



Faculty of Cognitive Sciences and Human Development

**The Role of Metacognitive Awareness and Procrastination on Academic
Achievement among Undergraduate Psychology students in UNIMAS**

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Bachelor in Psychology (Honours)

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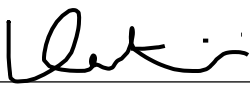
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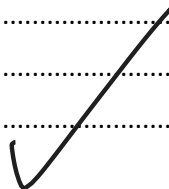
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ABSTRACT

This study aimed at identifying the relationship between metacognitive awareness and procrastination on academic achievement among undergraduate psychology students at

UNIMAS. In recent years, ~~much~~ metacognitive and procrastination research has been

done ^{in many Western countries} within the field. However, there is a need for more metacognition studies to be

^{also be conducted}

~~done~~ in non-Western countries and further studies on procrastination due to its ^{inconsistent} ~~mixed~~

^{findings} ~~results among researchers~~. This study employs correlational quantitative research using

two instruments: the Metacognitive Awareness Inventory by Harrison and Vallin (2018)

and the Procrastination Assessment Scale-Students, developed by Rothblum and

Solomon (1984). A total of 150 samples were successfully collected and analysed using

the Spearman rank correlation coefficient. The results found that the relationship

between metacognitive awareness, procrastination, and academic achievement was not

significant. This study implies a need for culturally adaptable instruments and a push

for personalised intervention programs. Future studies should consider mixed-method

research, experimental research design, and employs a larger sampling size for

generalizability.

Keywords: metacognitive awareness, procrastination, academic achievement

ABSTRAK

Kajian ini bertujuan untuk mengenal pasti hubungan antara kesedaran metakognitif dan penangguhan tugas terhadap pencapaian akademik dalam kalangan pelajar sarjana muda Psikologi di UNIMAS. Kebelakangan ini, banyak pengkaji telah melakukan penyelidikan berkaitan metakognitif dan penangguhan tugas. Walau bagaimanapun, lebih banyak kajian metakognitif perlu dilakukan di luar negara Barat. Selain itu, kajian lanjut mengenai penangguhan tugas perlu dilakukan kerana hasil kajian yang tidak konsisten di kalangan penyelidik. Kajian ini menggunakan penyelidikan kuantitatif korelasi yang menggunakan dua instrumen: Metacognitive Awareness Inventory yang diciptakan oleh Harrison and Vallin (2018) dan Procrastination Assessment Scale-Students, yang diciptakan oleh Rothblum and Solomon (1984). Sebanyak 150 sampel telah berjaya dikumpul dan dianalisis menggunakan Ujian Korelasi Rank Spearman. Keputusan menunjukkan bahawa hubungan antara kesedaran metakognitif, penangguhan tugas dan pencapaian akademik adalah tidak signifikan. Kajian ini membawa kesedaran tentang keperluan instrumen yang boleh digunapakai tidak kira budaya dan keperluan program intervensi peribadi. Kajian akan datang haruslah mempertimbangkan kajian kaedah campuran, kajian eksperimental dan menggunakan persampelan saiz yang lebih besar untuk tujuan generalisasi.

Kata kunci: kesedaran metakognitif, penangguhan kerja, pencapaian akademik

CHAPTER ONE

INTRODUCTION

1.0 Introduction

The first section of the report includes background of study, problem statement, research objectives, research questions, research hypothesis, conceptual framework, significance of study, definition of terms and a summary of the whole chapter.

1.1 Background of Study

Learning is an important process that every human being goes through. Learning can occur in many ways. Whether we are merely observing another person's action or through association, we never stop learning, directly or indirectly. Assessment of learning occurs in a variety of ways. One commonly used form of assessment is the use of a final examination. For example, it is compulsory for university students to sit for their final exam.

For students to be able to learn successfully, various factors come into play. One of the factors is the ability to use metacognition. According to Brame (2019), metacognitive students must know how to do three things during the learning period. The three things are being in control of their own learning by organising, supervising, and assessing. Being in control of their own learning is beneficial. For example, autonomy in the classroom increases students' learning engagement (Parrish, 2022).

However, successful learning is not as easy as it seems. Challenges may come along the way. The challenge that is often mentioned in a student's academic life is procrastination. It can occur due to factors such as lack of motivation or even perfectionism (Abbasi & Alghamdi, 2015). Delaying a task, intentional or unintentional, can have a possible negative outcome on the learning process. Recognising the impact of procrastination on learning is important. Hence, there is a need to understand more regarding the topic of procrastination.

Academic Achievement

The end goal of learning for students is academic success. Academic achievement is evaluated differently, depending on the level of education. Commonly, the cumulative grade point average (CGPA) determines a student's level of academic achievement in higher education.

Students own role in learning should not be overlooked. They have a bigger, if not the biggest, role in successful learning. Chan and Dai (2023) found that among university students, students' participation is important for their academic achievement. The researchers also find general knowledge and social skills to be contributing factors to students' academic achievement. The study finally concludes that interaction with other students and faculty members is important to achieve academic success.

However, past studies have focused on students' academic achievement based on interactions with others. Therefore, in this study, the researcher wants to understand how a student can

independently manage their learning without any external influence. Hence, the role of metacognition is analyzed.

Metacognition

Metacognition is defined as the ability to examine one's own thought process (Jaleel & P., 2016). Metacognitive awareness is defined as being conscious of your own thought process (Jaleel & P., 2016). For instance, a student summarises what they have learned from their textbook. The student will identify which part of the subject they had trouble with. To improve this, they will ask their peers or lecturers for further clarification. This will improve their understanding of the subject.

Past research has been done on metacognition, specifically metacognitive awareness and academic achievement. A study by Sawhney and Bansal (2015) titled Metacognitive Awareness of Undergraduate Students in Relation to Their Academic Achievement found that those with higher metacognitive awareness tend to have better academic achievement. This finding is consistent with the findings by Iqbal et al. (2019) and Hossain and Chowdhury (2019). All three studies have acquired a similar methodology, wherein a survey (metacognitive awareness inventory), a descriptive survey (meta-cognition inventory), and a semi-structured questionnaire (metacognitive awareness of reading strategies inventory) have been used, respectively. In conclusion, this consistent finding highlights the importance of metacognitive awareness for academic achievement.

These studies have shown that metacognitive awareness and academic achievement are positively correlated. Yet, there is a need for more metacognitive studies in non-western countries, as stated by Coutinho et al. (2020). Therefore, this study is needed to add more findings about metacognition in the Asian context.

Procrastination

Steel (2007) defines procrastination as knowing the negative outcome of postponing an intended action yet still choosing to delay it. An estimate of 80% to 95% of college students procrastinate (Ellis and Knaus, 1977).

Past studies demonstrate several types of procrastinators. According to McRoberts (2013), there are two types of procrastinators: perfectionists and crisis-making procrastinators. McRoberts (2013) found that most students in college are crisis-making procrastinators, wherein these procrastinators deliberately wait until the last minute to do their work. For example, although students are given course planning that includes deadlines for assignments during the first two weeks of the semester, some students do not start their work until the week that they were supposed to hand in the assignment.

Procrastination occurs due to various factors, such as the deadline, which is still far ahead, and the observation and imitation of others behaviour (Svardal et al., 2020). Procrastination, although it may not seem as serious on the surface, is related to both mental and physical problems. It is specifically related to depression, anxiety, stress, health issues, and negative

lifestyle behaviours (Johansson et al., 2023). If the individual does not change their procrastination habit, it may lead to a loss of productivity in their work and academic matters.

Therefore, although students have the autonomy to do whatever they want with their own time in university, not knowing how to manage their time properly may have an adverse impact. Hence, a study on the relationship between procrastination and academic achievement is needed.

1.2 Problem Statement

Coutinho et al. (2020) state that there is a need to conduct more studies on metacognition in non-Western countries. This is because it can help in understanding the metacognitive theory better when different cultures have different perspectives from Western countries (Coutinho et al., 2020). Hence, with this study, the researcher aims to contribute to the understanding of metacognition within the context of the Asian region.

Additionally, Cheng et al. (2023) stated that there is an inconsistency in the existing findings between procrastination and academic achievement. This study will then be able to verify or challenge existing findings regarding the relationship between procrastination and academic achievement.

In a nutshell, the main goal of this research is to understand the relationship between metacognitive awareness, procrastination, and academic achievement. The researcher is only

focusing on first-, second-, and third-year psychology students due to methodological limitations.

1.3 Research Objectives

1.3.1 General Objective

To identify the relationship between metacognitive awareness and procrastination on academic achievement among undergraduate psychology students in UNIMAS. ✓

1.3.2 Specific Objectives

- i. To identify the relationship between metacognitive awareness and academic achievement among undergraduate psychology students in UNIMAS.
- ii. To identify the relationship between procrastination and academic achievement among undergraduate psychology students in UNIMAS.



1.4 Research Questions

- i Is there a significant relationship between metacognitive awareness and academic achievement among undergraduate psychology students in UNIMAS?
- ii Is there a significant relationship between procrastination and academic achievement among undergraduate psychology students in UNIMAS? ✓

1.5 Research Hypotheses

The hypotheses for this study will be:

i H_0 : There is no significant relationship between metacognitive awareness and academic achievement.

H_1 : There is a significant relationship between metacognitive awareness and academic achievement.

i H_0 : There is no significant relationship between procrastination and academic achievement.

H_1 : There is a significant relationship between procrastination and academic achievement.

1.6 Conceptual Framework

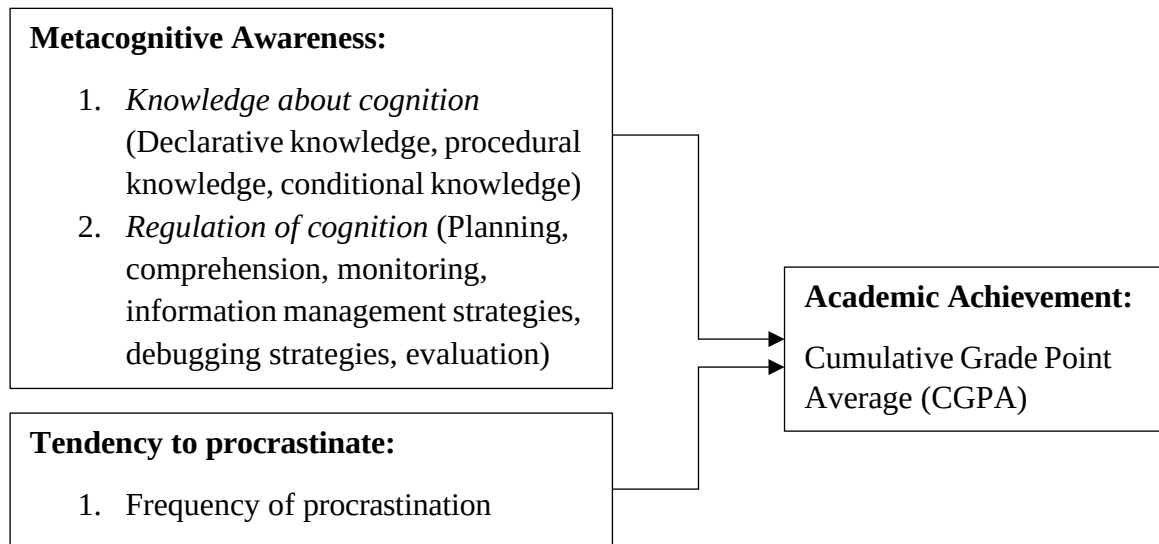


Figure 1.6. Conceptual Framework of the study

Figure 1.6 shows the variables that will be studied which are metacognitive awareness, procrastination and academic achievement. The dependent variable is academic achievement. The independent variables are metacognitive awareness and tendency to procrastinate.

1.7 Significance of Study

Metacognitive learning can help enhance the concept of holistic learning introduced by the United Nations Educational, Scientific, and Cultural Organization (UNESCO). Under the core of truth and wisdom lies the value of critical thinking (United Nations Educational, Scientific, and Cultural Organization, 2002). According to Rivas et al. (2022), the researchers found that to further enhance an individual's critical thinking, they must be well aware of their own cognitive processes. By integrating metacognitive awareness into educational practices, especially in higher education, we have successfully utilised UNESCO's holistic learning.

The findings of this study can contribute to the knowledge of cognitive psychology and educational psychology by providing empirical evidence. Specifically, understanding the complex relationship between metacognitive awareness, procrastination, and academic achievement.

This study on metacognitive awareness and procrastination can greatly benefit both students and teachers. Learners would be able to be more conscious of their metacognition. Using the metacognitive awareness inventory that is provided to the students, they can use it from time-to-time to observe any changes regarding their metacognitive awareness. This can benefit students, as they will know where their weaknesses lie. Hence, they will seek to improve themselves. On the other hand, teachers can use the metacognitive awareness inventory to

understand their students' level of awareness. Those who scored low in this inventory should be provided with guidance on how to enhance their metacognitive awareness. In addition, teachers can integrate the use of metacognition into their teaching.

The findings of this study can inform the human resources development department regarding the prevalence of procrastination. Specifically, they can be aware of potential issues regarding fresh graduates who have been newly hired into their company. These fresh graduates may still have the habit of procrastinating during their academic days. The involved department can create a training plan that aims to acknowledge the issue and combat it. Therefore, it can greatly improve the productivity of a workplace.

This study can help to look over and restructure educational policies, even at a lower educational level. Higher and lower educational levels, such as primary and tertiary schools, can collaborate to create a curriculum with the integration of metacognition. However, it has to be adaptable to all levels of education. This will allow students from a young age to understand their own thought processes, which can be transferred to the next level of education or even into their workplace.

1.8 Definition of Terms

1.8.1 Academic Achievement

Conceptual Definition: According to Tian & Sun (2018), academic achievement is defined as “students’ learning outcome of a school curriculum.”.

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Operational Definition: For the purpose of this study, academic achievement will be defined as the cumulative grade point average (CGPA) that has been obtained up to the previous semester (semester 1 2023/2024) in UNIMAS from the first year of study.

1.8.2 Metacognitive Awareness

Conceptual Definition: According to Ridley et al. (1992), metacognitive awareness is defined as “...the process of using reflective thinking to develop awareness about one’s own person, task, and strategy knowledge in a given context.”

Operational Definition: For the purpose of this study, the measurement for metacognitive awareness will be taken from the Metacognitive Awareness Inventory which assesses the respondent’s metacognitive awareness using 19 items. Two categories are assessed. The first category is knowledge about cognition (declarative knowledge, procedural knowledge and conditional knowledge). The second category is regulation of cognition (planning, comprehension monitoring, information management strategies, debugging strategies and evaluation). This study focuses on the overall assessment of metacognitive awareness rather than its sub-categories.

1.8.3 Procrastination

Operational Definition: According to Gargari et al. (2011), procrastination is defined as “...a way to avoid or escape from undesirable tasks.”

15

Operational Definition: For the purpose of this study, procrastination will be measured by using the Procrastination Assessment Scale-Students which is used to measure their frequency of procrastination.

1.9 Summary

To conclude this section, this study focuses on three aspects, which are metacognitive awareness, procrastination, and academic achievement. It is crucial to understand the relationship between these three variables because of their importance in academic contexts. Hence, this study aims to contribute a unique insight into understanding the complex minds of undergraduate psychology students.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This section discusses theories and past studies related to learning, metacognitive awareness and academic achievement, and procrastination and academic achievement.

2.1 Learning

Learning is an essential stage of human life. Learning does not stop when an individual finishes their educational years. It continues until the end of their lives. Learning helps individuals become more knowledgeable, solve problems, and create something new, which are crucial for human survival. Ergo, in this subtopic, the researcher will explore the topic of learning by using past research that has been published.

Learning can take the form of both formal and informal education. Formal education is conducted through schools. The parents of a child can opt for either a government school or a private school. In Malaysia, under the Education Law (1996), Section 29(A), it is compulsory by law for individuals to receive primary education (Ministry of Education Malaysia, 2012). This law requires Malaysian parents to register their children for primary education. The child then continues to get their compulsory education for another six years. Later on, the parents can decide whether or not to let their children continue their education in secondary school. Informal education is learning that happens beyond a school's formal system of education (Khasnabis et al., 2010). Informal education can occur in many places. For example, learning can happen in the home environment of a child. The child observes the behaviour of his or her

family and learns to model. Therefore, it is safe to say that learning can happen anywhere and anytime and is not limited to school settings.

Learning can be affected by a variety of factors. One of them is the learning environment. To understand this, an article titled the influence of undergraduate students' academic involvement and learning environment on learning outcomes by Lu et al. (2014) will be used. The researchers aim to identify how the results of learning are affected by their learning environment and academic participation. The researchers used a questionnaire named Xi'an Jiaotong University Undergraduate to analyse the relationships between the variables. They found that for university students, the learning environment is a strong factor that influences learning outcomes. It even has a stronger influence than the campus climate. Additionally, learning environment is observed to affect a student's participation, satisfaction, and cognitive development skills. Finally, the researcher emphasises the importance of creating a conducive environment to maximise students learning outcomes.

To summarise this subtopic, humans go through a process called learning, both formally and informally. In the context of a student, they want to achieve what is considered good or high academic achievement. This outcome is influenced by many factors, including environmental factors. Therefore, the researcher in this study wants to contribute to the knowledge that encourages better learning outcomes for students through the students' own efforts.

2.2 Metacognitive Awareness and Academic Achievement

When discussing learning and academic achievement, metacognition is one of the elements that is frequently mentioned. In this literature review, the researcher will be exploring the theory of metacognition and past research that has been conducted on metacognitive awareness and academic achievement.

Nelson and Narens (1994) highlight the importance of researching metacognition, as studies on human learning have overlooked self-directed processes. According to Nelson and Narens (1994), one of the most important aspects of cognition is metacognition. Thinking about thinking connects many domains of cognition, such as learning, memory, and decision-making. Metacognition is also important for academic matters because it involves cognitive processes, as mentioned previously, which are frequently used in exams, quizzes, and other assessments. Kuhn and Jr. (2004) suggest a collaboration between teachers and researchers regarding metacognition to enhance students' development. They propose two ways of encouraging metacognition development among students: reflecting and internalizing. It allows students to be more engaged with what they have learned.

2.2.1 Theory related to metacognition

One well-known framework on the topic of metacognition is Flavell's model of metacognition. There are four important components of metacognitive monitoring: metacognitive knowledge, metacognitive experiences, goals or tasks, and actions or strategies (Flavell, 1979). Metacognitive knowledge, also known as the understanding of how the elements—person, task, and strategy—interact, can influence cognitive processes and outcomes. For example, student

A has a different approach to studying than student B, even though they are taking the same final exam. In this example, it portrays the different strategies used by different individuals, even though the task is essentially the same. Metacognitive experience, on the other hand, is awareness of emotions and cognition while doing something that requires brainpower (Flavell, 1979). For example, a student feels frustrated when they are not able to get an answer right. Both metacognitive knowledge and metacognitive experiences are important, especially in the field of education. Students must be able to make use of their thinking so that they can gain a deeper understanding of what they have learned. It also encourages them to question themselves, which encourages further critical thinking.

2.2.2 Previous findings on metacognition

Past research has shown that metacognitive awareness has a significant relationship with academic achievement (Abdellah, 2015; Abdelrahman, 2020). The study by Young and Fry (2008) analyses the relationship between metacognitive awareness and academic achievement among both undergraduate and postgraduate students. The objective of their study was to delve deeper into understanding the relationship between metacognitive awareness and both overall and specific academic performance. A few significant findings were highlighted in their study. Firstly, both factors—knowledge of cognition and regulation of cognition—had a significant relationship with each other. Secondly, there is a significant relationship between overall academic performance (cumulative grade point average) and metacognitive awareness. Thirdly, both factors—knowledge of cognition and regulation of cognition—had a significant relationship with the specific measurement of academic performance. The author highlights the need for a larger sample for future research and interventions involving the Metacognitive Awareness Inventory in classroom settings. The study has helped provide a better

understanding of the relationship between metacognitive awareness and academic performance. However, the author highlights that this study has limitations in terms of generalizability, that it is not inclusive of all academic levels, and the presence of extraneous factors. Although this study was dated, other recent findings (Ward & Butler, 2019; Özçakmak et al., 2021) have found similar results in which academic performance is related to the level of metacognitive awareness.

Academic involves the use of language. Past studies have found that metacognitive awareness is influential in language learning. A meta-analysis study was conducted by In'nami et al. (2022) titled examining second language listening and metacognitive awareness: A meta-analytic structural equation modelling approach. The researchers used 29 studies to be analysed. The researchers aim to analyse how metacognitive awareness affects second-language listening comprehension skills. They found that there is a positive correlation between metacognitive awareness and second-language listening skills. However, the researchers acknowledge the limitations of their study. The limitations are: the researchers are not sure which of the two model (Goh's higher-order model of metacognitive awareness or Vandergrift's five strategy model) is more suitable for their data; moderating variables are not taken into account in this study; and a limited number of valid studies could be used. Therefore, through this research, metacognitive awareness influence could be seen in positively influencing students' listening skills.

Besides language learning, metacognitive awareness is also influential in mathematical subjects. A research titled problem-solving skills, metacognitive awareness, and mathematics

achievement: A mediation model by Hassan and Rahman (2017) will be used to explain the statement. They aim to understand the role of metacognitive awareness as a mediator between problem-solving skills and mathematical achievement. There are three significant findings in their study: metacognitive awareness and problem solving are highly related; metacognitive awareness and mathematics performance are highly related; and metacognitive awareness acts as a mediator between problem solving and mathematical performance. Hence, the researchers state that their study is important for educational practices. Specifically, in terms of developing students' metacognitive awareness, both teachers and students play a role in developing their metacognitive awareness. While students are urged to develop their metacognitive awareness and problem-solving skills, teachers are urged to implement metacognitive elements into their teaching.

Wong (2012) stated that most Western countries are the ones who conduct studies on metacognition. Hence, there is a need for more research on metacognition in non-Western countries (Coutinho et al., 2020). To fill in this gap, the researcher's objective is focused on identifying the relationship between metacognitive awareness and academic achievement. This will contribute to the findings on metacognition in the Asian region.

This study methodologically adapted Wong (2012) and Siddiqui et al. (2020) research, which also use the same assessment method, the metacognitive awareness inventory. While both studies use the original 52-item instrument, this study uses the newer, adapted version with 19 items. The importance of using the metacognitive awareness inventory is to explore its reliability and validity within the Southeast Asian region. This is because the metacognitive

awareness inventory also originated in a Western country. Additionally, an American named John Flavell created this questionnaire. Therefore, using a similar questionnaire in this study demonstrates cross-cultural applicability and ensures that the questionnaire is not ethnocentric. If the questionnaire is applicable in the Southeast Asian region, it can be a useful method for metacognitive intervention in terms of educational practices. Lastly, the researcher aims to contribute to more inclusive findings in the field of metacognition.

2.3 Procrastination and Academic Achievement

As students have more autonomy in university, it can also lead to what is usually perceived as negative behaviour: procrastination. Procrastination is the act of delaying things. Procrastination occurs in adults, regardless of whether they are students or working adults. It is an issue that occurs across cultures in all kinds of settings. In the academic world, procrastination among students can lead to various negative consequences, such as lower academic performance and a higher stress level (Kuftyak, 2022). In the working world, procrastination leads to lower productivity (Nguyen et al., 2013; Jha & Singh, 2023) and a higher rate of unemployment (Nguyen et al., 2013).

2.3.1 Theory related to procrastination

Temporal motivation theory by Steel and Konig (2006) can be used to explain procrastination. Temporal motivation theory is created by using other established theories as its foundation. The other theories that are used are piceoeconomics, expectancy theory, cumulative prospect theory, and need theory. According to Steel and Konig (2006), the fundamental features of temporal motivation theory are "...value, expectancy, time, and different functions for losses

versus gains.”. This theory is used to explain procrastination because it emphasises the importance of time. For example, students will delay a task given to them earlier if the deadline is still far ahead. Using this theory, the student’s behaviour could be explained by using the elements of sensitivity to delay. In this case, it reflects a student with low sensitivity to delay. On the other hand, a student with a high sensitivity delay will start work early, even if the reward (deadline) is not immediate.

2.3.2 Previous findings on procrastination

As the fundamental theory of procrastination has been explained, the researcher will look at past research to understand what has been done regarding the topic. Procrastination affects students academically. Past research has shown conflicting findings on students' procrastination and academic performance. In the journal article titled the impact of procrastination on engineering students' academic performance by Kim and Nembhard (2019), they investigated the effects of procrastination among engineering students at a university in the United States. The researchers wanted to investigate procrastination as a mediator. Besides that, the researchers also want to investigate the role of gender in the two variables. The authors created a conceptual model to explain the research findings. There are four elements in this conceptual model: early activity, time-pressure activity, underlying performance, and class performance. To maximise the authenticity of the data, the authors analyse and observe the engineering academic process through a course management website. They found that there is a correlation between improved academic performance and starting to study early. Besides that, gender differences among the four variables are observed. To conclude their study, the authors emphasised the importance of this study, highlighting its contribution to understanding engineering students' achievement and academic procrastination.

Additionally, in terms of the negative impact of procrastination, it also acts as a mediator in a student's academic life. To understand this statement, the article titled use of media and technology, academic procrastination, and academic achievement in adolescence by Türel and Dokumaci (2022) will be used. For their research, they used the quantitative survey research method. The questionnaires that they use are "the media and technology usage and attitudes scale" which was adapted and the academic procrastination behaviour scale. These questionnaires are then provided to middle and high school students. Their findings are: higher media and technology use leads to a higher procrastination tendency; academic procrastination behaviour serves as a mediator between media and technology use and academic performance. The researcher points out several limitations, such as generalizability, methodological limitations (quantitative), and other factors that are not taken into account (socio-economic factors and mental health issues). Hence, this study shows that even among adolescents, procrastination can act as a mediator between academics and technology, which leads to a worse grade outcome.

The studies previously discussed have been focused on the negative outcomes of procrastination. However, there are also findings that shows there are positive consequences to procrastination. The study by Chu and Choi (2005), titled rethinking procrastination: positive effects of "active" procrastination behaviour on attitudes and performance, shows some positive aspects of procrastination. In this study, the authors used the self-efficacy theory by Bandura to explain the concept of procrastination. The author's hypotheses consist of understanding the relationship between non-procrastinators, active procrastinators, and passive procrastinators. In addition, the authors hypothesise a few possible similarities between non-procrastinators and active procrastinators. Using a questionnaire named survey of university

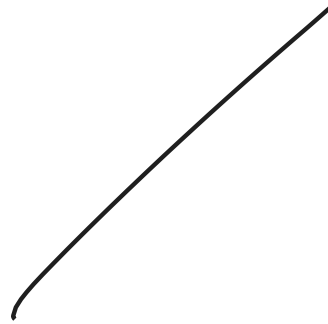
students' time use, which incorporated several established questionnaires, the authors were able to collect and analyse the data. This study finds that there are different types of procrastinators. Additionally, those who are categorised as “active procrastinators” shares positive characteristics similar to those who do not procrastinate. The authors suggested that future researchers investigate the underlying mechanisms behind the behaviour of different types of procrastinators. To add on, a recent meta-analysis conducted by Kooren et al. (2024) found that active procrastinators and academic achievement were positively correlated, but only so slightly. Both studies show evidence of positive effects of procrastination, specifically for “active procrastinators”. This adds on to a new perspective regarding the topic of procrastination, which is often said to be a negative concept yet, under the right conditions, has a positive effect.

As mentioned earlier, past researchers have shown conflicting findings on procrastination, with some highlighting the negative impact while others demonstrating its positive impact. These conflicting findings are commented on by Cheng et al. (2023). Therefore, the researcher aims to add to the existing study by contributing an understanding regarding the significance of the relationship between procrastination and academic achievement.

2.4 Summary

To summarise, there is a need for more research on metacognitive awareness. This is because the research is done mostly in Western countries. By conducting this research, it contributes to the knowledge regarding academic achievement and metacognitive awareness in the specific regional context. Eventually, this knowledge can help future researchers and teachers alike

understand the importance of metacognition learning in educational matters. Besides that, findings on procrastination will clarify the relationship between procrastination and academic achievement, which currently has conflicting findings.



CHAPTER THREE

METHODOLOGY

3.0 Introduction

The third section includes methodology. This section discusses the research design, population and sample, instruments, procedures, pilot study, data collection procedure and data analysis procedure that is used to conduct the research.

3.1 Research Design

This research is quantitative research which involves numbers and assumes that said occurrence can be measured (Watson, 2015). Statistical analysis is exclusive to this research design. The collected data will then be examined for patterns and associations between the variables. This strategy is also used to validate the measurements that have been made. According to Watson (2015), quantitative is deductive because conclusions are reached after measuring and analysing the data.

To be more specific, this research is correlational quantitative research. According to Leedy (2016), correlational studies are used to expect and predict variable changes when there is a change in another variable. This study is done to understand if the variables are related and how they are related to one another. In this research, the researcher wants to investigate if metacognitive awareness, procrastination, and academic achievement are related. Besides that, based on the authors' description, the researcher expects changes between metacognitive awareness, procrastination and academic achievement when any of the variables experience

change. However, Leedy (2016) states that correlational studies do not equate to cause-and-effect.

Survey research is used for this research. Gathering information about at least one group by asking them some questions and organising the answers is what is considered as survey research (Leedy, 2016). The researcher will adopt and adapt two questionnaires: the Metacognitive Awareness Inventory (MAI) and the Procrastination Assessment Scale-Students (PASS), respectively.

3.2 Population and Sample

3.2.1 Population of Psychology students in UNIMAS

A group of people is a population (Bowling & Ebrahim, 2005). The research population consists of undergraduate psychology students at UNIMAS. The total population is approximately 240 (excluding the fourth year). Only first-, second-, and third-year students are eligible to participate in this questionnaire. This is because the fourth-year students will be conducting their internship all over Malaysia for the upcoming semester, while the data collection method is pen and paper. Therefore, it is not feasible to do so.

3.2.2 Sample size

Sampling saves the duration of research, human resources, and assets (Bowling & Ebrahim, 2005). The researcher used convenience sampling for this research, which falls under the non-probability sampling category. According to Bowling and Ebrahim (2005), convenience

sampling is a group of people who happen to be at the same place at the same time. The researcher has chosen the undergraduate psychology students who are all studying at the same faculty, programme, and location.

To find the appropriate amount of sample by using the total population, the Krejcie and Morgan (1970) table is used. Their table indicates that for the total population of 240, the sample size should be 148. Below are lists of inclusion criteria for the sample:

1. Currently an undergraduate student studying psychology at UNIMAS.
2. First, second, or third-year psychology students.
3. Have at least one semester worth of cumulative grade point average.
4. Can read and understand English.

3.3 Instruments

Researchers gather data by using a certain tool in their research (Sathiyaseelan, 2015). One of the tools is a questionnaire, which is used for this research. Questionnaires gather personal perspectives, such as knowledge on a certain topic, and can be either closed or open-ended (Sathiyaseelan, 2015). Two questionnaires, the Metacognitive Awareness Inventory and the Procrastination Assessment Scale-Students, are adopted and adapted respectively to better fit the objective of the study.

3.3.1 Instrument Structure

There are three parts to the questionnaire. The first section is aimed at collecting demographic data such as age, gender, race, year of study, and cumulative grade point average (CGPA). The second section is aimed at collecting the frequency of procrastination by using the Procrastination Assessment Scale-Students by Solomon and Rothblum (1984). The third section is aimed at collecting the total metacognitive awareness of students by using the Metacognitive Awareness Inventory by Harrison and Vallin (2017). Both scales use the 5-point Likert scale.

3.3.1.1 Section A: Procrastination Assessment Scale-Students

The Procrastination Assessment Scale for Students was developed by Rothblum and Solomon (1984). The scale was developed to evaluate college students' procrastination habits based on the frequency of their cognitive and behavioural factors in the context of academic matters. This scale contains 52 items.

The scale contains two parts. The first part of the scale, which assesses the frequency of procrastination, is further divided into three types of questions. The first type of question is "To what degree do you procrastinate on this task?" which has a 5-point Likert scale: 1-never procrastinate, 2-almost never, 3-sometimes, 4-nearly always, and 5-always procrastinate. The second type of question is "To what degree is procrastination on this task a problem for you?" to which the Likert scale goes: 1-not at all a problem, 2-almost never, 3-sometimes, 4-nearly always, and 5-always a problem. The third type of question is, "To what extent do you want to decrease your tendency to procrastinate on this task?" which Likert scale goes from 1-do not

want to decrease, 3-somewhat, and 5-definitely want to decrease. Indicators for scales 2 and 4 were not stated in the manual. The second part of the scale, which assesses the reasons for procrastinating, has a 5-point Likert scale as follows: 1-Not at all reflects why I procrastinated; 3-Somewhat reflects; and 5-Definitely reflects why I procrastinated. The indicators for 2 and 4 were also not stated in the manual.

A reliability and validity test were conducted by the developers. A test-retest reliability study was conducted with a third of the developer's original sample and revealed an acceptable correlation coefficient of 0.57 ($p < .005$). Upon conducting a factor analysis, the developers found two main factors that the items load on: fear of failure and aversiveness of task. The validity of the scale is further explored by Yockey and Kralowec (2015), who conducted a confirmatory factor analysis. In the Yockey and Kralowec (2015) study, while there is a flaw in the two-factor model, it is the best option for the data collected using the scale.

3.3.1.2 Section B: Metacognitive Awareness Inventory

The Metacognitive Awareness Inventory was originally developed by Schraw and Dennison (1994). The questionnaire originally had 52 items, which were divided into two dimensions: knowledge of cognition and regulation of cognition.

The current questionnaire that is being used in this research is a shortened version of the original and was developed by Harrison and Vallin (2017). This test was developed to address the inconsistency of the scoring method of the questionnaire and to ensure the validity of the test in the context of today's time. Similarly, the researchers found that the two dimensions

(knowledge of cognition and regulation of cognition) as introduced by Schraw and Dennison (1994) fit the instrument well. However, while the original Metacognitive Awareness Inventory had 52 items, the current version had only 19 items after conducting the confirmatory factor analysis. The scale uses a 5-point Likert scale: 1-not at all typical of me, 2-not very typical of me, 3-somewhat typical of me, 4-fairly typical of me, and 5-very typical of me. The change from a 'Yes/No' scale in the original to the current 5-point scale is to obtain more accurate data, fit item constructs better, and reduce bias that may occur from using a true-false option (Harrison and Vallin, 2017). In regards to the construct validity of the instrument, Harrison and Vallin (2017) found that the knowledge-and-regulation model fits best and is correlated very highly to each other ($r = 0.84$).

A study by Thiagarajan et al. (2023) on metacognitive awareness uses the adapted Metacognitive Awareness Inventory. The study is conducted in India, an Asian region, similarly to the current study regional context. Their reliability test revealed a Cronbach alpha of 0.787, which shows an acceptable reliability result. The content's validity was then assessed by experts in the healthcare field. This shows that the instrument has evidence from researchers in a similar context in terms of reliability and validity, which makes it suitable for the current study.

3.3.1.3 Ethical Consideration

Ethics in research differentiates between good and harmful conduct in research (Wright, 2015). Additionally, on the paper that is distributed, before answering the questions, there is an informed consent that respondents must read. This informed consent form contains information

such as the purpose of the questionnaire, confidentiality, and voluntary participation. Respondents are exposed to the purpose of the study so that they know what they are getting involved in. For confidentiality, the researcher includes a disclaimer that no personal information will be obtained. Besides that, the data collected will only be used for the sole purpose of this research. Voluntary participation includes information on how being a respondent to the questionnaire is entirely voluntary, and they can withdraw anytime they want to. Furthermore, there are no consequences to choosing to withdraw.

3.4 Pilot Study

According to In (2017), pilot studies are crucial in research to avoid wastage of resources from both participants and researchers. The purpose of this pilot study is to assess the feasibility of the questionnaire. The adapted metacognitive awareness inventory had nineteen questions, while the procrastination assessment scale had forty-four. The total number of questions respondents would have to answer is sixty-one. If both of the original questionnaires are used, the number of questions may cause participant fatigue. Therefore, a pilot study is conducted to ensure that the questionnaire is manageable for the respondents by making it more user-friendly.

A pilot study was conducted with six students who were recruited from the Faculty of Cognitive Sciences and Human Development. By using the data collected from the six students, reliability and validity testing is conducted to ensure the appropriateness of the test in the current context. Additionally, improvements were made after feedback was received regarding the suitability of the Likert scale in the Procrastination Assessment Scale.

The acceptable reliability range is 0.70 and above (Taber, 2018). The Metacognitive Awareness Inventory shows an excellent reliability result with 0.92 for all nineteen items. So, all items were kept. The Procrastination Assessment Scale-Students, on the other hand, initially shows a low reliability result of 0.39. After removing item 3 (Writing a term paper: Do you want to decrease your tendency to procrastinate on this task?), 4 (Studying for exams: To what degree do you procrastinate on this task?) and 5 (Studying for exams: Do you want to decrease your tendency to procrastinate on this task?), an acceptable reliability result was achieved with a Cronbach alpha of 0.72. The final reliability result consists of 12 items.

Face validity is assessed for both questionnaires. Feedback was received from all respondents, and changes were made to the Likert scale for the Procrastination Assessment Scale-Students. The change was made after the respondents commented that the Likert scale did not align appropriately with the keywords of the item. Items under ‘To what extent do you want to decrease your tendency to procrastinate on this task?’ had responses ranging from 1-Do not want to decrease to 5-Definitely want to decrease, originally. The keyword ‘tendency’ expresses how much the respondents want to decrease their procrastination behavior. Therefore, the Likert scale was changed from 1-not at all to 5-extremely want to, which reflects the desire of the respondents more appropriately.

3.5 Data Collection Procedures

The pen-and-paper method is used to distribute the questionnaire. It is distributed to psychology students around the Faculty of Cognitive Science and Human Development. Respondents are expected to answer the questionnaire instantly. The collected data will then

be manually input into Statistical Package for the Social Sciences (SPSS) version 29. Once the input is successful, it will then be analysed using the same software.

3.6 Data Analysis Procedures

This study uses statistical analysis methods which are descriptive statistics and inferential statistics. To analyse the data, Statistical Package for the Social Sciences (SPSS) version 29 will be used.

3.6.1 Descriptive Data Analysis

The three different types of statistics are described. They are distribution (frequency), percentage, central tendency (mean) and variability (standard deviation).

3.6.2 Inferential Data Analysis

For inferential data analysis, the Spearman rank correlation coefficient is used, as both hypotheses are aimed at identifying the significance of the relationships between the variables: metacognitive awareness, procrastination, and academic achievement.

3.7 Summary

To summarise this chapter, the study employs quantitative correlational research. Two instruments are used, namely, the Metacognitive Awareness Inventory by Harrison and Vallin (2017) and the Procrastination Assessment Scale-Students by Solomon and Rothblum (1984). Informed consent was provided to respondents before they answered the questionnaire. A pilot

study was conducted with six students and tested for reliability and validity. Changes and adaptations were made to the Procrastination Assessment Scale-Students after feedback was received from pilot study respondents. Descriptive statistics (frequency, mean, and standard deviation) and inferential statistics (Spearman Rank Correlation Coefficient) will be used to analyse the data.

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CHAPTER FOUR

FINDINGS AND DISCUSSION

4.0 Introduction

In this chapter, statistical findings and analysis are discussed. 150 samples were collected and analysed. Descriptive statistics (frequency, percentage, mean, and standard deviation) and inferential statistics (Spearman Rank Correlation Coefficient) are used to discuss this section. Normality testing is also conducted to test the normality of the data.

4.1 Demographic Data

This section consists of respondents gender, age, race, year of study and cumulative grade point average.

4.1.1 Gender of Respondents

Table 4.1.1: *Frequency and Percentage of Respondents' Gender*

Gender	<i>n</i>	%
Male	31	20.7
Female	119	79.3
Total	150	100

Table 4.1.1 shows the descriptive statistics of the samples of gender collected. The researcher collected a total of 150 samples. There are 119 female respondents (79.3%) and 31 male respondents (20.7%).

4.1.2 Age of Respondents

Table 4.1.2: *Descriptive Table for Respondents' Age*

Age (Years)	n	%	M	SD
20	33	22.00		
21	50	33.33		
22	32	21.33		
23	18	12.00		
24	9	6.00		
25	4	2.67		
26	3	2.00		
27	1	0.67		
Total	150	100	21.66	1.48

Table 4.1.2 shows there are eight age groups that respond to the questionnaire. The age group with the least number of respondents is 27 years old with 1 (0.67%) respondent, followed by 26 years old with 3 (2.00%) respondent, 25 years old with 4 (2.67%), and 24 years old with 9 (6.00%) respondents. 23 years old, 22 years old, and 20 years old had 18 (12.00%), 32 (21.33%), and 33 (22.00%) respondents, respectively. The age group with the highest number of respondents is 21 years old, with 50 (33.33%) respondents. The mean for the age group is 21.66, while the standard deviation is 1.48.

4.1.3 Race of Respondents

Table 4.1.3: *Descriptive Table for Respondents' Race*

Race	n	%
Malay	69	46.00
Chinese	17	11.33
Indian	8	5.33
Bumiputera Sarawak	42	28.00
Bumiputera Sabah	14	9.33
Total	150	100

Note. The actual total percentage is 99.99%, but for simplicity, percentage is rounded to one decimal and adjusted to 100%.

Table 4.1.3 shows the demographic table for race. The majority of races are Malay with 69 (46.00%) respondents, followed by Bumiputera Sarawak with 42 (28.00%), then Chinese with 17 (11.33%), and Bumiputera Sabah with 14 (9.33%) respondents. The least number of respondents are Indians, with 8 (5.33%) respondents.

4.1.4 Year of Study of Respondents

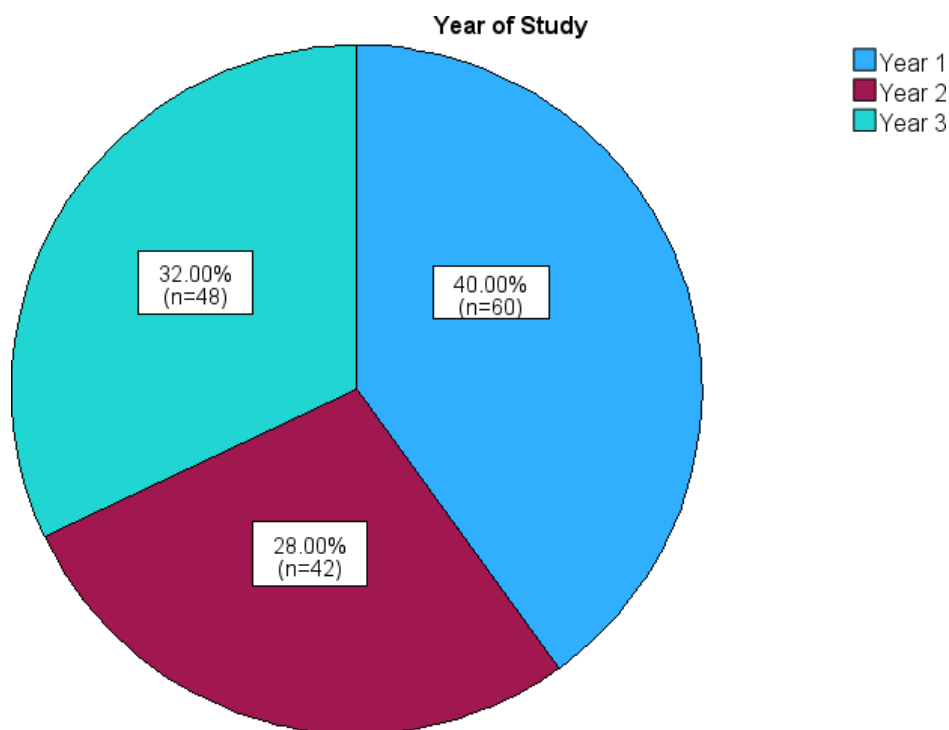


Figure 4.1.4 Pie Chart of Respondents' Year of Study

Next, the data on the respondent's year of study is collected. Figure 4.1.4 illustrates Year 1 students with the highest number of respondents, with 60 (40.00%) respondents. Year 3 and Year 2 students had a total of 48 (32.00%) and 42 (28.00%) respondents, respectively.

4.1.5 Cumulative Grade Point Average of Respondents

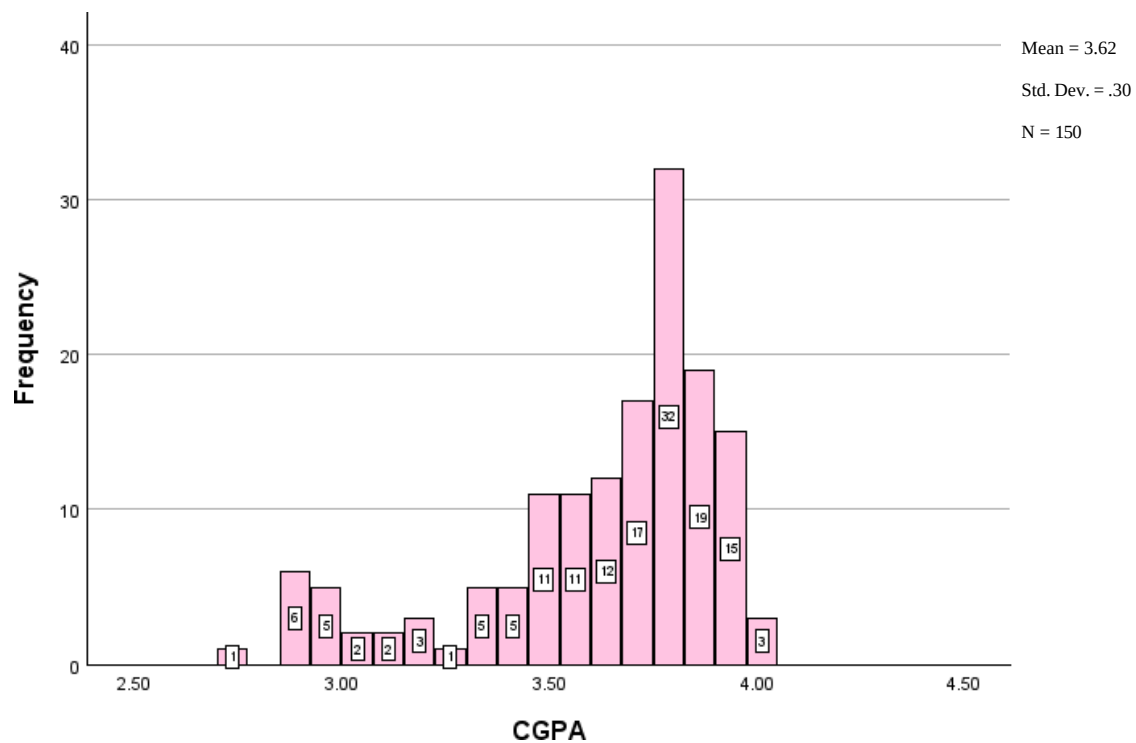


Figure 4.1.5 Histogram of Respondents' Cumulative Grade Point Average

Lastly, the cumulative grade point average of students is collected. Figure 4.1.5 illustrates the total mean for the overall cumulative grade point average is 3.62, while the standard deviation is 0.30. Figure 4.1.5 illustrates a bimodal distribution, indicating two peaks. The first peak ranges between 2.50 and 3.00, with a maximum frequency of 6. The second peak ranges between 3.50 and 4.00, with a maximum frequency of 32. Most cumulative grade point averages fall between the range of 3.50 and 4.00. An outlier is identified at a cumulative grade point average of 2.70.

4.1.6 Normality Testing

Normality testing is conducted to decide on which statistical test will be used (Mishra et al., 2019). The Kolmogorov-Smirnov test is used when the sample size exceeds 50, as stated by Mishra et al. (2019). The null hypotheses for each variable are:

1. H₀: The data for the cumulative grade point average is normally distributed.
2. H₀: The data for metacognitive awareness is normally distributed.
3. H₀: The data for procrastination is normally distributed.

Table 4.1.6: *Normality Testing for Respondents' Cumulative Grade Point Average, Metacognitive Awareness, and Procrastination*

Variables	<i>n</i>	<i>M</i>	<i>SD</i>	Kolmogorov-Smirnov Statistic	<i>p</i>
Cumulative Grade Point Average	150	3.62	0.30	.16	<.001
Metacognitive Awareness	150	3.79	0.57	0.06	0.20
Procrastination	150	3.22	0.58	0.10	0.00

Note. Mean and standard deviation for all variables is included.

Table 4.1.6 shows the normality testing for cumulative grade point average, metacognitive awareness, and procrastination. The mean and standard deviation of all variables are also included for a more comprehensive overview of the overall data. The total mean for the overall cumulative grade point average is 3.62, with a standard deviation of 0.30. The total mean for overall metacognitive awareness is 3.79, with a standard deviation of 0.57. The total mean for overall procrastination is 3.22, with a standard deviation of 0.58.

Table 4.1.6 shows the Kolmogorov-Smirnov statistic for cumulative grade point average (0.16), metacognitive awareness (0.06), and procrastination (0.10). However, the p-value for both cumulative grade point average (<0.001) and procrastination (0.00) is statistically significant. This means that both null hypotheses are rejected, and the data are concluded to be not normally distributed. However, the p-value for metacognitive awareness is 0.20, which is not statistically significant, indicating that the data is normally distributed. Due to the mixed nature of the data, where two variables are not normally distributed while one is, the researcher has chosen to use Spearman's rank-order correlation coefficient. Therefore, this statistical test is most appropriate because it is a non-parametric test that is suitable for continuous data that is not normally distributed, is also applicable for non-continuous data, and is less sensitive to outliers (Schober, 2018).

4.2 Inferential Data (Main Findings)

4.2.1 Metacognitive Awareness and Cumulative Grade Point Average

Table 4.2.1(a): *Spearman's Rank-Order Correlation Coefficient for Metacognitive Awareness and Cumulative Grade Point Average*

Variables	<i>n</i>	M	SD	<i>r</i>	<i>p</i>
Cumulative Grade Point Average	150	3.62	0.30	0.06	0.49
Metacognitive Awareness	150	3.79	0.57	0.06	0.49

Table 4.2.1(a) shows the correlation between cumulative grade point average and metacognitive awareness. The result shows that the respondents have an above-average mean for both variables. Table 4 shows $r = 0.06$, $p = 0.49$, and $n = 150$. The p value is 0.49, which is

greater than 0.05. With this p-value, the null hypothesis is failed to be rejected. As a result, the finding shows that there is no significant relationship between cumulative grade point average and metacognitive awareness.

4.2.1.1 Discussion

This finding is supported by a recent study by Wulandari et al. (2022), who employed a similar methodology, had a similar sample size, and were from the same region. As there are many similarities in different aspects of both of our research, it can be said that it further enhances the reliability and validity of our findings.

Norman's (2020) perspective article can be used to justify these findings. The author explains how metacognition can disrupt an individual's task performance (Norman, 2020). One point that the author mentions is a need for mindlessness at times (Norman, 2020). For example, in an exam where there are multiple-choice questions, there is a possibility of having an option that states "all of the above." Even though the student initially knows the answer is another option, the influence of metacognition can cause the said student to overthink the answer, causing him or her to be unsure. In the end, because the student is conflicted between the two answers, they choose "all of the above" because it is considered a safer option. This example highlights how metacognition can disrupt an individual's decision-making, causing them to be doubtful and choose a safer option rather than going with the answer they intuitively knew from the start. In a situation where it is normal for students to feel nervous when taking an examination, it is possible that respondents have experienced a similar situation. In this situation, a student who has a high metacognitive awareness level's performance may be

disrupted. Eventually, the students will perform similarly, regardless of their metacognition level.

There are also some studies that find contradictory findings, such as Ward & Butler (2019), who found a significant relationship between metacognitive awareness and academic achievement. This different finding could be explained by understanding that Wulandari et al. (2022) study and the current study were conducted in the context of Southeast Asia, while Ward & Butler's (2019) study was conducted in the Western region. This could imply that cultural differences may play a role in shaping our metacognitive awareness. This could be explained by understanding that research has found that metacognition differs in different cultures. In Plas et al. (2022) study, they found that their Western and non-Western samples differ in one of their tasks related to metacognition. Specifically, these different samples respond differently to their decision-making tasks as a result of their metacognitive evaluation. This further highlights the difference between metacognitive influences in Western society as compared to non-Western society, which is reflected in both the current findings and Ward & Butler's (2019) findings.

To expand on this concept further, a theory proposed by Heyes and Frith (2014) explains how a country's cultural dimension, individualism or collectivism, affects the way they think. Collectivist society tends to understand what others know before understanding the idea of differing opinions, but individualist society understands the opposite (Heyes & Frith, 2014). This relates to metacognition because it reflects how culture affects metacognitive aspects of a student, such as decision-making and problem solving. As an example, in a collectivist society such as Malaysia and Indonesia (in reference to the current study and Wulandari's study),

collaborative learning is highly anticipated. An individualist society (in reference to Ward & Butler's study), on the other hand, encourages more self-reflection and personal insight. These different approaches to metacognitive strategies will then eventually be reflected in our respective findings, further explaining the contradicting results.

Metacognitive awareness is a highly valued topic when it comes to the education field. By recognising both the limitations and cultural influences of metacognition, researchers and educators alike can have a better understanding of the complexities of academic achievement, especially in the context of university students.

4.2.2 Procrastination and Cumulative Grade Point Average

Table 4.2.2(a): *Spearman's Rank-Order Correlation Coefficient for Procrastination and Cumulative Grade Point Average*

	<i>n</i>	<i>M</i>	<i>SD</i>	<i>r</i>	<i>p</i>
Cumulative Grade Point Average	150	3.62	0.30	-0.02	0.85
Procrastination	150	3.22	0.58	-0.02	0.85

Table 4.2.2(a) shows the correlation between cumulative grade point average and procrastination. The mean for procrastination is slightly above average. This means that the respondent's procrastination tendency is inclined towards procrastination but not on the extreme side. Table 5 shows $r = -0.02$, $p = 0.85$, and $n = 150$. The p value is 0.85, which is greater than 0.05. With this p -value, the null hypothesis is failed to be rejected. The finding

shows that there is no significant relationship between cumulative grade point average and procrastination.

4.2.2.1 Discussion

The result found that there is no significant relationship between procrastination and academic achievement among undergraduate psychology students at UNIMAS. However, as expected, procrastination has a negative relationship with students' academic achievement.

This finding that there is no significant relationship between procrastination and academic achievement is supported by several studies, including McFadden (1999), Gungor (2020), and Kaur (2023). Although there are considerably large year-long gaps between some of these studies, the findings manage to still be consistent with the current study. This shows that procrastination is not necessarily a problem for some students, as they can still achieve a desirable result regardless of their procrastination behaviour.

There is a possible explanation for these findings. Nocera et al. (2023) explained that there are two types of procrastinators: high-procrastinators (productivity increases as deadlines close) and low-procrastinators (consistent productivity). These two procrastinators are differentiated by several aspects, including strategy, spurts of productivity, and coping styles. Based on the current findings, it is suggested that the respondents are influenced by an underlying mechanism within procrastination, such as their personal strategy or coping styles, to achieve their academic result.

To further explain the justification for the current findings, the article by Seo (2012) will be used. The author found that between active procrastinators and passive procrastinators, active procrastinators did well in terms of their academic achievement. Seo (2012) further justifies these findings by stating that being an active procrastinator has a bigger influence on their academic result, regardless of the amount of time the procrastinators had to study for their exam. Seo (2012) further explains how cramming can be an effective study method for procrastinators. In the context of the current findings, it is likely that the respondents are also active procrastinators.

Additionally, the cumulative grade point average is inclusive of both assignments and exams. Assignments play a big role in students cumulative grade point averages in the context of the researcher's university. Some subjects' assignments can take up to 70% of their grades, or it's even possible for these assignments to take 100% of their grades. Students are given a rubric to clarify what is expected and what criteria will be evaluated on the assignment. This gives students a clear guideline to follow, which can increase their grades. To add to that, while working on an assignment, students are generally allowed to consult with their lecturers. Upon receiving feedback from their respective lecturers, they can further improve their work. Therefore, even if they improve their weaknesses in their work close to the deadline, they already know what specific aspects of their work to improve. In the end, as long as they listen well to the advice given by their lecturer and submit their work on time, their academic achievement is not compromised.

Procrastination is still a prevalent problem for university students. Despite that, they are still able to work their way around this behaviour to achieve their current result. This goes to show that procrastination and academic achievement are complex relationships that need more study to be understood.

4.3 Summary

150 valid samples are analysed. In the demographic section, these are the highest respondents according to each category: gender-female; age-21 years old; race-Malay; year of study-1st year students and cumulative grade point average-around the range of 3.70. Both null hypotheses relating to finding no significant relationship between cumulative grade point average and metacognitive awareness/procrastination failed to be rejected.

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CHAPTER FIVE

LIMITATION, IMPLICATION, RECOMMENDATION AND CONCLUSION

5.0 Introduction

This section discusses the limitations, implications, recommendations and conclusion of the study.

5.1 Limitations of Study

First and foremost, this study uses a quantitative method and questionnaire to answer the research question. Although this methodology is able to receive large amounts of data within the given timeframe, it does not delve deeper into the relationship between metacognitive awareness, procrastination, and academic achievement. Secondly, this study cannot be generalised as it is a convenience sample. The samples obtained are only from first- to third-year psychology students who were available on the UNIMAS campus at the time that the questionnaire was distributed. Thirdly, the questionnaire is what is considered a self-report questionnaire. Respondents may be influenced by multiple factors, such as personal problems or environmental problems, that may lead to inaccuracies in their responses. Fourth, this is a correlational analysis where, although it can establish a relationship, it cannot establish a cause-and-effect relationship.

5.2 Implications

The results show that there is no significant difference between metacognitive awareness, procrastination, and academic achievement. This can have both practical and theoretical implications.

Two instruments that originated in Western countries are used in this research to assess student's metacognitive awareness and procrastination tendency. The use of instruments that are culturally adaptable is highly important to ensure that the concepts remain the same regardless of the context that may affect the findings, such as language and time (Gjersing et al., 2010). Gjersing et al. (2010) state that additionally, the findings would then be fair enough to be able to be compared across cultures. To ensure that this can be achieved, test developers developing a test should conduct a cross-cultural study. This way, the data collected from different cultures can be used to conduct reliability and validity testing. Having an instrument that is culturally adaptable can be revolutionary to both metacognition and the educational field. It serves as a meaningful insight, and since some issues, such as procrastination, are global problems, a global solution or intervention can be implemented.

The current findings challenge Flavell's (1979) model of metacognition. The model does not address the transferability of metacognitive skills. For example, a student demonstrating good language comprehension skills does not necessarily mean the skills are also applicable to mathematical concepts. It is important to address these limitations, as in the context of the current study, university students deal with multiple subjects in one semester. The subjects cover different areas, such as statistics, language, and science. The wide variety of skills needed

means that students need to adapt according to the requirements of different subjects, which influences their academic achievement. Therefore, the limitations of Flavell's model in terms of metacognitive skill transferability should be further analysed.

Next, the current findings support the temporal motivation theory introduced by Steel and Konig (2006). To explain it briefly, the theory discusses how time plays a crucial factor in motivating an individual's behavior. The current findings found that students who procrastinate more and students who procrastinate less do not differ much in terms of their academic achievement. In the context of this study, the closer the deadlines are approaching, the higher the expectancy and value, which influence students' motivation. This spurt of motivation affects their productivity, which could explain why there is not much difference in academic achievement regardless of the student's procrastination behaviour. The current findings further suggest that the urgency of a deadline allows students to perform effectively due to what is at stake (their grades and meeting the deadline). Additionally, it shows how students are adaptable according to the situation at hand. In this case, how they go about their academic matter to achieve a desirable result. Therefore, this theory highlights its relevancy and importance in the context of university students' academic behaviour and its outcome.

Intervention programmes should be personalised instead of having one single plan. As found in the research, academic achievement is not determined by the metacognitive awareness level or the procrastination frequency. Due to this, parties involved in intervention programmes, such as educators or policymakers, should recognise the specific needs of the identified student. This means that other factors in a student's life that have affected their metacognition level or

procrastination level should be taken into consideration when coming up with an intervention. This factor can range from limited time due to working while studying, clinical problems or even family obligations. Therefore, it is also important that the intervention support the student's wellbeing, be it physically or mentally. Eventually, by having this multifaceted approach to intervention, it can improve students' academic achievement.

5.3 Recommendations

Several recommendations are proposed for future studies. Firstly, it is recommended for future researchers to conduct a mixed-methods study. In addition to the Metacognitive Awareness Inventory and the Procrastination Assessment Scale-Students, researchers should employ a qualitative method in their study. It would be insightful to understand how exactly students' metacognitive awareness and procrastination influence their academic achievement. By conducting a personalised interview with students who are on a different spectrum for each variable, such as high and low cumulative grade point average, high and low metacognitive awareness level, and high and low procrastination frequency, it provides more comprehensive insights into the topics. Additionally, the interaction or mediator effects of the variables can be observed through these interviews. Besides that, it would be interesting to see the strategies and coping mechanisms of a student who has a low metacognitive awareness level but a high procrastination tendency yet still manages to achieve a good academic result.

Secondly, an experimental research design should be conducted. The chosen sample for the study would have to go through an intervention programme for researchers to evaluate the effectiveness. It addresses the limitations of the current research, which could not establish a

cause-and-effect relationship. Once the experiment has been conducted, there will be stronger empirical evidence on how metacognitive awareness and procrastination can influence a student's academic achievement.

Lastly, a larger sample size should be employed by future researchers, possibly a diverse sample size. This allows for the generalizability of the findings. By having samples of different backgrounds, such as culture, academic disciplines, private or public institutions, and socioeconomic status, it is more representative of the university student's population. This variation will help validate the findings, which are inclusive of the target population. By using this methodology, it contributes to a better understanding of how academic achievement is varied among students.

By employing the three recommendations, the findings can inform educational policies and intervention programmes more seriously and effectively.

5.4 Conclusion

To conclude the study, there is no significant relationship between metacognitive awareness, procrastination and academic achievement among undergraduate Psychology students in UNIMAS. The current finding implies both practical and theoretical implications. Lastly, as the research had several limitations, a few recommendations for future research are presented.

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APPENDIX A

RAW SPSS OUTPUTS

Reliability Statistics (Metacognitive Awareness Inventory)

Cronbach's Alpha	N of Items
.92	19

Item-Total Statistics: Metacognitive Awareness Inventory

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1. I think about what I really need to learn before I begin a task.	71.3	112.27	.78	.91
2. I set specific goals before I begin a task.	71.0	129.60	.00	.93
3. I know what kind of information is most important to learn.	71.0	121.60	.60	.91
4. I know what the teacher expects me to learn.	70.7	124.67	.47	.92
5. I have control over how well I learn.	71.7	107.07	.87	.90
6. I periodically review to help me understand important relationships.	71.5	103.90	.88	.90
7. I summarize what I've learned after I finish.	71.7	107.07	.87	.90
8. I can motivate myself to learn when I need to.	71.3	109.87	.90	.90

9. I am aware of what strategies I use when I study.	71.2	126.57	.09	.93
10. I am a good judge of how well I understand something.	71.2	118.97	.49	.91
11. I find myself using helpful learning strategies automatically.	71.7	107.47	.85	.90
12. I know when each strategy I use will be most effective.	71.5	121.50	.71	.91
13. I try to translate new information into my own words.	70.5	123.10	.58	.91
14. I change strategies when I fail to understand.	70.7	124.27	.51	.92
15. I use the organizational structure of the text to help me learn.	70.7	113.07	.62	.91
16. I ask myself if what I'm reading is related to what I already know.	70.3	124.67	.47	.92
17. I reevaluate my assumptions when I get confused.	70.33	124.667	.474	.916
18. I ask myself if I learned as much as I could have once I finish a task.	71.67	102.667	.934	.901
19. I stop and go back over new information that is not clear.	70.17	130.967	-.078	.922

**Reliability Statistics
(Metacognitive
Awareness Inventory)**

Cronbach's Alpha	N of Items
.72	12

Item-Total Statistics: Procrastination Assessment Scale-Students

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
1. WRITING A TERM PAPER: To what degree do you procrastinate on this task?"	33.17	34.967	.340	.711
2. WRITING A TERM PAPER: To what degree is procrastination on this task a problem for you?	33.33	32.667	.443	.696
6. STUDYING FOR EXAMS: Do you want to decrease your tendency to procrastinate on this task?	35.17	34.567	.404	.706
7. KEEPING UP WITH WEEKLY READING ASSIGNMENTS (reading study material before class): To what degree do you procrastinate on this task?	34.83	35.767	.314	.716

8. KEEPING UP WITH WEEKLY READING ASSIGNMENTS (reading study material before class): To what degree is procrastination on this task a problem for you?	34.67	32.667	.609	.687
9. KEEPING UP WITH WEEKLY READING ASSIGNMENTS (reading study material before class): Do you want to decrease your tendency to procrastinate on this task?	35.17	37.367	-.030	.736
10. ACADEMIC ADMINISTRATIVE TASKS: FILLING OUT FORMS, REGISTERING FOR CLASSES, GETTING ID CARD: To what degree do you procrastinate on this task?	34.17	28.967	.445	.691
11. ACADEMIC ADMINISTRATIVE TASKS: FILLING OUT FORMS, REGISTERING FOR CLASSES, GETTING ID CARD: To what degree is procrastination on this task a problem for you?	35.00	32.000	.233	.729

12. ACADEMIC ADMINISTRATIVE TASKS: FILLING OUT FORMS, REGISTERING FOR CLASSES, GETTING ID CARD: Do you want to decrease your tendency to procrastinate on this task?	35.17	39.367	-.248	.766
13. UNIVERSITY ACTIVITIES IN GENERAL: To what degree do you procrastinate on this task?"	34.33	26.267	.666	.648
14. UNIVERSITY ACTIVITIES IN GENERAL: To what degree is procrastination on this task a problem for you?	34.17	28.167	.506	.680
15. UNIVERSITY ACTIVITIES IN GENERAL: Do you want to decrease your tendency to procrastinate on this task?	35.17	24.567	.705	.636

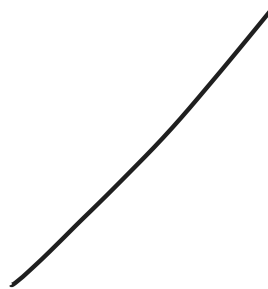
Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	119	79.3	79.3	79.3
	Male	31	20.7	20.7	100.0
	Total	150	100.0	100.0	

Statistics

Age

N	Valid	150
	Missing	0
Mean		21.66
Mode		21.00
Std. Deviation		1.48

Age					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20.00	33	22.00	22.00	22.00
	21.00	50	33.33	33.33	55.33
	22.00	32	21.33	21.33	76.67
	23.00	18	12.00	12.00	88.67
	24.00	9	6.00	6.00	94.67
	25.00	4	2.67	2.67	97.33
	26.00	3	2.00	2.00	99.33
	27.00	1	.67	.67	100.00
	Total	150	100.0	100.0	



Race

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Bumiputera Sabah	14	9.33	9.33	9.33
	Bumiputera Sarawak	42	28.00	28.00	37.33
	Chinese	17	11.33	11.33	48.67
	Indian	8	5.33	5.33	54.00
	Malay	69	46.00	46.00	100.00
	Total	150	100.0	100.0	

Year of Study

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Year 1	60	40.00	40.00	40.00
	Year 2	42	28.00	28.00	68.00
	Year 3	48	32.00	32.00	100.00
	Total	150	100.00	100.00	

Statistics

CGPA

N	Valid	150
	Missing	0
Mean		3.62
Mode		3.70
Std. Deviation		.30

Cumulative Grade Point Average

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2.70	1	.7	.7	.7
	2.86	2	1.3	1.3	2.0
	2.89	1	.7	.7	2.7
	2.90	2	1.3	1.3	4.0
	2.92	1	.7	.7	4.7
	2.93	1	.7	.7	5.3
	2.94	1	.7	.7	6.0
	2.95	2	1.3	1.3	7.3
	2.98	1	.7	.7	8.0
	3.04	1	.7	.7	8.7
	3.05	1	.7	.7	9.3
	3.09	1	.7	.7	10.0
	3.14	1	.7	.7	10.7
	3.19	2	1.3	1.3	12.0
	3.19	1	.7	.7	12.7
	3.28	1	.7	.7	13.3
	3.30	1	.7	.7	14.0
	3.34	1	.7	.7	14.7
	3.35	3	2.0	2.0	16.7
	3.39	2	1.3	1.3	18.0
	3.40	1	.7	.7	18.7
	3.43	2	1.3	1.3	20.0
	3.46	1	.7	.7	20.7
	3.47	2	1.3	1.3	22.0
	3.48	3	2.0	2.0	24.0
	3.49	1	.7	.7	24.7
	3.50	2	1.3	1.3	26.0
	3.51	2	1.3	1.3	27.3
	3.54	1	.7	.7	28.0
	3.55	1	.7	.7	28.7
	3.56	4	2.7	2.7	31.3
	3.58	5	3.3	3.3	34.7
	3.60	3	2.0	2.0	36.7
	3.61	3	2.0	2.0	38.7
	3.62	1	.7	.7	39.3
	3.64	1	.7	.7	40.0

3.66	1	.7	.7	40.7
3.67	3	2.0	2.0	42.7
3.68	1	.7	.7	43.3
3.69	1	.7	.7	44.0
3.70	6	4.0	4.0	48.0
3.71	1	.7	.7	48.7
3.72	3	2.0	2.0	50.7
3.73	1	.7	.7	51.3
3.74	4	2.7	2.7	54.0
3.75	4	2.7	2.7	56.7
3.76	5	3.3	3.3	60.0
3.77	4	2.7	2.7	62.7
3.78	4	2.7	2.7	65.3
3.79	3	2.0	2.0	67.3
3.80	4	2.7	2.7	70.0
3.81	4	2.7	2.7	72.7
3.82	4	2.7	2.7	75.3
3.83	1	.7	.7	76.0
3.84	4	2.7	2.7	78.7
3.85	2	1.3	1.3	80.0
3.86	3	2.0	2.0	82.0
3.87	3	2.0	2.0	84.0
3.88	1	.7	.7	84.7
3.89	5	3.3	3.3	88.0
3.90	5	3.3	3.3	91.3
3.91	1	.7	.7	92.0
3.92	1	.7	.7	92.7
3.94	3	2.0	2.0	94.7
3.95	1	.7	.7	95.3
3.96	4	2.7	2.7	98.0
3.98	1	.7	.7	98.7
4.00	2	1.3	1.3	100.0
Total	150	100.0	100.0	

Statistics

		Metacognitive Awareness	Procrastination
N	Valid	150	150
	Missing	0	0
Mean		3.79	3.22
Mode		3.58 ^a	3.25
Std. Deviation		.57	.58

a. Multiple modes exist. The smallest value is shown

Tests of Normality

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
CGPA	.16	150	<.001	.87	150	<.001
Metacognitive Awareness	.06	150	.20*	.99	150	.13
Procrastination	.10	150	.00	.99	150	.12

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Correlations

			CGPA	Metacognitive Awareness	Procrastination
Spearman's rho	CGPA	Correlation Coefficient	1.000	.06	-.02
		Sig. (2-tailed)	.	.49	.85
		N	150	150	150
	Metacognitive Awareness	Correlation Coefficient	.06	1.00	-.12
		Sig. (2-tailed)	.49	.	.15
		N	150	150	150
	Procrastination	Correlation Coefficient	-.02	-.12	1.00
		Sig. (2-tailed)	.85	.15	.
		N	150	150	150

APPENDIX B

MATERIALS/INSTRUMENT

THE ROLE OF METACOGNITIVE AWARENESS AND PROCRASTINATION ON ACADEMIC ACHIEVEMENT AMONG UNDERGRADUATE PSYCHOLOGY STUDENTS IN UNIMAS

INFORMED CONSENT FORM

Please read the informed consent carefully before submitting.

Researcher: Stephanie Lembai Anak Utap (81283) , 3rd Year, Psychology Programme.

Purpose of Study: This study is conducted to identify the relationship between metacognitive awareness and procrastination on academic achievement among undergraduate psychology students in UNIMAS.

Procedure: Participant is required to **answer all sections** (section A, section B and section C) **and questions**. This questionnaire would take up to no more than 20 minutes. Section A consists of the demography of participant. Section B consists of answering the Procrastination Assessment Scale for Students which is adapted from Solomon and Rothblum (1994). Section C consists of answering the Metacognitive Awareness Inventory which is adopted from Harrison and Vallin (2017); the original Metacognitive Awareness Inventory is developed by Schraw and Dennison (1994). Both section B and section C is in the form of 5 likert scale.

Potential Risk: Participants may feel discomfort answering the questionnaire regarding their personal behavior.

Inclusion criteria:

- 1) Currently an undergraduate student studying psychology at UNIMAS.
- 2) Can read and understand English.
- 3) Have at least one semester worth of CGPA.
- 4) First, second, or third-year psychology students.

Confidentiality: All data collected are confidential and is used for the purpose of the research and academic matters only. Publications of data may also occur, but without personal identification to the participant to protect the privacy of the participant.

Participant Rights: Participations are entirely voluntarily. Participants have the right to withdraw at any moment of the study without facing any consequences.

Contact Information of the Researcher: 014-6952108 ; 81283@siswa.unimas.my. Should there be any questions regarding the questionnaire, please contact the researcher through any of the available methods.

Consent Statement: By submitting this form, I understand, have read thoroughly the details of this study including the researcher in charge, purpose of the study, potential risk, confidentiality, participants rights and contact information of the researcher and has agreed to participate in this study.

Section A: Demography

Age

Gender (Circle ONE only)

Male	Female
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Race (Tick $\checkmark$ ONE only or if is categorized under 'Others', please state ONE)

Malay	
Chinese	
Indian	
Bumiputera Sarawak	
Bumiputera Sabah	
Others (Please state)	

Year of Study (Tick $\checkmark$ One)

Year 1	
Year 2	
Year 3	

CGPA; as of Semester 2, 2023/2024. State your CGPA in 2 decimal point. Eg 3.67

Section B: Procrastination Assessment Scale for Students

Instruction: For each of the following activities, please rate the degree to which you delay or procrastinate. B.i) Rate each item on the “1” to “5” scale according to how often you wait until the last minute to do the activity. B.ii) Indicate on the “1” to “5” scale the degree to which you feel procrastination on that task is a problem. B.iii) Indicate on the “1” to “5” scale the degree to which you would like to decrease your tendency to procrastinate on each task.

For this section, please ✓ in the box provided.

b.i) The scale goes as follows: 1-Never, 2-Rarely, 3-Sometimes, 4-Often, 5-Always.

	1	2	3	4	5
To what degree do you procrastinate on this task?					
1. Writing a term paper.					
2. Keeping up with weekly reading assignments (reading study material before class).					
3. Academic administrative tasks: Filling out forms, registering for classes, getting ID card.					
4. University activities in general.					

b.ii) The scale goes as follows: 1- Not at all a problem, 2-Almost never a problem, 3-Sometimes a problem, 4-Nearly always a problem, 5-Always a problem.

	1	2	3	4	5
To what degree is procrastination on this task a problem for you?					
5. Writing a term paper.					
6. Keeping up with weekly reading assignments (reading study material before class).					
7. Academic administrative tasks: Filling out forms, registering for classes, getting ID card.					
8. University activities in general.					

b.iii) The scale goes as follows: 1- Not at all, 2-Slightly want to, 3-Moderately want to, 4-Very much want to, 5-Extremely want to.

	1	2	3	4	5
Do you want to decrease your tendency to procrastinate on this task?					
9. Studying for exams					
10. Keeping up with weekly reading assignments (reading study material before class).					
11. Academic administrative tasks: Filling out forms, registering for classes, getting ID card.					
12. University activities in general.					

Section C: METACOGNITIVE AWARENESS INVENTORY

Instruction: In a scale of 1 to 5, please rate how typical it is for you to apply these in your daily life when learning academic material.

For this section, please ✓ in the box provided.

The scale goes as follows: 1 = Not at all typical of me, 2 = Not very typical of me, 3 = Somewhat typical of me, 4 = Fairly typical of me, 5 = Very typical of me

	1	2	3	4	5
1. I think about what I really need to learn before I begin a task.					
2. I set specific goals before I begin a task.					
3. I know what kind of information is most important to learn.					
4. I know what the teacher expects me to learn.					
5. I have control over how well I learn.					
6. I periodically review to help me understand important relationships.					
7. I summarize what I've learned after I finish.					
8. I can motivate myself to learn when I need to.					
9. I am aware of what strategies I use when I study.					
10. I am a good judge of how well I understand something.					
11. I find myself using helpful learning strategies automatically.					
12. I know when each strategy I use will be most effective.					
13. I try to translate new information into my own words.					
14. I change strategies when I fail to understand.					
15. I use the organizational structure of the text to help me learn.					
16. I ask myself if what I'm reading is related to what I already know.					
17. I reevaluate my assumptions when I get confused.					
18. I ask myself if I learned as much as I could have once I finish a task.					
19. I stop and go back over new information that is not clear.					