premuzic & Furnham, 2008).

2.4 Learning Approach for Accounting

Accounting students are known to be strategic learners (Wynn-Williams, Beatson & Anderson, 2016). The strategic approach means that students are focused on what they need to learn (or memorise) to be able to pass the course and get the grade they seek. The focus is not on the actual learning, but the outcome of the grade they receive. This strategic approach means that accounting students act and make decisions regarding their study habits, and goals that are firmly focused on the grade outcome. Booth and Winzar (1993) show that Australian accounting students tend to be more sensation over intuition, thinking over feeling, and judgement over perception. In a study based in Iran, accounting students had a positive and significant relationship between personality factors of communication ability, with learning style and outcome (Baghoomian, Rajabdorri, & Khoramin, 2017). In a study of 99 accounting students McNeill and Collins (1975) showed that those with high autonomy had a greater chance of academic success.

3. Model specifications

From the literature, we propose the following models:

H1: $Motivation = \lambda_0 + \lambda_1 MBTI\_Traits + Control + \varepsilon$

H2: $Satisfaction = \lambda_0 + \lambda_1 MBTI\_Traits + Control + \varepsilon$

H3: $Approach = \lambda_0 + \lambda_1 MBTI\_Traits + Control + \varepsilon$

H4: $Effort = \lambda_0 + \lambda_1 MBTI\_Traits + Control + \varepsilon$

H5: $Performance = \lambda_0 + \lambda_1 MBTI\_Traits + Control + \varepsilon$

H6: $Performance = \lambda_0 + \lambda_1 Motivation + \lambda_2 Satisfaction + \lambda_3 Approach + \lambda_4 Effort + Control + \varepsilon$

The model specifications are designed to assess the relationships between various factors and performance outcomes, with a particular focus on the influence of MBTI traits. Hypotheses H1 to H5 examine how MBTI traits influence motivation, satisfaction, learning approach, effort, and performance, each incorporating control variables. At last, H6 models performance as a function of MBTI traits, motivation, satisfaction, approach, effort, and controls. An error term

(ε) accounts for unobserved factors. The comprehensive model integrates all key predictors to capture direct and indirect effects on performance.

4. Data and Method

This study employed a survey-based methodology to examine the relationship between MBTI personality traits and student performance. Participants were undergraduate students enrolled in accounting and finance courses. The survey collected demographic information, personality traits, and key academic variables. Data collection took place between 2023 and 2025, with all participants being students from the BSNS115 course (a first-year core accounting paper) to ensure consistency in the study's context.

Students were invited to participate voluntarily, with all responses anonymized. Each survey was assigned a unique research ID, allowing student responses to be linked to their academic performance while maintaining confidentiality. Those who completed the survey received a $20 supermarket voucher as a token of appreciation[1]. Personality types were assessed using the 16 Personalities framework, where participants identified their MBTI classification (i.e., Extraverted/Introverted, Intuitive/Observant, Thinking/Feeling, Judging/Prospecting) and indicated whether they exhibited assertive or turbulent tendencies. Demographic information, including age, gender, ethnicity, and first-language status, was also collected.

Self-control was measured using the Brief Self-Control Scale (Tangney, Boone, & Baumeister, 2018) on a scale of 1 to 5, with higher scores indicating better self-control. Learning satisfaction is also measured on a scale from 1 to 5, where higher scores indicate greater satisfaction, based on research by (Fortin, Viger, Deslandes, Callimaci, & Desforges, 2019). Similarly, on a 1 to 5 scale, learning motivation was divided into intrinsic and extrinsic motivation, with higher scores representing higher motivation (Dull, Schleifer, & McMillan, 2015) (Ahmad, Anantharaman, & Ismail, 2012). Learning approach was categorized into deep, surface, and strategic orientations, based on (Duff*, 2004). Effort was quantified as the average number of study hours per week beyond lectures, while academic performance was recorded as final course marks on a 0–100 scale.

Descriptive statistics and regression analyses were conducted to explore the associations between personality traits and academic outcomes. Control variables, including age, gender,

---

[1] We sincerely appreciate AFFANZ for the grant that funded this research.

and ethnicity, were included in the models to account for potential confounding effects. The results provide insights into how different personality traits influence student performance and engagement in academic settings.

Table 1 Variable Description

Variables	Description
Personality	Extraverted/Introverted; Intuitive/Observant; Thinking/Feeling; Judging/Prospecting;
Self control	Range between 1-5, higher score indicates better self-control
Learnings satisfaction	Range between 1-5, higher score indicates better satisfaction
Learning motivation	Intrinsic and Extrinsic motivation, Range between 1-5, higher score indicates greater motivation.
Learning approach	Range between 1-3, higher score indicates deeper approach.
Effort	Number of hours spend on average per week in addition to lecture.
Mark	Measured on a scale of 0-100
Age	Number of years since birth
Gender	Coded 1 if male, 0 otherwise.

5. Results and Analysis

The summary statistics reported in Table 2 reveal a diverse distribution of the variables in this dataset. The mean grade is 72.67 percent, with a relatively high standard deviation of 16.46, indicating significant variation in academic performance. The learning approach and effort levels are moderate, with means of 1.92 and 2.03, respectively, and notable variability in effort (SD = 1.27). Personality traits, such as extraversion and introversion, show an equal distribution with means around 57.67 and 42.33, respectively, though both have large variances. The intuitive and observant scales are closely aligned, with means near 50. The thinking and feeling dimensions also balance each other, with means near 50. The judging and prospecting traits exhibit a greater difference, with judging slightly higher on average. Assertive and turbulent traits have similar means (45.83 and 54.17), showing comparable levels of these characteristics in the sample. The average age of the sample is 18.63. On motivation and self-control measures, intrinsic motivation (mean = 3.15) is slightly lower than extrinsic motivation (mean = 3.95), while self-control averages 2.40, suggesting moderate self-regulation. Learning satisfaction shows a mean of 3.28. These statistics suggest a balanced and varied sample in terms of personality traits, motivation, and academic performance.

Table 2 Summary Statistics of Key Variables

Variable	Obs	Mean	Std. dev.	Min	Max
Performance (Mark)	144	72.66667	16.46399	0	97
Learning_approach	144	1.916667	.7337994	1	3
Effort	144	2.027778	1.273421	0	5
Extraverted	144	57.66667	18.03222	10	95
Introverted	144	42.33333	18.03222	5	90
Intuitive	144	49.85417	15.4372	15	81
Observant	144	50.14583	15.4372	19	85
Thinking	144	50.32639	15.05692	16	89
Feeling	144	49.67361	15.05692	11	84
Judging	144	54.0625	19.20417	10	93
Prospecting	144	45.9375	19.20417	7	90
Assertive	144	45.83333	19.02115	8	89
Turbulent	144	54.16667	19.02115	11	92
Age	144	18.625	1.002619	17	25
Self_control	144	2.396368	0.551807	0.615385	3.846154
Learning_satisfaction	144	3.28125	0.534537	2	5
Intrinsic_motivation	144	3.152778	0.598009	1.5	4.5
Extrinsic_motivation	144	3.951389	0.756255	1.5	5

Note: This table reports descriptive statistics based on all the variables. The descriptive statistics of variables are on the basis of levels.

Table 3 illustrates the distribution of variables and reveals distinct trends across gender, ethnicity, and language groups. For gender, males constitute 42% of the low mark group and 58% of the high mark group, while females represent 45% of the low marks and 55% of the high marks. Non-binary and those who prefer not to say have minimal representation. In terms of ethnicity, New Zealand Europeans account for the majority in both low (40%) and high (60%) mark groups, while Maori, Samoan, Tongan, Chinese, and Indian groups show more balanced distributions. Notably, the 'Other' ethnic category has the highest percentage (64%) in the low marks group. Regarding language, English speakers represent 42% of the low mark group and 58% of the high mark group, with bilinguals showing a higher proportion of low marks (83%) compared to high marks (17%). Non-English speakers exhibit equal distribution across the low and high mark categories.

Table 3 Sample Distribution

		Low mark		High mark	
	N	**number**	**%**	**number**	**%**
Gender:					
Male	60	25	42%	35	58%
Female	82	37	45%	45	55%
Non-binary	1	1	100%	0	0%
Prefer not to say	1	0	0%	1	100%

total	144	63	44%	81	56%
Ethnic:					
New Zealand European	112	45	40%	67	60%
Maori	11	5	45%	6	55%
Samoan	3	2	67%	1	33%
Tongan	3	2	67%	1	33%
Chinese	2	1	50%	1	50%
Indian	2	1	50%	1	50%
Other	11	7	64%	4	36%
total	144	63	44%	81	56%
Language:					
English	136	57	42%	79	58%
Non-English	2	1	50%	1	50%
Bilingual	6	5	83%	1	17%
total	144	63		81	

In Table 4, the correlation analysis highlights key relationships among self-control, motivation, effort, and personality traits. Self-control is positively linked to effort ($p<0.05$) and judging traits ($p<0.01$), suggesting that individuals with higher self-control tend to invest more effort in their studies. Conversely, prospecting traits negatively correlate with self-control ($p<0.01$) and effort ($p<0.01$), indicating challenges in maintaining consistent study habits.

Intrinsic motivation is positively associated with intuition ($p<0.1$) and negatively with thinking traits ($p<0.1$), suggesting intuitive individuals are more internally motivated, while logical thinkers may be less so. Learning approach correlates with both intrinsic ($p<0.1$) and extrinsic motivation ($p<0.1$), indicating that students may be driven by a mix of personal interest and external rewards. These findings underscore the influence of personality and self-control on academic effort and motivation, shaping students' learning engagement.

Table 4 Correlation

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Self_control	1															
Learning satisfaction	0.0984	1														
Intrinsic_motivation	0.178	0.149	1													
Extrinsic motivation	0.100	0.167	0.159	1												
Learning approach	0.0856	0.174	0.194*	0.214*	1											
Effort	0.292**	0.0155	0.165	0.117	0.101	1										
Extraverted	0.113	0.0979	0.0715	0.0319	0.0649	0.0138	1									
Introverted	-0.113	-0.0979	-0.0715	-0.0319	-0.0649	-0.0138	-1	1								
Intuitive	-0.0639	-0.00606	0.201*	0.178	0.0605	-0.00878	0.107	-0.107	1							
Observant	0.0639	0.00606	-0.201*	-0.178	-0.0605	0.00878	-0.107	0.107	-1	1						
Thinking	-0.0826	0.125	-0.232*	0.0971	0.0681	-0.0155	-0.182	0.182	-0.108	0.108	1					
Feeling	0.0826	-0.125	0.232*	-0.0971	-0.0681	0.0155	0.182	-0.182	0.108	-0.108	-1	1				
Judging	0.456***	0.0909	-0.0154	0.0466	0.0809	0.319***	0.124	-0.124	-0.0969	0.0969	0.141	-0.141	1			
Prospecting	-0.456***	-0.0909	0.0154	-0.0466	-0.0809	-0.319***	-0.124	0.124	0.0969	-0.0969	-0.141	0.141	-1	1		
Assertive	0.185*	0.109	-0.161	-0.0859	0.0672	-0.0735	0.381***	-0.381***	0.0648	-0.0648	0.0686	-0.0686	0.0739	-0.0739	1	
Turbulent	-0.185*	-0.109	0.161	0.0859	-0.0672	0.0735	-0.381***	0.381***	-0.0648	0.0648	-0.0686	0.0686	-0.0739	0.0739	-1	1

Note: t statistics are significant at * p < 0.10, ** p < 0.05, *** p < 0.01

Results in Table 5 provide insights into the relationships between MBTI personality traits and student motivation, measured as extrinsic and intrinsic motivation.

For extrinsic motivation, the statistically significant personality trait is 'Intuitive' in column (2), which has a positive coefficient ($p<0.1$). This suggests that students with higher (lower) intuitive (observant) scores tend to exhibit greater (lower) extrinsic motivation. Among control variables, ethnicity category 8 (Indian) has a consistently positive and significant association across all models, with coefficients around 1.8–2.0 ($p<0.05$), indicating that students from this ethnic group are more extrinsically motivated compared to others.

language category 5(bilingual) has a negative and marginally significant effect on extrinsic motivation, indicating that language differences might influence motivation levels.

For intrinsic motivation, 'Intuitive' is positively associated with intrinsic motivation (0.246, $p < 0.05$ in column 2), while 'Thinking' (-0.226, $p < 0.01$ in column 3) and 'Assertive' (-0.231, $p < 0.01$ in column 5) are negatively associated. These results indicate that intuitive individuals are more intrinsically motivated, while thinking-oriented and assertive individuals exhibit lower intrinsic motivation. Additionally, 'Self-control' consistently shows a positive and significant association with intrinsic motivation across all models, with coefficients ranging from 0.245 to 0.323 ($p < 0.01$). This suggests that self-discipline plays a vital role in fostering intrinsic motivation.

Table 5 Regression Results for the Relationship Between MBTI Personality Traits and Student Motivation

H1: Motivation=$\lambda_0+\lambda_1 MBTI\_Traits+$ Control $+\varepsilon$

VARIABLES	(1) Extrinsic_motivation	(2) Extrinsic_motivation	(3) Extrinsic_motivation	(4) Extrinsic_motivation	(5) Extrinsic_motivation
Extraverted	0.0238				
	(0.0869)				
Intuitive		0.159*			
		(0.0883)			
Thinking			0.0817		
			(0.0873)		
Judging				-0.0551	
				(0.103)	
Assertive					-0.0256
					(0.0884)
Self_control	0.126	0.140	0.140	0.156	0.136
	(0.0883)	(0.0860)	(0.0872)	(0.0994)	(0.0891)
Age	0.108	0.0790	0.112	0.108	0.102
	(0.102)	(0.102)	(0.102)	(0.102)	(0.103)
2.Gender	0.0849	0.0869	0.109	0.122	0.0804
	(0.178)	(0.176)	(0.179)	(0.189)	(0.179)
4.Gender	-0.461	-0.375	-2.436*	-2.135	-0.415
	(1.458)	(1.439)	(1.396)	(1.406)	(1.458)
2.Ethnic	-0.0362	-0.0200	-0.0588	-0.0632	-0.0482
	(0.316)	(0.309)	(0.312)	(0.313)	(0.312)
3.Ethnic	0.247	0.390	0.305	0.251	0.245
	(0.634)	(0.631)	(0.634)	(0.633)	(0.634)
7.Ethnic	1.388	1.055	1.416	1.522	1.365
	(1.213)	(0.710)	(1.207)	(1.229)	(1.220)
8.Ethnic	1.896**	1.835**	1.843**	1.915**	1.839**
	(0.785)	(0.772)	(0.779)	(0.784)	(0.789)
9.Ethnic	-0.00988	-0.0575	-0.0258	-0.00566	-0.00923
	(0.358)	(0.354)	(0.357)	(0.358)	(0.358)
2.Language	-0.123	-0.186	-0.157	-0.173	-0.160
	(0.776)	(0.761)	(0.768)	(0.771)	(0.771)
5.Language	-1.126	-1.273*	-1.144*	-1.194*	-1.103
	(0.690)	(0.684)	(0.686)	(0.695)	(0.700)
Constant	-0.0443	-0.0435	-0.0524	-0.0638	-0.0402
	(0.138)	(0.136)	(0.138)	(0.143)	(0.138)
Observations	144	144	144	144	144
R-squared	0.126	0.147	0.131	0.127	0.126

VARIABLES	(6) Intrinsic_motivation	(7) Intrinsic_motivation	(8) Intrinsic_motivation	(9) Intrinsic_motivation	(10) Intrinsic_motivation
Extraverted	0.0749				
	(0.0875)				
Intuitive		0.222**			
		(0.0881)			
Thinking			-0.226***		
			(0.0861)		
Judging				-0.0615	
				(0.104)	
Assertive					-0.231***
					(0.0868)
Self_control	0.257***	0.284***	0.245***	0.300***	0.323***
	(0.0888)	(0.0857)	(0.0860)	(0.100)	(0.0875)
Age	-0.0770	-0.121	-0.100	-0.0804	-0.118
	(0.103)	(0.102)	(0.101)	(0.103)	(0.101)
2.Gender	-0.0181	-0.0119	-0.0730	0.0269	-0.0699
	(0.179)	(0.175)	(0.176)	(0.191)	(0.176)
4.Gender	-2.130	-1.971	-1.741	-2.066	-1.850
	(1.467)	(1.434)	(1.436)	(1.467)	(1.432)
2.Ethnic	-0.0977	-0.0961	-0.107	-0.152	-0.135
	(0.317)	(0.308)	(0.307)	(0.316)	(0.307)
3.Ethnic	0.161	0.371	0.0295	0.176	0.118
	(0.638)	(0.629)	(0.626)	(0.639)	(0.623)
7.Ethnic	2.196*	2.239*	2.230*	2.384*	1.872
	(1.220)	(1.193)	(1.191)	(1.239)	(1.198)
8.Ethnic	0.591	0.466	0.598	0.566	0.212
	(0.790)	(0.769)	(0.768)	(0.791)	(0.775)
9.Ethnic	0.223	0.147	0.234	0.217	0.263
	(0.360)	(0.353)	(0.352)	(0.361)	(0.352)
2.Language	-0.436	-0.571	-0.497	-0.546	-0.617
	(0.781)	(0.759)	(0.757)	(0.777)	(0.757)
5.Language	-0.643	-0.872	-0.675	-0.747	-0.350
	(0.694)	(0.681)	(0.676)	(0.701)	(0.687)
Constant	-0.0133	-0.0106	0.0147	-0.0331	0.0180
	(0.139)	(0.136)	(0.136)	(0.144)	(0.136)
Observations	144	144	144	144	144
R-squared	0.104	0.141	0.144	0.101	0.146

Note: This table reports the OLS results between MBTI personality traits and student motivation. The outcome variables are Intrinsic and Extrinsic motivation, and the independent variable is the MBTI personality trait. T-statistics are reported in parentheses. *p < 0.1, **p < 0.05, ***p < 0.01.

The regression results in Table 6 examine the relationship between MBTI personality traits and student satisfaction. Across the five models, none of the MBTI traits show statistically significant associations with student satisfaction across the models, as indicated by the lack of significant t-statistics for their coefficients. Among the control variables, self-control and Age consistently have a positive relationship with student satisfaction across all models, though its coefficients are not statistically significant. The results suggest that MBTI personality traits may have limited influence on student satisfaction, and other factors might play a more critical role in determining satisfaction levels.

Table 7 presents regression results on the relationship between MBTI personality traits and student learning approaches. While no MBTI traits show significant effects, age consistently exhibits a positive, marginally significant association ($p < 0.1$ in Models 1, 3, 4, and 5), suggesting that older students may adopt different learning strategies. Additionally, ethnicity (specifically Group 3 Samon) is negatively associated with the learning approach at the 5% significance level in most models (a higher approach score indicates deep learning), indicating potential cultural or contextual influences on learning behaviour.

Table 6 Regression Results for the Relationship Between MBTI Personality Traits and Student Satisfaction

H2: Satisfaction=$\lambda_0+\lambda_1 MBTI\_Traits+$ Control $+\varepsilon$

VARIABLES	(1) Learning_satisfaction	(2) Learning_satisfaction	(3) Learning_satisfaction	(4) Learning_satisfaction	(5) Learning_satisfaction
Extraverted	0.100				
	(0.0841)				
Intuitive		-0.0280			
		(0.0870)			
Thinking			0.0780		
			(0.0849)		
Judging				0.0548	
				(0.100)	
Assertive					0.0696
					(0.0858)
Self_control	0.0558	0.0834	0.0942	0.0592	0.0693
	(0.172)	(0.0846)	(0.0848)	(0.0967)	(0.0865)
Age	0.0558	0.124	0.125	0.117	0.130
	(0.172)	(0.100)	(0.0992)	(0.0993)	(0.0999)
2.Gender	0.0558	0.0638	0.0848	0.0290	0.0812
	(0.172)	(0.173)	(0.174)	(0.184)	(0.174)
4.Gender	1.542	1.625	1.526	1.642	1.574
	(1.411)	(1.416)	(1.417)	(1.415)	(1.415)
2.Ethnic	-0.558*	-0.614**	-0.619**	-0.594*	-0.609**
	(0.305)	(0.304)	(0.303)	(0.305)	(0.303)
3.Ethnic	-0.656	-0.660	-0.584	-0.635	-0.617
	(0.614)	(0.621)	(0.617)	(0.616)	(0.616)
7.Ethnic	0.0447	0.127	0.134	0.0105	0.240
	(1.174)	(1.178)	(1.175)	(1.196)	(1.184)
8.Ethnic	-0.244	-0.335	-0.370	-0.384	-0.250
	(0.760)	(0.760)	(0.758)	(0.763)	(0.766)
9.Ethnic	0.380	0.364	0.346	0.346	0.339
	(0.347)	(0.348)	(0.347)	(0.348)	(0.348)
2.Language	0.342	0.236	0.222	0.253	0.259
	(0.751)	(0.749)	(0.747)	(0.750)	(0.748)
5.Language	0.0234	-0.0107	-0.0380	0.0203	-0.135
	(0.667)	(0.673)	(0.667)	(0.676)	(0.679)
Constant	-0.0178	-0.0137	-0.0224	0.00661	-0.0222
	(0.133)	(0.134)	(0.134)	(0.139)	(0.134)
Observations	144	144	144	144	144
R-squared	0.150	0.142	0.147	0.143	0.145

Note: This table reports the OLS results between MBTI personality traits and student satisfaction. The outcome variable is student satisfaction, and the independent variable is the MBTI personality trait. T-statistics are reported in parentheses. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$.

Table 7 Regression Results for the Relationship Between MBTI Personality Traits and Student Learning Approach

H3: Approach=λ_0+λ_1MBTI_Traits+ Control +ε

VARIABLES	(1) Approach	(2) Approach	(3) Approach	(4) Approach	(5) Approach
Extraverted	0.115				
	(0.0881)				
Intuitive		0.107			
		(0.0907)			
Thinking			0.0296		
			(0.0893)		
Judging				0.0180	
				(0.105)	
Assertive					0.0927
					(0.0898)
Self_control	0.0695	0.0967	0.0939	0.0820	0.0695
	(0.0895)	(0.0883)	(0.0892)	(0.101)	(0.0905)
Age	0.192*	0.164	0.185*	0.182*	0.197*
	(0.104)	(0.105)	(0.104)	(0.104)	(0.105)
2.Gender	0.00704	0.0163	0.0242	0.00478	0.0394
	(0.180)	(0.181)	(0.183)	(0.193)	(0.182)
4.Gender	-1.076	-0.926	-1.010	-0.966	-1.052
	(1.478)	(1.478)	(1.490)	(1.485)	(1.481)
2.Ethnic	0.0825	0.0436	0.0207	0.0294	0.0243
	(0.320)	(0.318)	(0.319)	(0.320)	(0.318)
3.Ethnic	-1.342**	-1.224*	-1.298**	-1.318**	-1.294**
	(0.643)	(0.648)	(0.649)	(0.647)	(0.644)
7.Ethnic	0.614	0.698	0.709	0.668	0.859
	(1.230)	(1.229)	(1.235)	(1.255)	(1.239)
8.Ethnic	1.056	0.919	0.934	0.931	1.067
	(0.796)	(0.793)	(0.797)	(0.801)	(0.802)
9.Ethnic	-0.0783	-0.134	-0.109	-0.109	-0.128
	(0.363)	(0.364)	(0.365)	(0.365)	(0.364)
2.Language	-0.360	-0.513	-0.491	-0.480	-0.449
	(0.787)	(0.782)	(0.785)	(0.787)	(0.783)
5.Language	-0.356	-0.512	-0.424	-0.404	-0.557
	(0.699)	(0.702)	(0.701)	(0.709)	(0.711)
Constant	0.00416	0.00868	0.00554	0.0155	-0.00249
	(0.140)	(0.140)	(0.141)	(0.146)	(0.140)
Observations	144	144	144	144	144
R-squared	0.115	0.113	0.104	0.103	0.110

Note: This table reports the OLS results between MBTI personality traits and student learning approach. The outcome variable is the student learning approach, and the independent variable is the MBTI personality trait with controls. T-statistics are reported in parentheses. *p < 0.1, **p < 0.05, ***p < 0.01.

Table 8 examines the predictors of student effort. Among the MBTI traits, Judging (J) is the only significant predictor of student effort, showing a positive and highly significant effect (0.279, p<0.01), suggesting that students who prefer structure and planning tend to exert more effort. In contrast, Extraversion, Intuition, Thinking, and Assertiveness do not exhibit significant effects on effort. Among the control variables, self-control consistently demonstrates a positive and highly significant association with effort (p < 0.01 in most models). Age has a marginally negative association with effort in some models, while gender (female) is positively associated with effort (0.42, p<0.05), indicating that female students may exert more effort than their male counterparts.

Table 9 examines the relationship between MBTI personality traits and student performance. Self-control emerges as an important predictor, with a positive and statistically significant effect, suggesting that higher self-control is associated with better performance.

Ethnic group 2 (Maori) consistently shows a significant negative association with performance across all models (p < 0.01), while ethnic group 7 (Chinese) displays a positive and significant relationship in most models (p < 0.05 or p < 0.1). Additionally, language group 5 (Bilingual) exhibits a strong negative association with performance (p < 0.01), suggesting that language proficiency could be an important factor affecting student outcomes. These results highlight the potential influence of ethnicity and language on student outcomes, suggesting areas for further investigation into cultural or systemic factors.

Overall, while the MBTI traits do not exhibit a strong direct relationship with performance, self-control and certain ethnic and language factors appear to play a more significant role in shaping student performance.

Table 8 Regression Results for the Relationship Between MBTI Personality Traits and Student Effort

H4: Effort=λ_0+λ_1MBTI_Traits+ Control +ε

VARIABLES	(1) Effort	(2) Effort	(3) Effort	(4) Effort	(5) Effort
Extraverted	-0.0968				
	(0.0852)				
Intuitive		0.00108			
		(0.0881)			
Thinking			0.0440		
			(0.0862)		
Judging				0.279***	
				(0.0985)	
Assertive					-0.0886
					(0.0867)
zSelf_control	0.340***	0.322***	0.327***	0.191**	0.342***
	(0.0866)	(0.0857)	(0.0861)	(0.0951)	(0.0875)
zAge	-0.174*	-0.166	-0.163	-0.177*	-0.180*
	(0.100)	(0.102)	(0.101)	(0.0976)	(0.101)
2.Gender	0.419**	0.412**	0.424**	0.235	0.390**
	(0.175)	(0.175)	(0.177)	(0.181)	(0.176)
4.Gender	-0.0988	-0.189	-0.252	-0.161	-0.110
	(1.430)	(1.435)	(1.438)	(1.392)	(1.431)
2.Ethnic	-0.119	-0.0696	-0.0754	0.00607	-0.0695
	(0.309)	(0.308)	(0.308)	(0.300)	(0.307)
3.Ethnic	0.173	0.154	0.181	0.154	0.130
	(0.622)	(0.629)	(0.626)	(0.606)	(0.622)
7.Ethnic	1.405	1.327	1.332	0.744	1.180
	(1.189)	(1.193)	(1.192)	(1.176)	(1.197)
8.Ethnic	-0.248	-0.154	-0.169	-0.370	-0.271
	(0.770)	(0.770)	(0.769)	(0.750)	(0.775)
9.Ethnic	-0.209	-0.187	-0.192	-0.236	-0.165
	(0.351)	(0.353)	(0.352)	(0.342)	(0.351)
2.Language	0.168	0.276	0.272	0.397	0.239
	(0.761)	(0.759)	(0.758)	(0.737)	(0.757)
5.Language	-0.257	-0.202	-0.203	0.0761	-0.0725
	(0.676)	(0.682)	(0.677)	(0.665)	(0.687)
Constant	-0.230*	-0.234*	-0.239*	-0.131	-0.224
	(0.135)	(0.136)	(0.136)	(0.137)	(0.136)
Observations	144	144	144	144	144
R-squared	0.172	0.163	0.165	0.212	0.170

Note: This table reports the OLS results between MBTI personality traits and student efforts. The outcome variable is the student efforts, and the independent variable is the MBTI personality trait with controls. T-statistics are reported in parentheses. *p < 0.1, **p < 0.05, ***p < 0.01.

Table 9 Regression Results for the Relationship Between MBTI Personality Traits and Student Performance

H5: Performance=$\lambda_0+\lambda_1 MBTI\_Traits+$ Control $+\varepsilon$

VARIABLES	(1) Performance	(2) Performance	(3) Performance	(4) Performance	(5) Performance
Extraverted	0.0371				
	(0.0833)				
Intuitive		-0.0432			
		(0.0857)			
Thinking			0.0732		
			(0.0837)		
Judging				-0.0397	
				(0.0988)	
Assertive					-0.0554
					(0.0846)
Self_control	0.150*	0.154*	0.165*	0.175*	0.169*
	(0.0846)	(0.0834)	(0.0836)	(0.0953)	(0.0853)
Age	-0.0242	-0.0197	-0.0215	-0.0255	-0.0356
	(0.0980)	(0.0989)	(0.0978)	(0.0979)	(0.0986)
2.Gender	0.0680	0.0709	0.0907	0.0961	0.0571
	(0.171)	(0.170)	(0.172)	(0.182)	(0.172)
4.Gender	0.631	0.649	0.563	0.662	0.716
	(1.397)	(1.395)	(1.397)	(1.395)	(1.396)
2.Ethnic	-0.766**	-0.793***	-0.794***	-0.796***	-0.785***
	(0.302)	(0.300)	(0.299)	(0.301)	(0.299)
3.Ethnic	0.0503	0.0203	0.106	0.0579	0.0439
	(0.608)	(0.612)	(0.609)	(0.608)	(0.607)
7.Ethnic	2.287*	2.320**	2.325**	2.400**	2.225*
	(1.163)	(1.160)	(1.158)	(1.179)	(1.168)
8.Ethnic	1.171	1.145	1.109	1.166	1.062
	(0.753)	(0.748)	(0.747)	(0.752)	(0.756)
9.Ethnic	-0.450	-0.447	-0.468	-0.452	-0.445
	(0.343)	(0.343)	(0.342)	(0.343)	(0.343)
2.Language	0.440	0.409	0.392	0.382	0.376
	(0.744)	(0.738)	(0.736)	(0.739)	(0.738)
5.Language	-2.631***	-2.616***	-2.656***	-2.692***	-2.572***
	(0.661)	(0.663)	(0.658)	(0.667)	(0.670)
Constant	0.0852	0.0868	0.0786	0.0720	0.0935
	(0.132)	(0.132)	(0.132)	(0.137)	(0.132)
Observations	144	144	144	144	144
R-squared	0.208	0.209	0.212	0.208	0.210

Note: This table reports the OLS results between MBTI personality traits and student performance. The outcome variable is the student performance, and the independent variable is the MBTI personality trait with controls. T-statistics are reported in parentheses. *p < 0.1, **p < 0.05, ***p < 0.01.

Table 10 examines the factors influencing student performance, with the dependent variable being the student marks. Among the key predictors, extrinsic motivation is positively associated with student performance and statistically significant at the 10% level, suggesting that higher extrinsic motivation correlates with better academic outcomes. However, neither learning satisfaction, effort, nor learning approach shows a statistically significant relationship with student performance in this model.

Control variables reveal additional insights. Notably, being part of the second ethnic group (Maori) is associated with significantly lower performance (-0.722, $p < 0.05$), while students in the seventh ethnic group (Chinese) show a significant positive association (1.999, $p < 0.1$). Language group 5 (Bilingual) shows a strong negative impact on performance (-2.405, $p < 0.01$). Other control variables, such as age, gender, and self-control, do not exhibit statistically significant relationships with student performance.

Table 10 Regression Results for Student Performance

VARIABLES	(1) Performance
Extrinsic_motivation	0.160*
	(0.0839)
Intrinsic_motivation	0.0588
	(0.0850)
Learning_satisfaction	0.0916
	(0.0889)
Effort	-0.0885
	(0.0852)
Learning_approach	0.0942
	(0.0847)
Self_control	0.132
	(0.0882)
Age	-0.0821
	(0.0989)
2.Gender	0.0868
	(0.171)
4.Gender	0.782
	(1.391)
2.Ethnic	-0.722**
	(0.298)
3.Ethnic	0.203
	(0.607)
7.Ethnic	1.999*
	(1.159)
8.Ethnic	0.734
	(0.755)
9.Ethnic	-0.508
	(0.338)
2.Language	0.503
	(0.727)
5.Language	-2.405***
	(0.655)
Constant	0.0740
	(0.131)
Observations	144
R-squared	0.264

Note: This table presents the results of OLS regressions analyzing factors affecting student performance. The dependent variable is student performance. Independent student motivation, learning satisfaction, efforts, and learning approach. Control variables include self-control, age, gender, ethnicity, and language. T-statistics are reported in parentheses. $*p < 0.1$, $**p < 0.05$, $***p < 0.01$.

6. Discussion

In this study, key factors believed to influence student satisfaction, learning approaches, effort, and performance were investigated. MBTI personality traits show some impact on student motivation, but limited impact on satisfaction, approach, effort and performance. This challenges the assumption that personality alone dictates behaviour and learning style. These findings support the work of Kanuka and Nocente (2010) who showed that there was limited relationship between student satisfaction and personality type alone.

Age appears to influence learning approaches, with older students adopting different strategies, possibly due to life experience, career goals, or prior education. Additionally, cultural background impacts learning behaviour, as seen in the negative association between certain ethnic groups and learning approaches. Moody (1993) showed that learning styles are influenced by many non-cognitive variables, and that an individual comes to an experience with a certain set of predisposed assumptions and qualities.

Effort is strongly linked to the Judging personality trait. However, other MBTI traits show no clear relationship with effort, indicating that motivation and study habits are shaped by broader influences. Gender differences also emerge, with female students demonstrating higher effort levels, pointing to potential variations in academic attitudes and expectations. This is consistent with prior work in the area, showing that different genders can have different learning styles (Beatson, Sithole, de Lange, O'Connell, & Smith, 2025).

Self-control consistently predicts academic success, highlighting the importance of time management, persistence, and discipline. This finding indicates that universities should integrate self-regulation strategies into student support programs to enhance focus and resilience.

Ethnicity and language background also play a substantial role in performance. Some ethnic groups show disparities, and bilingual students tend to perform worse, suggesting that language proficiency may be a barrier. These findings call for targeted support, including language assistance and culturally responsive teaching, to ensure equitable learning opportunities.

Extrinsic motivation emerges as a significant predictor of academic success, suggesting that external rewards drive performance. However, learning satisfaction, effort, and approach do not directly correlate with performance, indicating that engagement alone does not guarantee

success. This challenges traditional metrics of student achievement and highlights the need for a broader understanding of academic success.

References

Ahmad, Z., Anantharaman, R., & Ismail, H. (2012). Students' motivation, perceived environment and professional commitment: An application of Astin's college impact model. *Accounting Education, 21*(2), 187-208.

Asendorpf, J. B. (2002). The puzzle of personality types. *European Journal of Personality*, *16*(1_suppl), S1-S5.

Catherine, B. C., & Wheeler, D. D. (1994). The Myers-Briggs personality type and its relationship to computer programming. *Journal of Research on Computing in Education*, *26*(3), 358-370.

Chamorro-Premuzic, T., Furnham, A., (2008) Personality, intelligence and approaches to learning as predictors of academic performance, *Personality and Individual Differences*, 44 (7), pp. 1596-1603

Church, A. T. (2016). Personality traits across cultures. *Current Opinion in Psychology*, *8*, 22-30.

Baghoomian, R., Rajabdorri, H., & Khoramin, M. (2017). Studying the relationship of personality factors and learning in accounting students. *Empirical Studies in Financial Accounting*, *14*(55), 125-143.

Beatson, N. J., Sithole, S. T., de Lange, P., O'Connell, B., & Smith, J. K. (2025). Sources of self-efficacy beliefs in learning accounting: does gender matter?. *Journal of International Education in Business*.

Bekele, T. A. (2010). Motivation and satisfaction in internet-supported learning environments: A review. *Journal of Educational Technology & Society*, *13*(2), 116-127.

Bohannan, P. (1971). Social anthropology. London: Holt, Rinehart & Winston. (Original work published 1963)

Booth, P., & Winzar, H. (1993). Personality biases of accounting students: Some implications for learning style preferences. *Accounting & Finance*, *33*(2), 109-120.

Brownfield, K. M. (1993). The Relationship between the Myers-Briggs Personality Types and Learning Styles.

Cheng, F. F., Wu, C. S., & Su, P. C. (2021). The impact of collaborative learning and personality on satisfaction in innovative teaching context. *Frontiers in Psychology*, *12*, 713497.

Doménech-Betoret, F., Abellán-Roselló, L., & Gómez-Artiga, A. (2017). Self-efficacy, satisfaction, and academic achievement: the mediator role of Students' expectancy-value beliefs. *Frontiers in psychology*, *8*, 1193.

Downs, G. H. (2019, August). An exploration of the relationship between personality type and satisfaction with online learning environments. In *2019 Portland International Conference on Management of Engineering and Technology (PICMET)* (pp. 1-4). IEEE.

Drummond, R. J., & Stoddard, A. H. (1992). Learning style and personality type. *Perceptual and Motor Skills*, *75*(1), 99-104.

Duff, A.,Boyle, E., Dunleavy, K., Ferguson, J., (2004) The relationship between personality, approach to learning and academic performance *Personality and Individual Differences*, 36 (8), pp. 1907-1920

Duff*, A. (2004). Understanding academic performance and progression of first-year accounting and business economics undergraduates: the role of approaches to learning and prior academic achievement. *Accounting Education, 13*(4), 409-430.

Dull, R. B., Schleifer, L. L., & McMillan, J. J. (2015). Achievement goal theory: The relationship of accounting students' goal orientations with self-efficacy, anxiety, and achievement. *Accounting Education, 24*(2), 152-174.

Ehrman, M., & Oxford, R. (1990). Adult language learning styles and strategies in an intensive training setting. *The modern language journal*, *74*(3), 311-327.

Fortin, A., Viger, C., Deslandes, M., Callimaci, A., & Desforges, P. (2019). Accounting students' choice of blended learning format and its impact on performance and satisfaction. *Accounting Education, 28*(4), 353-383.

Hadfield, O. D., & McNcil, K. (1994). The relationship between Myers-Briggs personality type and mathematics anxiety among preservice elementary teachers. *Journal of Instructional Psychology*, *21*(4), 375.

Harrington, R., & Loffredo, D. A. (2010). MBTI personality type and other factors that relate to preference for online versus face-to-face instruction. *The Internet and Higher Education*, *13*(1-2), 89-95.

Hofstede, G., & McCrae, R. R. (2004). Personality and culture revisited: Linking traits and dimensions of culture. *Cross-cultural research*, *38*(1), 52-88.

Jung, C. G. (2010). Psychological types. *Translated from German). Munich: Goldmann*.

Kanuka, H., & Nocente, N. (2003). Exploring the effects of personality type on perceived satisfaction with web-based learning in continuing professional development. *Distance Education*, *24*(2), 227-244.

Kim, S. (1999). A study on the relationship between personality, study satisfaction and academic achievement of medical students. *Korean Journal of Medical Education*, *11*(2), 271-284.

McCaulley, M. H. (1974). The Myers-Briggs Type Indicator and the Teaching-Learning Process.

McNeill, I. E., & Collins, F. (1975). Personality tendencies and learning modes in elementary accounting. *The Accounting Review*, *50*(4), 888-897.

Randall, K., Isaacson, M., & Ciro, C. (2017). Validity and reliability of the Myers-Briggs Personality Type Indicator: A systematic review and meta-analysis. *Journal of Best Practices in Health Professions Diversity*, *10*(1), 1-27.

Rawwas, M. Y. (2001). Culture, personality and morality: A typology of international consumers' ethical beliefs. *International Marketing Review*, *18*(2), 188-211.

Schunk, D. H. (1995). Self-efficacy, motivation, and performance. *Journal of applied sport psychology*, *7*(2), 112-137.

Shen, D., Cho, M. H., Tsai, C. L., & Marra, R. (2013). Unpacking online learning experiences: Online learning self-efficacy and learning satisfaction. *The Internet and Higher Education*, *19*, 10-17.

Tangney, J. P., Boone, A. L., & Baumeister, R. F. (2018). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. In *Self-regulation and self-control* (pp. 173-212): Routledge.

Thompson, B. & Borrello, G. (1986). *Measurement and evaluation in counseling and development*, vol. 18, no. 4, pp. 148–153.

Vollrath, M., & Torgersen, S. (2000). Personality types and coping. *Personality and individual differences*, *29*(2), 367-378.

Wheeler, P. R., Hunton, J. E., & Bryant, S. M. (2004). Accounting Information Systems Research Opportunities Using Personality Type Theory and the Myers-Briggs Type Indicator. *Journal of information systems*, *18*(1), 1-19.

Wynn-Williams, K., Beatson, N., & Anderson, C. (2016). The impact of unstructured case studies on surface learners: A study of second-year accounting students. *Accounting Education*, *25*(3), 272-286.