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Faculty of Cognitive Sciences and Human Development

A STUDY OF MYERS-BRIGGS TYPE INDICATOR (MBTI) AND EXECUTIVE  
FUNCTION OF LEARNING CAPABILITY AMONG 1<sup>st</sup> YEAR STUDENTS IN  
UNIMAS

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Bachelor of Science with Honours (Cognitive Science)  
2021

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in partial fulfilment of the requirements for a  
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**Grade**

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Your kindness is something I will remember and cherish at most.

*“From strangers to someone and from someone to somebody, and I hope that somebody lead to something great” – Hawa*

Thank you with all love.

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## **Chapter 1: Introduction**

### **1.1 Background of Study**

The truth understanding about Myers-Briggs Personality Type which simply known as MBTI, stated by Cherry (2020) that self-report inventory was once created to point out about traits and behaviour of people, interest, and ability in term of psychological nature. The study form was invented by Isabel Myers and her mother Katherine Briggs which also discover and went through by several research studies about cognitive function on personality test, proposed by a scientist named Carl Jung. Today, the invention MBTI inventory is a gift towards society nowadays, moreover recently it becomes a phenomenon which the test is widely used as psychological instruments around the world.

Cherry (2020) stated that Briggs was inspired by her daughter future husband named Clarence Myers, thus she started to research a personality type theory. It was clearly that Myers noticed about her son in-law, the way he gives a thought about his perception to see every single movement that happened into this world. Her son in-law was a muse to Myers for her to go in depth of the study of personality type theory for a better understanding. A huge influence towards the development of project was triggered by World War II. Myers imagine about the world with compassion and understand towards each other through her objectives in terms of humanity collective behaviour, this could lead them to work together for a better place to serve the world, thus, there would be less conflict.

The history in the making of Myers's theory was happened when she thought about to make a better place during the post-war world. Thus, she intended to bring people along with her brilliant solutions, while at the same time, as she wants to give people an access to their psychological nature as well as understand about themselves and others would be a major factor to help her achieve her goals about the world as a better place. This is probably one of the reasons she invented the indicator and took a deep research for the development of throughout her life. In about 20 years on develop the idea of the questions while making a valid instrument and theory. The instrument of the indicator was published in 1962. MBTI as a tool to measure cognitive functions such behaviour, emotions, learning styles, thinking skills and etc.

According to Carl Jung, he found out that Myers Brigg Personality helps him in advanced to study people's learning styles based on some tests. Executive Cognitive Function which known as "EF".

Executive function simplified as EF includes brain functioning area process such as attention, working memory, thinking skills, and many more, as people lives through employing their functions in their daily life as it helps them to learn and manage themselves. The test of executive cognitive usually shows the relationship between their performance can affect their cognition as well, which means a person who has difficulties to control their executive functions tendency to struggle with focus, handle emotions and among other things related. Some people understand that EF as "the process system of the brain" due to the nature of human or something related to their cognitive development whether through experience or formal learning which involve pragmatic skills, thinking skills, or the way they manage their daily life. One has proposed about a person who went through difficulties on their EF will likely affects their cognitive development whether it comes from home, school, and even life. There are few main areas of executive function such as

- (i) Working memory
- (ii) Flexible Thinking
- (iii) Inhibitory control
- (iv) Regulating emotions
- (v) Self-monitoring

Executive cognitive functioning usually develops rapidly in early childhood and possibly in the age of between 13 years to 18 years old. It is totally normal to see children at younger age may be lack in certain area compared to their peers, but it is not likely to be permanent due to the change possibility. There is no precise research to know whether the older they are, the less problems arise. Many adolescents failed to get their best learning styles, without knowing who they are and what could possible way they can do to improve their cognitive skill. They know less about themselves which likely to follow everything without knowing whether it is good for them or not.

## 1.2 Importance of Studies

Why MBTI is being thought about as one thing fascinating for the subject chosen? A gift from few previous articles concerning topic connected (similarly to the subject or relatable). There are several things that happen in our body and mind whereas we have a tendency, to do one thing. People particularly kids and adolescent use EF skills inside their daily activities but EF create an obstacles and sophisticated construct to live. Wallisch, M Little, Dean, & Dunn (2017) declared there are several measures of EF lack pertinence to lifestyle. As we go through the previous research, mostly it was about a method to look at, measurement, performance, and tasks of EF in adolescence specifically to the age in vary between thirteen to seventeen years recent and much of individuals with learning challenges struggle with executive cognitive functions too.

According to the Understood Team, the difficulties in terms of process their EF will cause hassle with learning. meantime this might indicate as a main think about terms of EF, but this does not mean someone has difficulties in EF came upon as lazy or not intelligent. A person that struggles with EF perform is even as good in their work even as laborious as others. Testing ought to be done as a part of a full analysis that appears in several areas of EF especially when it comes to their studying. The experiment process form which the researched focused on colleges students, to be resulted where the square measure usually done by psychologists. However, the square measure alternative varieties of professionals proceed in many sorts of testing. Therefore, the issues here are to check whether this research could be an indicate to test the effectiveness of Myers-Brigg Type Indicator (MBTI), to look at the executive cognitive functions.

We need to acknowledge the effects of having a trouble to control the executive cognitive functions. From there, having the mindset and determination to change ourselves for something better is crucial because no one can change us but ourselves. In this research, I will conduct a study of Myers Briggs type indicator (MBTI) to measure executive cognitive function of learning capability among school students by using a quantitative approach to collect the primary data from the participants.

### **1.3 Research Question**

The research questions are, ‘Is there any association between gender and executive functions (EF) among 1st year students in UNIMAS?’. ‘What is the association between executive functions (EF) and Myers Brigg Type Indicator (MBTI) towards their learning capability among the 1<sup>st</sup> year students in UNIMAS?’, ‘What kind of association is there between gender, MBTI, self-motivation and EF towards their learning capability among 1<sup>st</sup> year students in UNIMAS?’. Does MBTI act as a relevant source to evaluate the executive cognitive functions among the secondary school students? What are the goals for this topic?

### **1.4 Objectives**

- (i) To examine the association between gender and executive functions (EF) among 1st year students in UNIMAS.
- (ii) To determine the relationship between MBTI and executive functions (EF) among 1st year students in UNIMAS
- (iii) To determine the relationship between gender, MBTI, self-motivation, and executive functions (EF) among 1st year students in UNIMAS.

## **Chapter 2: Literature Review**

### **2.1 Theory Framework**

The processes to do a measurement of executive cognitive function often related to medical diagnosis which is about the ability of children growth and development, mostly related to the mental state and their functions. However, this study is to carry out how likely their personality type could indicate as a factor towards their learning by carry an observation test on their executive function wellness. Most of the research are searching about the effects of the external environment towards their executive functions. Therefore, the researcher would like to find out the validity of the personality types, specifically in Myers-Briggs Type Indicator (MBTI), as to prove whether the test can be an effective measurement tool to measure someone’s executive cognitive function towards their learning capability.

An event-related potential, or ERP, is that the electrophysiological response within the brain to a selected motor or psychological feature event (e.g., a stimulus). This

information is often nearly anything: a flashing light, a stunning sound, a blinking eyelid etc. So, at for the previous research is talking about how ERP manage to undermine that

can give knowledge into components supporting how official capacities create in children from preschool to youth (Downes, Bathelt, & De Haan, 2013). As it mentioned above, another definition to understand about executive cognitive functions are known as a set of cognitive components that allow a person to control their perception and actions in order to prepare, solve problems and accomplish goals. Throughout the lifetime, these abilities are significant, as it assists them to prepare for their academic achievement that is beneficial for their work performance in the future.

Here is you will be able to see, however government psychological feature functions, act collectively of significant element to watch. (Downes et al., 2013) noted that the major subcomponents of EF are represented as attention, inhibition, self-regulation, memory, cognitive flexibility, planning, organization, problem-solving, and performance. The other basic function includes inhibition as it connected to the unseemly motor response, early development and later development which called as higher-order executive functions, as well as designing and problem-solving.

Therefore, clearly it stated where the executive cognitive functions were examined by using neuroimaging. Basically, the research found where the development of executive cognitive functions during childhood is profoundly to observe something related to the diseases such as schizophrenia and autism, usually about how the children are going to process when it comes to their critical thinking, working memory and other related functions. The frequent technique used which known as neuroimaging has been a spotlight to the researcher for observe the underlying of the correlation between neural systems and EF (Downes et al., 2013). The main reason of the man of science to use neuroimaging instead of MRI due to the fastest speed of getting the result as it is more comparatively straightforward, practical, and value effective to use with younger kids, while at the same time it helps the researcher to provide the extra precise data regarding the temporal order of brain events underlying behavioural performance.

As you know, a scientist named Carl Jung have been proposed the relation between Myers-Briggs Type Indicator (MBTI) towards performance, learning skills, cognitive ability and thinking skills. Most of executive functions relates to the neuroscience

branches which specifically about the function of each brain region. It is more than just a brain. The researchers tend to take the difficulties in executive functions development at essential condition. Many diseases related to executive cognitive functions were examined by brain imaging techniques. The tools to observe the development of adolescent to test their executive cognitive functions are mostly related to imaging techniques. However, the research conduct is to test whether MBTI can provide an efficient help to undergo an observation within their executive cognitive functions.

MBTI was created a long time ago. During the meantime, it shows how MBTI is becoming a sensation towards the society. Moreover, MBTI went for many trials by a scientist named Carl Jung. He studied about MBTI for many years thus he found he can add few contents in MBTI perspective to access a stronger understanding about MBTI which associated with somebody's psychological feature perform. He projected a research where MBTI can help people to explore their insight of mind functions, while not to forget about his Big Five Personality Test that includes Openness, Conscientiousness, Agreeableness, Extraversion, and Neuroticism. Duff Boyle stated that personality is partially determined by individual's learning and approach to learning (Kamarulzaman, 2012).

## **2.2 Counter Argument and Criticism**

People particularly towards children and adolescent utilize their EF in their everyday activities. However, EF compose a difficult and complex chain during the mapping to measure. Recently, the measurement processes of EF show some slacks in terms of the way people standardize their living as it lower the accuracy of ecological validity. The study remains concerned which the research obtained by scrutinize on 2 statements of the validity of ecological accuracy towards the measurement, assessments, and tasks related to EF in children. For a further analysis ought to address the interaction between context and EF performance. Additionally, the observation shows the recognition began in the early to concern about the importance of parental involvement in assessments, as it to give an impact towards their changes and push their limit during the early education of children development. This could help them to get to know their strengths and weaknesses as well.

There are few statements that reject the personality type which is known as MBTI to be projected towards human daily life as to relate to their cognitive function. We all know the executive functions are related to the development of human in terms of their mental process, where involved an assertion into physical movements. However, Briggs was confirmed about the MBTI which she invented was due to the psychological development, therefore even it was specifically focused on the career selection, Briggs was determined to use as psychological process as well that it related to the function human's mind such as decision making, attention, working memory, and having a flexible thinking. The accuracy of MBTI is still under an observation among the researchers since MBTI is widely known by the people around the world.

Stromberg & Caswell (2015) stated MBTI was completely a meaningless test for people to participate. They claimed that it was lack of evident behind of the test because the lack of prediction by the questions given to certain situations. Even the scientist, behind of this derivative of MBTI, Carl Jung said "*there is no such thing as a pure extravert or a pure introvert. Such a man would be in the lunatic asylum.*" Everything was sorted by binary option which "yes" or "no". The advancement of MBTI test nowadays is much better with more options for the Likert scale. Stromberg & Caswell (2015) come out with the result of data from MBTI test itself shows that most people are somewhere in the middle for any one category, and just end up being pigeonholed into one or the other. The arguments continued when almost 50% of people by a research data in 2015, shows many people were likely changed their personality type after 5 weeks after they took the test. Due to this result, certain researchers are hesitated about the validation and accuracy of the test. Obviously, they did not believe how the personality type test can work efficiently towards commonly to their behaviour and emotions. In certain condition, it worked, and people are giving a good and wise feedback after taking the test.

### **2.3 Overview and Significance**

Essentially, the discernment of theories about EF and the application of the process rules, mainly to get hold of something about the variation of individuality when it comes to their personality, to explore the link between personality traits and EF (Murdock, Oddi, & Bridgett, 2013). For example, the EF components that indicated

personality or behaviour could widen of the enhancement about the related theories, as it more to advancement of the traits, while aiming for intervention in applied settings such as working memory, attention, and emotion-regulation (ER). Good working memory in cognitive development can play an essential role in someone's capacity to store the knowledge thus affects learning ability (Cowan, 2013). Besides, Murdock et al. (2013) stated that links given shows the connection between performance throughout few tested to measure EF and activation of specific areas of the brain along with the connection between EF in terms of personality development association traits prone to give an avenue for understanding the biological science origins of personality or temperament.

When Murdock et al. (2013) proposed that EF are generally focus to the temperament of human mind process, there was also a reference that take places to psychological feature processes which can be promoted onto human's behaviours. Moreover, it gives a sense of purpose to facilitate a goal attainment due to the self-regulation that cause and effects on physical and thought. The factor-analytical data was mentioned by Murdock et al. (2013) that the researcher emphasize about the indicator of EF as it consists of few processes, including cognitive flexibility inhibition and the process of updating and monitoring of working memory. In facts that cognitive flexibility mainly defined as a person's ability to maintain their level of concentration while perform a multitasking, while inhibition is more to a person's ability to stay focus towards unnecessary, whether important or not important, usually in the situation where we need to decide based on the priority. As for the process of updating and monitoring in working memory, refers to a person's ability to frequently noticed about the changes happen and fix any debugs attacked. It considered as focal process regarding to the interrelation of cognitive keywords (Murdock et al., 2013).

The previous literature came out with a suggestion that can pronounced inhibition as the introductory to the components of EF. In view of the importance in understanding the affiliation between cognition and personality, experiments have previously begun to explore links between EF and personality traits. Use one EF part involving inhibition and update/monitoring steps. alternative studies realize a correlation between EF and Neuroticism as higher levels of neuroticism, lower levels of EF output. A previous research has been known proof suggesting that mental disorder is also considerably related to the process of updating and monitoring but not inhibition.

Pervious literature found that there was an addition, which related to the association of vital negative vital between mental disorder. Each cognitive flexibility and inhibition involved to the related association as well. Collectively, these studies recommend that each one of the three EF processes is also joined to psychological disorder, though these studies failed to undercover about the relationship between all three factors of EF and mind extended functions at intervals of their samples (Murdock et al., 2013). Thus, mental psychological disorder cannot be determined by someone's EF processes, which failure to prove the relationship between EF, personality and learning ability. Moreover, all the previous research is mainly to observe the association between personality test and executive cognitive functions. Although, for my research project, I am using Myers Brigg Type Indicator to relate with their survey on the questionnaires which related to the executive cognitive function such as 'Emotion Regulation Skills (ERS)', 'Memory Functioning', 'Motivation, Engagement, Competence' and 'Time Management'.

Another previous research talked about the media multitasking (MM) on cognition which is about their attention level while perform more than one task. One of the examples about media multitasking was defined, when a person can keep their concentration in learning while listening to music. Another example is when a person can perform both tasks which is texting a message while watching a movie. The relatable about the statement above where MBTI is emphasizing the cognition of a person that require their attention and working memory. Therefore, it would help for a researcher to know which MBTI can perform their task in multitasking mode effectively. Stavrinou, McManus, Underhill, & Lechtreck (2019) suggested that MM is associated with productivity level, depends on the tasks given to connect with the sustainability of attention and self-reported basic cognitive process are main near to the failures.

According to (Stavrinou et al., 2019) longitudinal research is needed to discern how MM impacts development of attention over the course of adolescence. The result shows the association between level of MM and the integration of incidents and environment when it comes to perception and evaluation. As the higher levels of MM or the lower levels of MM will likely be impacted by the correlation above (Stavrinou et al., 2019). It is strongly associated the relationship between personality types and executive functions. There is also an indicator was saying, personality types

preferences effects on individual's motivation and interest when it comes to learning and studying. Basically, the research involved is about someone's executive cognitive functions can measure their intelligence.

## **Chapter 3: Research Methodology**

### **3.1 Research Design**

The research design used in this study is quantitative analysis. The rationale for choosing this type is because of time constraints due to only having less than 6 months to complete the research. Besides, quantitative analysis is convenient for large data samples compared to qualitative, which is important for correlational studies. The quantitative research design used is a non-experimental type which is correlational research. This design is chosen because the study only aims to identify the strength and direction of relationship between the two variables: Myers briggs test indicator (MBTI) and executive cognitive function towards their learning among 1<sup>st</sup> year students in UNIMAS.

### **3.2 Subject & Sample Size**

The study population for this research are secondary school students in Malaysia Cognitive Correlates of Personality Links Between Executive Functioning and the Big Five Personality Traits (Murdock et al., 2013) found that personality associations between executive functioning (EF) and personality traits can be tested. The students are also currently taking their courses online due to the implementation of COVID-19 pandemic movement restrictions and social distancing measures. The samples are taken from students at the age of 18 and above, which specifically on 1<sup>st</sup> year students in UNIMAS and the sample size calculated is 140 students. Convenience sampling is chosen because they are easily accessible and from the same region as the researcher and there is limited time for a research process as well. Moreover, these students are staying at home due to the pandemic, it will be easier to get in touch with them through online chat group or any other social media. The decision for this specific title is to get to know their ways of managing their mental state during this tough situation where they cannot engage in face to face with their educators. Therefore, it

will gain more insight how they can dive into this research to help the researcher to observe whether the validity of MBTI result to examine their executive cognitive functions. These factors may have a strong effect on their result as well. The sampling procedure used is simple random sampling. Anyone belonging to the sample group has an equal and independent chance of being randomly chosen as a research participant. This method is chosen because it is faster to gather samples and there are no requirements for strata.

### **3.3 Inclusion & Exclusion Criteria**

Since the population that the researcher choose is 1<sup>st</sup> year students and the age is not restricted towards the students are from 1<sup>st</sup> year batch. The population choose is random from all faculties in UNIMAS. Therefore, if a student did not require one of the criteria stated, their result shall be dismissed due to irrelevant population criteria. The participant must require all the criteria stated by the researcher. MBTI knowledge before taking the survey form is not required since the survey form already require a student to get their MBTI result by the question provided.

### **3.4 Data Collection Procedure**

Data collection is performed through Google Forms. Google Forms are used because it does not require any cost and allows better reach as people have limited contact during this COVID-19 pandemic. The links for the forms are disseminated to the secondary school students through WhatsApp groups or friend groups through referral of two gatekeepers who have direct access to these groups. After clicking the link, they will be brought to the front page of the Google Forms questionnaire. Participants are required to read through the research objectives and ethical considerations before proceeding forward. They are also asked to provide honest answers, however they can ignore any questions they do not want to answer. The email addresses of the researchers are given in case they need clarification for any of the questions. When participants have submitted the form, Google Forms will automatically display the data in pie charts and graphs. Every individual response can be seen, and all responses can be downloaded as a Microsoft Excel file. When the number of responses has

reached the required sample size, any further submission is disallowed. The MBTI section will be analysed and divided into groups manually by a researcher based on the question and answer given by the participants and MBTI characteristics from “16 personalities” official website.

Before starting the questionnaire, participants are briefed on research objectives and what the research is used for. In this context, it is used to fulfil the requirements of the participants to take the personality test which prepared by the distributor.

Furthermore, the findings of the study can help to identify how MBTI can be an efficient tool to measure the executive cognitive function among the study population, as well as suggest ways to improve their learning. Participants are made aware that they are not being forced to answer their willing to join the participation is completely voluntary. The identity of participants will be kept anonymous. No sensitive information such as names, e-mail addresses or identity card numbers will be relevant in data collection. If they experience discomfort to answer any of the questions or feel that it is too personal to share, they allowed to ignore them. Participants are free to drop out at any point in the questionnaire should they wish to leave. Lastly, they are thanked for their cooperation and contribution to the study.

### **3.5 Data Analysis Procedure**

The data from the questionnaire responses are entered into IBM SPSS Statistics 25 software for tabulation and analysis. Descriptive analysis is performed on the data in Section A such as demographic and MBTI, followed by section B until section E which includes, time management, emotional regulation skills, memory functioning, and self-motivation by observing the frequencies and mean. The results of each range in the Likert scale of Section B, C, D, and E, are also described in a similar manner. Each section will be visualized into pie charts and bar graphs. Associations between variables are observed and interpreted using inferential analysis. The relationship between gender & EF and relationship between gender and self-motivation are by using the Independent T-test because gender is a nominal data. The relationship between EF, MBTI, gender, and self-motivation are measured by using the regression test.

The instrument used for collecting data in this study is an online questionnaire. The questionnaire is divided into 5 sections: A, B, C, D, and E. Section A consists of multiple-choice questions and short answers, given the questions about gender, MBTI. For section B until E, it consists of emotion regulation, memory functioning, time management, and self-motivation and Likert scale will be used for the sections. Participants are not allowed to not divulge their gender by choosing the 'Prefer not to say' option. These questions are relevant to determine correlations between gender and EF, gender and self-motivation, and EF, MBTI, gender, and self-motivation.

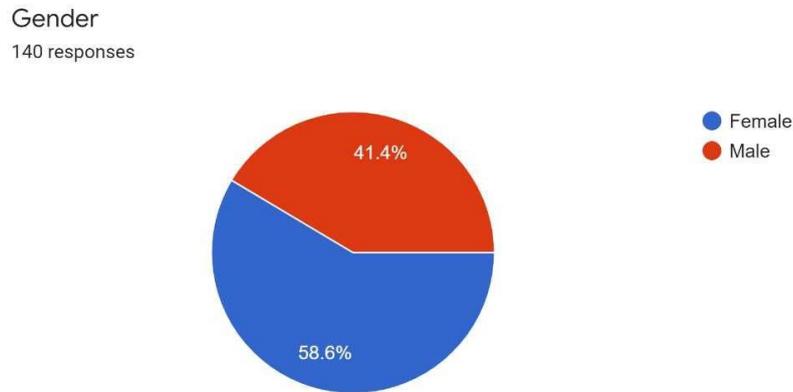
Questions in section A is to find out the personality types (MBTI) of each participant before they can proceed to the next section. This is a vital section as for the data collection is mainly for the objectives of this research. Section B, section C, section D, and section E, are for assessing the magnitude of executive functions of participants towards their learning. They are in the form of five-point Likert Scales. The scale for statements in Section B until E, are frequency-related, ranging from '1-Never', '2-Rarely', '3-Sometimes', '4-Often' and '5-Very Often'. These questions were extracted from the Myers-Briggs Type Indicator Test, Emotion Regulation Skills Questionnaire developed by Mirabile (2014), Memory Functioning Questionnaire (MFQ) developed by Gilewski (2014), Self-Motivation test by Kubischta (2014), and Time Management Personal Assessment by Wayne State University (2007). They have been adapted to fit the context of the research objective and topic to ensure participants can understand and relate to the questions (Appendix).

## **4.0 Result & Analysis**

### **4.1 Descriptive**

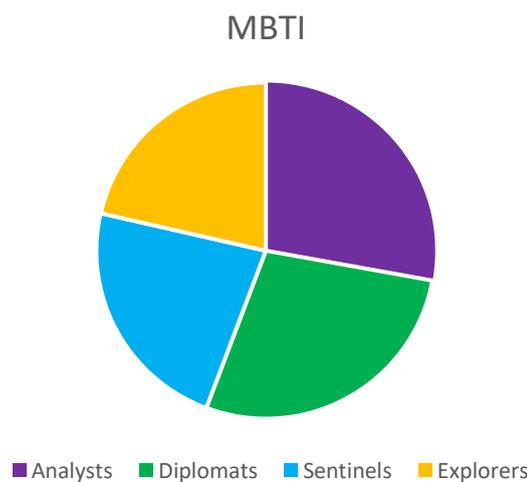
This section will discuss and explain about the executive functions of learning capability in MBTI among 1<sup>st</sup> year students in UNIMAS. The data collected through an online survey and 140 participants of 1<sup>st</sup> year students from different faculty and able to complete the survey within the time given. No range age of the students between years as long as the student fulfill the requirement as 1<sup>st</sup> year student. For the gender, there are 82 female students, and 58 male students contribute this research. The result will be analysed and interpreted with three different tests in Statistical Package for the Social Sciences (SPSS), which is independent *t*-Test and One-way

ANOVA, and multiple regression. Under the survey questionnaire, the section divided into three which is Myers-Brigg Type Indicator (MBTI), executive functions (EF) and self-motivation (SM).



**Diagram 1: Percentage of Participants in Gender**

After the survey collected, the variables will be tested with two inferential data analysis and divided into three sections for independent *t*-test, One-way ANOVA, and multiple regression. Independent *t*-test used to compare the executive functions (EF) and self-motivation (SM) based on gender. One-way ANOVA used to compare the executive functions (EF) and self-motivation (SM) based on MBTI. Multiple Regression to predict the relationship between the independent variables which includes Myers-Brigg Type Indicator (MBTI), gender and self-motivation (SM) and the dependent variables which is executive functions (EF).



**Diagram 2: Percentage of MBTI**

**4.2 Analysis (Inferential)**

**4.2.1 Independent T-Test**

**H01: There is no significant difference in executive functions (EF) of 1<sup>st</sup> year students in UNIMAS in terms of gender.**

Group Statistics					
	Gender	N	Mean	Std. Deviation	Std. Error Mean
Executive Functions (EF)	Male	58	3.5538	.57319	.07526
	Female	82	3.3924	.41564	.04590

**Table 1: Independent T-test between EF and Gender**

Independent Samples Test										
		Levene's Test for Equality of Variances				t-test for Equality of Means				
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Executive Functions (EF)	Equal variances assumed	9.979	.002	1.931	138	.055	.16136	.08354	-.00383	.32655
	Equal variances not assumed			1.830	97.768	.070	.16136	.08816	-.01359	.33630

**Table 2: Independent T-test between EF and Gender**

Dependent variable is measurable. So, this one the dependent variables are Executive Functions with score scale measurement 1-5. The nearest the score to 5, the good executive functions will be. Independent variables consist of gender, MBTI, and self-motivation. The objective of the study is to determine if there will be relationship between executive functions (EF) of learning capability and gender. It was

hypothesized that the score of executive functions (EF) of learning capability will have no differences between male and female. To test this hypothesis, an independent samples t-test was conducted. Result reveals that executive functions (EF) of learning capability not significantly associated between male and female.

Based on Table 1, result shows the score of mean and standard deviation between executive functions (EF) and gender. Result reveals that executive functions (EF) of learning capability not significantly associated between male ( $\mu = 3.55$ ,  $\sigma = 0.57$ ) and female ( $\mu = 3.39$ ,  $\sigma = 0.42$ ),  $t(138) = 1.931$ ,  $p = .055$ . The effect size is small (Cohen's  $d = 0.328$ ). Based on Table 2, the value of sig. (2-tailed) between executive functions and gender is larger than [ $p = 0.05$ ]. Hence, fail to reject the null hypothesis. Therefore, the group mean is statistically having significance different. Thus, this finding suggests that gender is unlikely contributed to determine the executive functions (EF) on learning capability among 1<sup>st</sup> year students in UNIMAS.

**H02: There is no significant difference in self-motivation (SM) of 1<sup>st</sup> year students in UNIMAS in terms of gender.**

Group Statistics					
	Gender	N	Mean	Std. Deviation	Std. Error Mean
Self-Motivation	Male	58	3.2709	.38003	.04990
	Female	82	3.2718	.49823	.05502

**Table 3: Independent T-test between EF and Gender**

Independent Samples Test										
		Levene's Test for Equality of Variances			t-test for Equality of Means					
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Self-Motivation	Equal variances assumed	8.330	.005	-	138	.991	-.00084	.07775	-.15457	.15289
	Equal variances not assumed			-	137.171	.991	-.00084	.07428	-.14772	.14604

**Table 4: Independent T-test between EF and Gender**

Table 3 shows the score of mean and standard deviation between self-motivation (SM) and gender. For self-motivation, female obtain higher score in mean ( $\mu$ ) and standard deviation [ $\mu = 3.2718, \sigma = 0.50$ ], than male [ $\mu = 3.2709, \sigma = 0.38$ ]. Table 4 shows the value of sig. (2-tailed) between executive functions and gender is larger than [ $p=0.05$ ]. Hence, fail to reject the null hypothesis. Therefore, the group mean is statistically having no significance different. Thus, it shows this finding suggests self-motivation unlikely contributed to determine the executive functions (EF) on learning capability among 1<sup>st</sup> year students in UNIMAS.

**4.2.2 One-Way ANOVA**

The purpose of this study is to determine whether there are significant differences in the executive functions (EF) of 1<sup>st</sup> year students in UNIMAS across different type of Myers-brigg indicator. It was hypothesized that explorers would have higher score in executive functions on learning capability compared to analysts, diplomats, and sentinels. The collected data were analysed using the between-subject one-way ANOVA.

**H03: There is statistically significant mean difference in Myers-brigg type indicator (MBTI) and executive functions (EF).**

Descriptives								
Executive Functions (EF)								
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
ANALYSTS	39	3.4570	.45872	.07345	3.3083	3.6057	2.65	4.53
DIPLOMATS	39	3.4630	.46243	.07405	3.3131	3.6129	2.71	4.59
SENTINELS	32	3.2408	.43723	.07729	3.0832	3.3984	2.18	4.59
EXPLORERS	30	3.6902	.53911	.09843	3.4889	3.8915	2.47	4.59
Total	140	3.4592	.49169	.04156	3.3771	3.5414	2.18	4.59

**Table 5: Anova Test between EF and MBTI**

**Test of Homogeneity of Variances**  
Executive Functions (EF)