ACADEMIC HARDINESS AMONG MALAYSIANS UNIVERSITY STUDENTS: ACADEMIC HARDINESS, ACADEMIC LOCUS OF CONTROL, TOLERANCE OF AMBIGUITY, STUDENTS' ENGAGEMENT AND AUTOMATIC NEGATIVE THOUGHTS.

DEXTER TAN CHI ENG

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Academic Hardiness among Malaysian University Students: Academic Hardiness, Academic Locus of Control, Tolerance of Ambiguity, Student's Engagement and Automatic Negative Thoughts.

Dexter Tan Chi Eng

Universiti Tunku Abdul Rahman

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APPROVAL FORM

This research paper attached hereto, entitled “Academic Hardiness among Malaysians University Students: Academic Hardiness, Academic Locus of Control, Tolerance of Ambiguity, Students’ Engagement and Automatic Negative Thoughts .” prepared and submitted Dexter Tan Chi Eng in partial fulfilment of the requirements for the Bachelor of Social Science (Hons) Guidance and Counselling is hereby accepted.

_____ Date: _____

Supervisor
(Mr. Ho Khee Hoong)

Abstract

Academic hardiness refers to personality characteristics that help an individual to deal with academic stress and academic challenges which may lead to drop out. This study aims to investigate the relationships between academic locus of control (ALOC), tolerance of ambiguity, students' engagement, automatic negative thought (ANT), and academic hardiness among university students in Malaysia. A cross-sectional study was conducted among 94 participants and they were recruited by applying the purposive sampling method. The participants were Malaysian university students aged between 18 to 26 years (M = 21.69 years; SD = 1.90 years). Female participants (n = 58, 55.24%) were more than male participants (n = 47, 44.76%). The instruments used were Academic Hardiness Scale , Academic Locus of Control Scale , Tolerance of Ambiguity Scale , University Students' Engagement Inventory , and Automatic Negative Thoughts Scale. Finding revealed that ALOC was positively correlated with control, commitment, and challenge components of academic hardiness. Tolerance of ambiguity was found no significant relationship with control, commitment, and challenge components of academic hardiness. University students' engagement was found positively correlated with control, commitment, and challenge components of academic hardiness. ANT was found negatively correlated with control and challenge components but no significant relationship commitment components of academic hardiness. Academic hardiness was significantly predicted by ALOC (positively), university students' engagement (positively), and ANT (negatively), while insignificant predicted by tolerance of ambiguity. The findings of this study would provide a practical insight for university counsellors to deal with Malaysian university students who were at high risk of dropping out by increasing their academic hardiness.

Keywords: Academic hardiness, Academic locus of control, tolerance of ambiguity, Students' engagement, and automatic negative thoughts

DECLARATION

I declare that the material contained in this paper is the end result of my own work and that due acknowledgement has been given in the bibliography and references to ALL sources be they printed, electronic or personal.

Name: DEXTER TAN CHI ENG

Student ID: 18AAB06778

Signed: _____

Date: 16TH April 2021

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List of Abbreviations

AHS	Academic Hardiness
ALOC	Academic Locus of Control
ANT	Automatic Negative Thoughts
MLR	Multiple Linear Regression
PPMC	Pearson's Product-Moment Correlation
USEI	University Students' Engagement Inventory

Chapter 1

Introduction

Background of Study

Students' dropout from educational institutions remains a central issue that is faced by educational institutions across the world (Tentsho et al., 2019; Tinto, 2006). According to Edward and Pichyada (2019), there are critical consequences of dropping out of university which directly affected individuals, institutions and society which included wasted time, the possibility of psychological trauma, negative labor market outcomes, developing a negative image of the institutions and affecting its enrollment rate directly.

There are varying degrees of dropout rate from around the world. There has been a rise and fall of the dropout rate in Malaysia. The latest dropout rate of Malaysia school dropout rate is 29% in 2018 by the education ministry of Malaysia which is relatively high compared to other countries (Amran, 2018). The dropout rate overall five years period in Thailand is 23.95% (Tentsho et al., 2019). A report from the Ministry of Human Resource Development (Delhi, 2020) revealed that the higher education institutions in India have 6.198% of dropout rate overall over 5 years. Furthermore, the Ministry of Education in Taiwan reported that Taiwan Universities reached a record high dropout rate which is 13.38% in the year 2019 (Rachel et al., 2020). The National Center for Education Statistics reported that the United State has an overall 40% dropout rate among university students and 30% are from the first-year universities students (NCES, 2014).

Unfortunately, Malaysia has no exception from the issues of dropout. The overall dropout rate in Malaysia is between 10% to 14% which calls the attention for dropout issues (Beh, 2016). Although, various factors potentially contribute to dropout issues for instance negative life events (Samuel & Burger, 2020) and resilience (Sorkkila et al., 2019). However, academic hardiness is one of the key factors that explain this undesirable outcome of dropping out (Maddi et al, 2002). Apart from that, student counsellors are part of the expected provision by a university to provide counselling services to high risk of dropping out students (Pearson, 2012). A study conducted by Rickinson and Rutherford (1995) also mentioned that most university students tend to consult personal tutors for advice and minority university students referred to counselling services before withdrawing from the university. In short, student counsellors play a significant role in student retention.

Hardiness refers to personality characteristics or attitudes that help an individual in managing stressful and adverse circumstances by turning it from a threat or debilitating experience into growth opportunities through the courage and motivation that provide by hardiness (Maddi, 2002; Kobasa, 1979). Hardiness composes of three intercorrelated components which include control, commitment and challenge (Kobasa, 1979). Although, there are several studies (Maddi, 2002; Kobasa, 1979) revealed that these three components are intercorrelated however they are not identical.

However, academic hardiness provided a framework for explaining why some students are willing to accept and pursue academic challenges whereas others avoid academic challenges even considering dropping out. According to Benishek and Lopez (2001), the three components of academic hardiness are defined by psychological hardiness and academic motivation in the specific nature of the academic context. The commitment was defined as a willingness to give

effort and engage in personal sacrifices to achieve academic excellence, demands of individual courses, instructors or personal interests even if the circumstances are stressful. Challenge was defined as students' view difficult academic coursework and experiences as normal and important for personal development and seek out difficult academic challenges actively. Control was defined as students' beliefs that they can determine their educational outcomes and achieve their desired outcomes through the personal effort with effective emotional self-regulation as facing academic disappointments and academic stresses.

Rotter's locus of control is one of the concepts that theoretically consistent with the control of the hardiness construct (Rush, 1995). Locus of control is conceptualized as the degree to which an individual builds their belief and expectancy that their behaviour and outcome are associated with either internal or external reinforcements (Rotter, 1966). Furthermore, locus of control composed of internal locus of control and external locus of control. Internal locus of control refers as an individual believes he can determine the outcome by their factor but not an external factor for instance environment and incident (Galvin et al., 2018). In contrast, external locus of control refers to an individual believing that their outcomes are determined by the environment but not by personal factors. Trice (1985) has defined academic locus of control as a belief of the learners that academic success and adjustment are directly impact by their behaviors. It indicates students' belief and expectancy of their academic success and performance are determined by either individual factors or environmental factors.

Tolerance of ambiguity was revealed as a variable that connected to challenge of the hardiness construct (Rezae et al., 2009; Galazhinskiy & Krasnoryadtseva, 2013; Vindeker et al., 2016; Ayala & Gracia, 2017; Kobasa, 1982). Budner (1962) defined tolerance of ambiguity as

Ambiguous situations are perceived as desirable and comfortable. According to Furnham and Marks (2013), individuals who have a low tolerance for ambiguity tend to perceive uncertainty and ambiguity situations as threats which cause reactions of stress, delay, denial, suppression and avoidance. Furthermore, students who have a low tolerance for ambiguity indicates lower affinity to challenge which refers to a student tends to avoid difficult academic coursework or academic challenge and view them as threatening (Benishek & Lopez, 2001; Rush, 1995). It might be due to a student's openness toward academic challenge is directly proportional to tolerance for ambiguity (Bardi et al., 2009). In contrast, students with a high tolerance for ambiguity have high openness toward academic challenges that are beyond their limit.

The last of the closely related variable to the commitment of academic hardiness construct is student's engagement (Benishek & Lopez, 2001). Student's engagement broadly defined by Nystrand and Gamoran (1992) as the willingness of a student to involve themselves in school activities. However, student's engagement is further expanded and conceptualized as a three-factor construct which involves cognitive, behavioural and emotional dimensions. These three dimensions reflect student's engagements in a big and detailed picture in terms of the behavioural perspective, the psychological perspective, the socio-cultural perspective and the holistic perspective. Furthermore, there are several studies showing students' engagement act as psychological protective factors that prevent school dropout and student burnout (Macoro et al., 2016).

According to Clark and Beck (2011), automatic negative thoughts are dysfunctional or distorted thinking that is supported by their intermediate and core beliefs which leads to a self-reinforcing cycle that predisposes to emotional dysregulation and maladaptive functioning. Core beliefs, intermediate beliefs, and automatic thoughts are the three-level of cognitive thought

(Clark & Beck, 2011). The most fundamental level of belief is core belief which characterized as tend to be rigid, overgeneralized and global. Attitudes and assumptions are the core elements of intermediate beliefs. The most superficial level of cognition is automatic thoughts which is comprised of sentences or images that most assessible in mind.A study has revealed that irrational beliefs are negatively associated with hardiness (Mohammd et al, 2016). It showed that automatic negative thought has the possibility of having a negative relationship with hardiness.

Academic hardiness possesses the ability to reduce the dropout rate by increasing a college student's protective factor, especially resilience to deal with psychological challenges (Hartley, 2010). A hardy individual has better hardy stress coping skills to buffer with academic stress which might result in reducing the risk of dropping out (Hasty et al., 2009). Academic hardiness possesses a huge benefit to academic settings especially university students. Thus there exists the need to discover these variables, academic locus of control, tolerance for ambiguity, students' engagement, automatic negative thought with academic hardiness among university students in Malaysia.

Problem Statement

The issue of dropout is significantly related to high academic stress as it affects students in multiple ways (Claes et al., 2009; Johnsen et al., 2009; Kamtsios & Evangelia, 2015). Unfortunately, several studies have revealed that most students experience high levels of academic stress (Choi et al., 2019; Rajoo et al., 2019). Academic stress is a widespread phenomenon among students especially University students which have been revealed to have a critical and adverse effect on all students (Abdollahi et al., 2020; Cheng et al., 2019; Hystad et

al., 2009). The higher education level causes more academic stress and the worry from consideration of career opportunities (Elias et al., 2011). Academic stress is found out that harm's academic performance (Sohail, 2013), well-being (Wunsch, 2017), depression (Putwain, 2007), physical and psychological health (Singh & Upadhyay, 2010). However, some students can cope with academic stress and achieve high academic achievement in their study life. Students with hardy attitudes appraised less harmful of their academic stressors by viewing their stressful experiences positively with challenges, rather than threatening (Kamtsios & Evangelia, 2015). Furthermore, students with high academic hardiness can manage their academic stressors by viewing their stressful experiences positively with challenging, rather than threatening (Maddi, 2006; Maddi et al., 2002). Since academic hardiness is shown to be a good protective factor for undergraduate students from the effect of university stressors. Hence, it calls attention to conduct research to identify the predicting power of specific variables on academic hardiness.

Empirical research revealed that individuals who have a low internal locus of control are prone to have low hardiness (Abdollahi et al., 2020; Vasilu, 2017; Maddi, 2002; Funk, 1992). According to Kobasa (1982), individuals who have a low internal locus of control indicate that they have low control in hardiness. Individuals not being involved in influencing the outcomes rather than sinking in passivity and powerlessness. Furthermore, students with low in control tend to not believe they hold the capacity to reach academic success through personal effort even facing academic stresses and disappointments (Benishek & Lopez, 2001). Nevertheless, these researches employed a generalized locus of control measure, rather than an academic locus of control construct. Therefore, this study aimed to examine the predictive power of academic locus of control on academic hardiness, especially in the University context.

Maddi and Harvey (2006) argued that the differences in hardiness level and stress level among people in collectivistic and individualistic cultures. Culture plays a vital role in developing hardiness (Pallabi, 2017; Maddi & Harvey, 2006). Culture hypothetically is a strong influencing factor that develops personality, values, behaviours, and morals (Pallabi, 2017). Different cultures tend to affect how people perceive stress and shape different hardy coping skills. Collectivistic culture is highly theoretically consistent with the challenge and control of the hardiness construct (Maddi & Harvey, 2006). Currently, most of the studies about hardiness are conducted in western countries which are individualistic culture (Bartone et al., 2016; Kowalski & Schemer, 2019; Vasiliki & Dennis, 2019) however it lacks studies focused on the local context. A study in Iran revealed that academic engagement is significantly correlated with academic hardiness (Zeqeibi et al., 2018). Furthermore, internal locus of control is found to be significantly related to hardiness from several studies (Abdollahi et al., 2020; Maddi, 2002; Funk, 1992). A study conducted in Russian revealed that tolerance of ambiguity has a positive relationship with hardiness (Vindeker et al., 2016). However, these results might not be applicable in Malaysia context. Therefore, it serves as a call to have a clearer understanding of the academic hardiness with other variables in the Malaysian context which is a collectivistic culture (Fauziah, 2009).

Cognitive factors, for instance, thinking styles, irrational belief, intrusive negative thought, cognitive appraisal, and coping style significantly contributed to the prediction of hardiness. Zhang and Wong (2011) reveal that norm-favouring and anarchic thinking style are negatively associated with hardiness. Besides, several studies showed a negative relationship between irrational beliefs and hardiness (Mohamad et al., 2016; Safar et al., 2019; Torfeyah et al., 2020). It is consistent with studies conducted by Warren and Hale (2020) that rational belief

has predictive effects on non-cognitive factors including traits and attributes. According to Clark and Beck (2011), automatic thought is rooted by core belief and intermediate belief. Fortunately, negative core belief can be challenged through reconstructing the person's negative thought which is on the superficial level (Clark & Beck 2011). However, the relationship between automatic negative thoughts and hardiness remain unclear due to inadequate scholarly attention has been given on it which signifies a substantial literature gap to be filled.

Significance of the Study

This research will provide theoretical support and affirmation to the theory of hardiness by Kobasa (1979). According to Pallabi (2017), the construct of hardiness is up to date due to the theory of hardiness by Kobasa (1979) was propounded 35 years ago. The objective of this research is to assess the level of hardiness among university students and examine the association between academic locus of control, student's engagement, tolerance for ambiguity, automatic negative thought and academic hardiness to determine the relationship and predictive power between these variables with academic hardiness among university students in Malaysia. According to the Theory of Hardiness, the components that construct and best predict hardiness are control, commitment and challenge (Kobasa, 1979). Demonstrating a relationship and predictive power between these variables with academic hardiness will lend further support to the previously established theory of hardiness. Besides, critical findings to school counsellors and career counsellors about how they may support university students in decreasing the possibility of students dropping out.

This study will provide insight into the effect of automatic thoughts on academic hardiness for a school counsellor or career counsellor on hardiness intervention. Counsellors can

take a step further to increase the effectiveness of hardiness intervention by considering cognitive approach intervention such as cognitive restructuring from cognitive behavioural therapy to promote academic hardiness. Automatic thoughts have a huge influence on affecting an individual's behaviours, emotions, cognitive and causing physical symptoms (Greenberger & Padesky, 1995). Through examining how automatic negative thoughts interact with academic hardiness among university students in Malaysia might shed a light on the promoting academic hardiness. Besides, a previous existing intervention which is hardiness educational program, which is a tool for stress management, has been found to facilitate learning hardiness (Jameson, 2013). However, the hardiness educational program emphasized to enhance the attitudes, coping strategies and interaction patterns of hardiness but inadequate attention and consideration of cognitive factors (Jameson, 2013).

Research Objectives

1. To examine the relationships between academic hardiness, academic locus of control, tolerance for ambiguity and student's engagement and automatic negative thought.

2. To predict academic hardiness by using academic locus of control, tolerance for ambiguity, student's engagement and automatic negative thought.

Research Questions

1. Is there a relationship between academic hardiness, academic locus of control, tolerance for ambiguity, student's engagement and automatic negative thoughts?

2. Does academic hardiness, academic locus of control, tolerance for ambiguity, student's engagement, and automatic negative thought can predict academic hardiness?

Research Hypotheses

H1: There is a positive relationship between academic hardiness with the academic locus of control, tolerance for ambiguity and student's engagement but negative relationship between academic hardiness with automatic negative thoughts.

H1a: There is a positive relationship between control components of academic hardiness and academic locus of control.

H1b: There is a positive relationship between commitment components of academic hardiness and academic locus of control.

H1c: There is a positive relationship between challenge components of academic hardiness and academic locus of control.

H1d: There is a positive relationship between control components of academic hardiness and tolerance of ambiguity.

H1e: There is a positive relationship between commitment components of academic hardiness and tolerance of ambiguity.

H1f: There is a positive relationship between challenge components of academic hardiness and tolerance of ambiguity.

H1g: There is a positive relationship between control components of academic hardiness and students' engagement.

H1h: There is a positive relationship between commitment components of academic hardiness and students' engagement.

H1i: There is a positive relationship between challenge components of academic hardiness and students' engagement.

H1j: There is a negative relationship between control components of academic hardiness and automatic negative thoughts.

H1k: There is a negative relationship between commitment components of academic hardiness and automatic negative thoughts.

H1l: There is a negative relationship between challenge components of academic hardiness and automatic negative thoughts.

H2: There will be a significant prediction of academic hardiness by the academic locus of control, tolerance for ambiguity, student's engagement and automatic negative thought.

Definition of Terms

Conceptual and Operational Definitions.

Academic Hardiness. Hardiness is defined by Maddi (2006) as a 'cognitive and emotional amalgam constituting a learned, growth-oriented, personality buffer' which can provide courage to overcome difficulties and turn negative circumstances into learning opportunities. Academic Hardiness scale or AHS (Benishek & Lopez, 2001) comprises 18 items that will be used in this research to assess the hardiness of students. The total score of academic hardiness scale with greater value indicates a higher level of hardiness.

Academic locus of control. Trice (1985) has defined academic locus of control as an expectation held by the learners that their behaviours can impact academic success and adjustment. Academic locus of control scale (Trice & Curtis, 2013) with 21-items is used in this research to access the internal locus of control of students. The lower the score of Academic locus of control scale indicates a stronger internal generalized belief in self-determination of the outcome.

Tolerance for ambiguity. Budner (1962) defined tolerance for ambiguity as "the tendency to perceive ambiguous situations as desirable" In this research, the 12-items that construct the Tolerance for ambiguity scale (Herman et al., 2010) which is refined from Burdner's (1962) 16-items scale will be used to access the tolerance of ambiguity of the students. The higher the score of the Tolerance for ambiguity scale indicates the greater affinity for the challenge (Rush, 1996).

Student's engagement. Student's engagement broadly defined by Nystrand and Gamoran (1992) as the "students' willingness to participate in routine school activities, such as attending classes, submitting required work, and following teachers' directions in class". Therefore, university students' engagement inventory (Maroco et al., 2016) or USEI which contains 15 items will be used to measure the commitment of students in an academic setting. The higher score of USEI indicates a higher level of commitment and engagement in the academic context.

Automatic negative thought. According to Clark and Beck (2011), automatic thought is defined as the cognitive model assets that thought processes underlie all psychological function, behaviour, and emotional states. Automatic thought questionnaires (Hollon & Kendall, 1980) or ATQ which consists of 8-items will be used in this research to access the frequency of the negative thoughts. The higher score of overall ATQ indicates the higher frequency of negative thoughts by students.

Chapter 2

Literature Review

Academic Hardiness

Hardiness refers to beliefs or attitudes which are a cognitive and emotional amalgam making up a learner, growth-oriented, personality buffer that provides the courage and motivation for an individual to change stressful situations from a potentially threatening situation into opportunities (Kobasa, 1979; Maddi, 1999, 2002, 2006). Hardiness is conceptualized as three interrelated components which include commitment, challenge, and control. According to Maddi (2006), an individual will believe it is crucial to stay engaged with activities and people even if the situation is stressful, as if he is strong in commitment. Isolation from the environment seems like a waste of time for him. An individual strong in control will believe that his effort can influence the outcomes instead of staying powerless and passive toward it, no matter how stressful the situation. An individual strong in challenge views stresses and challenges as a normal part of living even a chance for personal growth. They view security and comfort as threatening and more openness toward challenges and uncertainty.

A correlation study conducted by Sheard and Golby (2007) revealed that commitment and control are significantly correlated but commitment, control and challenge have no significant relationship with each other. However, the study revealed that all the hardiness components, including commitment, control and challenge have a significant relationship with hardiness. Control component showed the strongest relationship with hardiness, followed by the commitment component with hardiness. Challenge component showed the weakest but

significant relationship with hardiness compared to other components. This result is also supported by a meta-analysis study hardiness conducted by Eschleman and Bowling (2010). The result revealed that commitment component and control component have the strongest relationship however an inconsistent result revealed that commitment components, control component have moderate relationship. This result showed that all the components are linked but hardly identical (Kobasa, 1979; Eschleman & Bowling, 2010). Besides, the weakest relationship among challenge components with the other two components supports the argument that challenge is the unique component of the all three components of hardiness (Eschleman & Bowling, 2010).

Several studies revealed hardiness is not innate and can be developed and learned. A study showed that the students' psychological hardiness of the Birjand University of Medical Sciences increased remarkably after the commitment to CBT educational intervention (Sahranavard et al., 2019). The CBT education intervention contained 10 training sessions. This study also revealed that group training in stress management resulted in an increase in hardiness. Another quasi-experimental-based study with 40 high school students in Tehran took part showed that the hardiness of the control group was increased after committed to problem-solving training. A similar result is provided from a study conducted by Henderson (2015) that revealed that hardiness education can reduce stress and burnout risk on a registered nurse. Apart from that, a study also revealed that spiritual-religious intervention is effective in increasing the hardiness of mothers with complicated grief (Fateme et al., 2020). The results are consistent with the argument from Maddi (1997) that hardiness can be learned and developed.

Academic hardiness is a term coined by Benishek (2005) which originated from a combination of Hardiness Theory and Dweck's (2000) Theory of Academic Motivation. Although academic hardiness compose of three hardiness components which are commitment, control, and challenge, however, it differs slightly from Kobasa (1979) hardiness theory constructs. Students with high commitment would exhibit personal engagement and determination with all their courses consistently, even if their courses were difficult. Students with high control showed strong internal control, which especially in one's perceived ability to cope with academically related challenges and bound back from failure experiences. Students with high challenges would actively seek academic challenges and open to academic challenges, rather than avoidance.

A study conducted by Kamtsios and Evangelia (2015) revealed that academic hardiness is negatively associated with academic stress. Students low in academic hardiness were reported higher academic stress. This study provides evidence that commitment and challenges act as moderating variables of academic hardiness and students' daily university stressors. It is aligned so of the study conducted by (Abdollahi et al., 2020) that academic stress was negatively predicted by academic hardiness. Students with a high level of academic hardiness engage in school activities, open to academic challenges, and use hardy coping strategies to overcome academic disappointments and failures (Benishek, 2005; Abdollahi et al., 2020). Apart from that, there are several studies that have revealed academic hardiness is a powerful predictor of academic self-efficacy (Cheng et al., 2019; Jang et al., 2016). Academic achievement also found out that was positively correlated with academic hardiness from a study conducted by Abdollahi and Noltemeyer (2016). Despite the advantages of academic hardiness benefits for a student in a

different aspect are clear, however, research on the predictive variables on academic hardiness remains sparse.

Academic Locus of Control

According to Rotter (1966), internal locus of control refers to an individual perceives events to be depended upon his personal efforts and characteristics; external locus of control refers to an individual believes a majority of events are seen to be depended upon fate, a higher power, luck, environment and some attribute that are not under his own effort and control. The control component of hardiness constructed from Kobasa (1979) theory of hardiness is rooted within Rotter's concept of locus of control (Judkinsa et al., 2020). It is also supported by Rush (1999) that Rotter's locus of control is theoretically consistent with the control component of hardiness construct. Therefore, a specific locus of control in academic context is adopted in present study.

Trice (1985) extended Rotter's concept of locus of control into the academic context. He defined academic internal locus of control as the belief and expectation of students having the capacity to influence academic outcome, for instance, academic success and change. In contrast, academic external locus of control refers to the academic outcome, for instance, academic success and performance depend on environmental factors. According to Jane et al. (2018) that academic locus of control is well established that internal academic locus of control has a positive impact on academic achievement and learning. Locus of control has found out has close relation with motivation and metacognitive knowledge which involves a belief of the students about their academic performance (Jane et al, 2018).

Bartone (2013) found out that a high level of control in hardiness construct brings a high level of self-efficacy to an individual. Apart from that, there are several studies showing that academic locus of control is significantly associated with self-efficacy. These results are consistent with the study that was conducted by Muthui and Mutweleli (2020). This study is adopting Ex-Post-Facto research design and 291 students from 10 schools in Kenya were participants in this study. The result showed that internal academic locus of control has a positive and significant relationship with academic self-efficacy. Therefore, it highlighted that there might exist a positive relationship between academic locus of control and hardiness.

Tolerance of Ambiguity

One of the critical variables that closely related with the challenge component of hardiness construct is tolerance of ambiguity (Ayala et al., 2017; Ferreira, 2012; Plotka et al., 2017). Tolerance of ambiguity is firstly introduced by Frenkel-Brunswick (1949) which is defined as an 'emotional and perceptual personality variable.' Various tolerance of ambiguity features behaviour is found out, for instance, lack of ability to accept the possibility of good and bad traits exist in the same person, seeking for certainty and more likely to accept rigid attitude statements (Frenkel-Brunswick). A clearer definition of tolerance of ambiguity from Budner (1962) who defined tolerance of ambiguity as "the tendency to perceive ambiguous situations as desirable". However, intolerance of ambiguity refers to perceiving ambiguous situations as a threat. Apart from that, the similar concept of tolerance of ambiguity is tolerance of uncertainty. According to Grenier et al. (2005), time frame is the dominant characteristic that makes them distinct with each other. Tolerance of ambiguity refers to an individual's reaction to an

ambiguous situation in the present. However, tolerance of uncertainty refers to an individual's reaction to an uncertainty of the future.

According to Ayala et al. (2017), an individual with high hardiness possesses a high tolerance of ambiguity and cognitive, attitudinal and behavioural flexibility. It is consistent with Kobasa (1979) that people with high hardiness are open to alternative solutions to solve the problems and comfortable with unforeseen events. Instead of threat, they believed ambiguous challenges are an opportunity to grow. This is supported by Ferreira (2012) findings that individuals with high challenged components of hardiness construct are characterised by a high tolerance for ambiguity.

Past researcher revealed that ambiguity of ambiguity is critical variable in academic context, for instance, academic procrastination (Zarei & Khoshouei, 2016), academic achievement (Vahedi & Fatemi, 2016), and students' engagement (Farnaz & Jahangir, 2019). A cross-sectional study conducted by Mangione et al. (2018) which aimed to investigate the correlation between positive personal qualities included tolerance of ambiguity and academic burnout. This study recruited 739 participants and completed the study through an online survey. The result revealed that tolerance of ambiguity is inversely correlated with burnout. It might be because of students with low tolerance of ambiguity have a low challenge in hardiness construct students can't cope with academic challenges that exceed their limits and avoid the challenges (Benishek et al., 2015).

Student's Engagement

One of the variable's that closely represent the commitment component of academic hardiness construct is Student's engagement. Student's engagement refers to the devotion and

involvement of the students to their academic experiences, including learning tasks and activities. Student's engagement in the present study is conceptualization as a three-dimensional construct including cognitive, emotional and behavioural dimensions by Fredricks et al. (2014). This students' engagement construct can be integrated by four perspectives namely, psychological perspective, behavioural perspective, holistic perspective and sociol-cultural perspective. According to Maroco et al. (2016), cognitive engagement refers to the willingness and devotion of a student for the comprehension and mastering of complex ideas and difficult academic skill. The emotional engagement is referring to the positive and negative reactions that are reflected by students to classmates, school, school belonging, relationship between teacher and beliefs about the value of attending school. The behavioural engagement is referring to a student's commitment and involvement in academic tasks and school-related activities.

Past studies revealed that student's engagement is crucial for academic settings. Several studies revealed that student's engagement has a negative relationship with burnout (Maroco et al., 2020; Minjoeng et al., 2017; Schaufeli et al., 2002; Stoeber et al., 2011). According to Wang (2010), one of the main leading causes of immediate and persistent problems exhibited by students is low school engagement. It is also aligned with several studies on student's engagement and academic retention. These studies revealed that student's engagement had a positive significant relationship with academic retention and course completion rates (Bonet & Walters, 2016; Kahu & Lodge, 2018; Soffer & Cohen, 2019). A longitudinal study conducted by Wang et al. (2019) that aimed to investigate the relationship between behavioural engagement and academic performance among elementary school students. A total of 627 students are involved in this study. The result showed behavioural engagement has a positive relationship with academic achievement. Behavioural engagement also found out that as a significant

mediator of basic psychological needs satisfaction at school and academic achievement. These results are also supported by a meta-analysis study of the relationship between student's engagement and academic achievement by Lei et al. (2018). The results showed that the three dimensions of student's engagement, including behavioural, emotional and cognitive engagement had moderately strong and positive correlation with students' academic achievement. It is because of students with a high-level engagement involved more in school activities and academic tasks, which directly enhance student's achievement outcomes.

Automatic Negative Thoughts

One of the cognitive variables might be crucial for academic hardiness is automatic negative thoughts. According to Clark et al. (1999), automatic thoughts referred to evaluation of their worldview, people around them, environment and their future. One of the fundamental characteristics of automatic negative thinking is its autonomous attribute. Thus, automatic thoughts are hardly suppressing and occur autonomously. Automatic thoughts are rooted by core and intermediary beliefs. It was supported by Ellis (1994) that rational emotive behaviour theory argued irrational belief leads to automatic negative thoughts. Automatic negative thoughts are negative unwanted thoughts that appear into an individual's mind in facing distress (Beck, 1964). The leading cause of an individual developing negative expectations and thinking toward oneself, community and the future is automatic negative thoughts. It will prevent one's rational self-appraisal and appraisal of events by leading to a distorted and negative view of reality (Beck, 1964).

Past research revealed automatic negative thought plays an important role in academic settings. A study conducted by Miloseva (2011) which aimed for exploring the role of automatic negative thought in predicting school success and satisfaction in adolescents. The participants of this study comprise 230 students and 148 of them were female whereas 82 of them are male. The results showed that negative automatic thoughts significantly predicted school success and student satisfaction. Besides, a study conducted by Ohue et al. (2010) revealed that irrational belief and automatic negative thoughts were significantly related with burnout. Apart from that, automatic negative thoughts are founded to be a significant predictor of academic procrastination (Zacks & Hen, 2018). It is also supported by an experimental design study conducted by Ugwuanyi et al. (2020) which aimed to discover the effectiveness of a CBT-based program in decreasing undergraduate students' academic procrastination behaviours. The results showed that the students' academic procrastination behaviours were decreased significantly by disputing automatic negative thought after the CBT-based program.

Academic Hardiness and Academic Locus of control

Past researcher, Maddi (1999) found that component control was positively correlated with hardiness. It is also supported by Kobasa and Suzanne (1979) that there is a positive relationship between hardiness and internal locus of control. Besides, Maddi (2002) stated that the component control of the hardiness construct originates from Rotter's concept of locus of control (Rotter, Seeman, & Liverant, 1962). Another study by Kobasa et al. (1982) had similar findings that the disposition of control was negatively correlated with an external locus of control. Internal-External Locus of Control Scale (Rotter, 1966) has been used in his study to

measure control. The result is aligned with Johnson and Sarason (1978) that college students with a higher internal locus of control had a significantly lower correlation with stressful life events than those who are strong in an external locus of control. They can mitigate the influence of harmful effects of stressors. Apart from that, the relationship between hardiness and locus of control was also investigated in another way. A study conducted by Ganellen and Blaney (1984) by looking hardiness from the level of powerlessness. A negative correlation was founded between hardiness and powerlessness. Their study also revealed similar results of a positive relationship between internal locus of control and hardiness. A hardy individual has firm control over the environment factor who believes in a personal effort able to determine the outcome even the situation seen stressful and views passivity and powerlessness are meaningless (Maddi, 2006).

There are several studies founded out that locus of control is significantly associated with academic hardiness. Academic hardiness is found out to have a positive relationship with an internal locus of control and a negative relationship with an external locus of control (Abdollahi et al., 2020; Schultz & Schultz, 2016). Academic internal locus of control involves beliefs in one's own ability to determine the academic outcomes and able to manage academic stress through emotional self-regulation and hardy coping skills (Benishek et al., 2005). There are a few pasts research studies have revealed hardiness is positively associated with active coping strategies and negatively associated with maladaptive coping strategies, especially avoidance coping strategies (Bartone & Homish, 2020; William et al., 1992). Maroˆco et al. (2019) stated that passive and avoidance coping strategy is associated with an external locus of control, while an active coping strategy is associated with an internal locus of control. It is consistent with the empirical evidence provided by the past researchers (Anderson, 1977; Crisson & Keefe, 1988;

Folkman, 1984) that individuals with an internal locus of control apply active coping strategies while less likely to apply avoidance coping strategies than those with an external locus of control. Thus, the present study hypothesizes that academic locus of control will be positively correlated with university students' academic hardiness. Apart from that, the research gaps included out-to-date empirical findings and inadequate attention on the academic locus of control embolden the present study by establishing a more solid theoretical understanding of academic hardiness and academic locus of control.

Academic Hardiness and Tolerance for ambiguity

Past studies have found out that tolerance for ambiguity is significantly associated with hardiness (Atamanova & Bogomaz, 2014; Eidles-Maoz, 2006; Franco et al., 2020; Rezae et al., 2009). Ambiguity intolerance was found to be negatively related to challenges by Bardi and Ramdeny (2009). Individuals intolerant of ambiguity are more likely to avoid challenges. They appraise the stressful and uncertain situation as a threat, rather than growth opportunities. It is aligned with Kobasa (1979) that an individual who has a high challenge component of hardiness construct seeks challenges and comfort with uncertainty, especially changes by believing stressful situations as growing opportunities. A hardy individual possesses a high tolerance for ambiguity and great flexibility in cognitive, attitudinal, and behavioral (Ayala & Garcia, 2017; Hutchings, 1997). Psychological hardiness is related to higher-order thinking, especially critical thinking (Abdellatif & Abdel-Gawad, 2020). One of the essential elements of critical thinking is the tolerance of ambiguity. It can be open to uncertainty, accept challenges, and cognitive

flexibility (Abdellatif & Abdel-Gawad, 2020). Thus, this study hypothesizes that tolerance for ambiguity will be positively correlated with university students' academic hardiness.

A past study conducted by Vindeker et al. (2016) has discovered a similar result that tolerance for ambiguity is positively correlated with hardiness among secondary school students. Besides, a cross-sectional study conducted by Kuzikova (2019) has shown that tolerance of ambiguity has no direct impact on hardiness. However, tolerance of ambiguity is discovered that it affects hardiness indirectly with the existence of other variables, for instance, the need for self-development. These inconsistencies and inadequate attention to academic hardiness with tolerance for ambiguity resulted in highlighting the need to merge the past findings and reveal the interaction among these variables.

Academic Hardiness and Student's engagement

A study conducted by Lo Bue et al. (2013) aimed to investigate the relationship between hardiness, work engagement, and burnout. 171 service members who were involved in a force protection mission at Kabul International Airport took part in this study. A positive relationship between hardiness and work engagement is found throughout the study. The result revealed that hardiness significantly predicted work engagement through regression analysis. This result is similar to the study conducted by Choi and Kang (2012) which revealed that hardiness was a predictor of work engagement. Besides, the result also found that hardiness is positively correlated with work engagement among child counselors. According to Maddi (2002), hardy individuals are more likely to remain engaged themselves, rather than being isolated from stressful circumstances. Apart from that, a study conducted by Atkinson and Martin (2019)

investigates the relationship between hardiness and sport engagement. A similar result is got from this study that hardiness was positively correlated with sports engagement.

Several studies mentioned that student's engagement significantly related to academic hardiness (Abdollahi et al., 2020; Benishek & Lopez, 2001; Cole et al., 2004). A past study also revealed that academic hardiness is positively associated with school belonging (Abdollahi & Noltemeyer, 2018). School belonging is a core component of a student's engagement, which is described as interested and dedicated to engaging with school activities and involved in interpersonal relationships (Abdollahi et al., 2020). A study conducted by Vizoso et al., (2018) revealed a similar result that hardiness is positively associated with student engagement, however negatively associated with a maladaptive coping strategy. The possible explanation is that low hardiness students may believe that an external problem exists which cannot be overcome with personal effort, leading students to fall into a circle of academic disengagement (Marôco et al., 2020). Thus, the present study hypothesized that student engagement is positively correlated with academic hardiness.

Academic Hardiness and Automatic Negative Thoughts

Cognitive factors appear significantly correlated with hardiness. Research has shown that a wide range of cognitive factors plays an important role in cultivating the three components of hardiness (Nowack, 1989; Zhang & Wong, 2011). A study conducted by Williams et al. (1992) revealed that hardiness was significantly correlated with maladaptive coping in the form of wishful thinking and avoidance coping. The study revealed that individuals with maladaptive coping more likely have low hardiness. A cross-sectional study conducted by Mahmoud et al.

(2015) aimed for investigating the relationship between coping and negative thinking. This study recruited 4,000 participants who were full-time undergraduate students aged 18 to 24 years from the University of Kentucky Office of Records Custodian. The result has revealed that negative thinking is significantly predicted maladaptive coping. Besides, this study also revealed that maladaptive coping has no relationship with positive thinking. Although past research showed hardiness is related to cognitive factors however, it questioned the clarity of the relationship between automatic negative thoughts and academic hardiness.

A cross-sectional study conducted by Khaledian et al. (2016) aimed for discovering the relationship between psychological hardiness and irrational beliefs, emotional intelligence, and work holism among high school teachers. This study recruited 100 male and female high school teachers in Iran. This study revealed that there is a negative and significant relationship between hardiness and irrational beliefs. This result is supported by a quasi-experimental intervention study conducted by Jafar et al. (2015) that automatic negative thought has a negative relationship with psychological hardiness. The control group of this study showed a remarkable increase of psychological hardiness after committing to cognitive behavioural therapy-based stress management, which aimed at disputing automatic negative thoughts and adopting effective strategies to deal with stressful situations. Although the past study affirmed automatic negative thinking is negatively associated with hardiness, however, studies that have focused on automatic negative thoughts and academic hardiness are scarce. Thus, it signifies a substantial literature gap to be filled. Besides, the present study hypothesized automatic negative thought is negatively correlated with academic hardiness.

Predictors of Academic Hardiness

Kobasa and Maddi stated that locus of control has predictive power on psychological hardiness theoretically. Maddi also found out that the control component has a positive relationship with psychological hardiness. There are several studies mentioned that use Rotter's concept of locus of control to measure the control component of hardiness. Past researchers revealed that locus of control has significant predictions on coping styles (Petrosky & Birkimer, 1991). A study conducted by Bilibani et al. (2020) revealed that coping styles have a significant relationship with locus of control. It is further supported by a longitudinal study which was conducted by Heffer and Willoughby (2017) aimed to explore coping styles and change among undergraduate students which mentioned that coping styles is significantly predicted by locus of control. Besides, past studies have shown that coping styles have significant relationship with hardiness (Nanavaty et al., 2017; Nowack, 1989). Some past studies revealed coping styles and hardiness have reciprocal predictive relationships (Besharat, 2007). It is aligned with a study conducted by Dehghani and Kajbaf (2013) which aimed to explore the relationship between coping styles and hardiness among undergraduate students. The result showed active coping styles positively predicted hardiness, while as maladaptive coping styles negatively predicted hardiness. These studies have highlighted a high possibility that there is a significant predictive relationship between locus of control and hardiness. However, the predictive relationship between academic locus of control and academic hardiness remain unclear.

According to Kobasa (1982) theory of hardiness, tolerance of ambiguity has a significant predictive relationship with hardiness. It is also supported with a study by (Abdellatif & Abdel-Gawad, 2020) that ambiguity of tolerance can positively predict hardiness. According to

Abdellatif and Abdel-Gawad (2020), tolerance of ambiguity is associated with critical thinking which enables an individual to have high cognitive flexibility, ability to challenge and thoughtful risk. Besides, a study conducted by Zhang and Wong (2011) revealed that liberal thinking style positively predicted hardiness which specifically challenged the component of hardiness construct. Liberal thinking style is referring to an individual tolerance to ambiguity and prefers to involve themselves in novelty and ambiguity (Zhang & Sternberg, 2005). Apart from that past studies revealed hardiness, especially challenge components that have a significant positive relationship with openness (Ghorbani & Watson, 2005; Maddi, 2012; Merino-Tejedor et al., 2015; Zhang, 2011). Similar results shown in Merino-Tejedor et al. (2015) and Zhang (2011) studies that hardiness is positively predicted by openness. Besides, openness has the highest predictive power on the challenge component among other hardiness components. Bardi et al. (2009) argued that tolerance of ambiguity is a closely similar construct with openness. They share clear similarities to one another for instance they possess an ability to involve in challenge, novelty and uncertainty. According to a study conducted by Jach and Smillie (2020) revealed that tolerance of ambiguity has a significant positive relationship with openness. A study revealed that there is a positive predictive relationship between tolerance of ambiguity and openness (Jach & Smillie, 2019). Thus, present study assumed that tolerance of ambiguity can predict academic hardiness meanwhile tolerance of ambiguity has higher predictive power on the challenge component. Currently, studies that have focused on predicting academic hardiness by tolerance of ambiguity remain sparse, which highlights a literature gap to be filled.

According to Benishek and Lopez (2001), student's engagement is one predictor of academic hardiness, especially the commitment component of hardiness. It is also supported by a study conducted by Kuo et al. (2017) that student's engagement has a positive predictive

relationship with academic hardiness. The result showed emotional engagement has a significant positive predictive relationship with all the three components of hardiness. It is also aligned with a study conducted by Adollahi et al. (2020) that academic engagement is positively predicted by student engagements. One objective in this study is to discover the predictive relationship between sense of belonging to school, academic hardiness, and academic stress. The results showed that a sense of belonging to school positively predicted academic hardiness. Students with high engagement have commitment to school and dedicate themselves to academic tasks and school-related activities. Even the tasks and circumstances are challenging (Benishek & Lopez). A time-lagged design research conducted by Ayala and Manzano (2018) also showed similar results that student's engagement has a significant predictive relationship with hardiness. This study conducted a total of 748 full-time university students, and the data were collected at three times, which was the second week of September 2015, fourth week of November 2015 and last week of July 2016. Apart from that, there are several studies (Corso-de-Zúñiga et al., 2020; Kittredge, 2010; Lo Bue et al., 2013) that using work engagement instrument instead of student's engagement instrument revealed similar result with those equip student's engagement instrument that there is a positive predictive relationship between student's engagement and hardiness among university student.

According to Kobasa and Maddi (2001), automatic thought might have predictive power on hardiness. Past researchers found out that hardiness can be enhanced through hardiness training programmes (Maddi et al., 1998). One of the major parts of the hardiness training programme incorporates cognitive behavioural techniques (Maddi et al., 1998) for instance cognitive reconstructing which involve identifying and disputing irrational or automatic negative thoughts (Hope et al., 2010). It is also supported by past research hardiness training has a

significant effect on increasing hardiness among college students (Hasel et al., 2011) and nursing students (Jameson, 2014). Apart from that, there are also several studies revealed hardiness is increased after disputing and decreasing their automatic negative thought through cognitive behavioural therapy-based intervention (Jafar et al., 2016; Thompson, 2017). However, there is only one study that was conducted by Gustanti et al. (2019) focusing on the effectiveness of cognitive behavioural therapy-based intervention on academic hardiness. This study revealed academic hardiness ballooned after disputing the automatic negative thought. Therefore, a predictive relationship might exist between automatic negative thought and academic hardiness. Besides, there is one study conducted by Warren and Hale (2020) that revealed that grit and resilience are significantly predicted by rational belief and irrational belief. They suggested further exploration of other non-cognitive factors based on irrational belief. A study conducted by Buschman et al. (2017) provided empirical evidence that automatic negative thoughts are rooted by irrational belief. Thus, present study takes a step further to investigate the predictive relationship between automatic negative thoughts and academic hardiness.

Theoretical Framework

Theory of Hardiness. The theory of hardiness by Kobasa (1979) was adopted in conceptualizing a framework for the present study. Hardiness is conceptualized as a cognitive and emotional amalgam of hardy attitudes or belief while as hardy actions as hardy mechanisms for dealing with stressful circumstances effectively. Hardiness is composed of interrelated attitudes of control, commitment, and challenge which helps to turn stressful circumstances into growing opportunity (Maddi, 1997). It is significant that it is the combination all of three

components of hardiness which include commitment, control, and challenge that constitute hardiness (Maddi, 2002),

Theory of hardiness is related to existential psychology. According to Kobasa (1979) and Maddi (2002), the combination of control, commitment and challenge constituting hardiness constitute the best operationalization of existential courage. Existential psychology stated that personal development and fulfilment leaded by every decision made by an individual (Frankl, 1960; Kierkegaard, 1954). However, there will be arousal of ontological anxiety that block people from making future-oriented decisions despite the anxiety and stress of uncertainty. Therefore, existential courage serves as a key role to be provoked regularly toward every valuable future-oriented choice. According to Maddi (2002), hardiness structure the perception toward the world and self-perception which will provide motivation to overcome stressful circumstances and difficulties.

Academic hardiness coined by Benishek and Lopez's (2001) with Kobasa (1979) theory of hardiness and Dweck and Leggett's (1988) Model of Academic Motivation. They generate the three dimensions which include control, commitment and challenge of hardiness in the specific nature of the academic setting. The three dimensions of academic hardiness are based on learning goals oriented. Students who are learning goals oriented will view academic challenges as opportunities for personal growth and personal development. Failure is viewed as normal for the learning process. These students have higher involvement in academic tasks, prefer challenging tasks and not give up easily as facing failure (Dweck & Leggett, 1988).

Control is referring to the belief that an individual can influence and determine the outcome of life events (Kobasa, 1979). Individuals who have a low sense of control will feel powerless and less healthy than individuals with great sense of control as they are facing

stressful circumstances. Great sense of control involves decisional control, cognitive control and coping skills. Individuals with great sense of control have the capability to decide among various actions to deal with stress, ability to interpret and incorporate the stressful events into their life plan with effective adaptation and changes and can cope with stress effectively. Control component also originated from Rotter's concept of internal locus of control (Kobasa, 1979). It is also supported by Rush (1995) that Rotter's concept of internal locus of control is theoretically similar as control component of hardiness. Therefore, present study adopts academic locus of control as control variable.

Commitment is referred to as a belief system that the perceived threat and a stressful circumstance can be minimized through stay committed to all areas of life (Kobasa, 1979; Maddi, 2002). Sense of purpose is the core element that buffers the encounter of stress which prevents an individual from giving up on engaging with all areas of life (Kobasa, 1979). Individuals with high commitment feels an engagement as a protective source to deal with stress. Therefore, individuals with high commitment will remain the commitment and involvement to institution, works, society, family and friends despite the stressful circumstances. One of the variables that closely related to the commitment component of hardiness is students' engagement which is adopted in present study.

Challenge is referring to a belief held by individuals under stress that believe change as a challenge, rather than a threat (Kobasa, 1979; Maddi, 2002). Individuals with a high challenge view change positively as an enhancement in their environment. Besides, they have the ability to explore their environment and further adopt the resources which become their aid to cope with stressful circumstances. Cognitive flexibility and tolerance of ambiguity are similar as challenge (Ayala et al., 2017). They are open to challenges and uncertainty and deal with the threat in a

new environment effectively. According to Rush (1995), tolerance of ambiguity is theoretically consistent with the challenge component of hardiness. Thus, present study adopts tolerance of ambiguity as one of our independent variables.

Cognitive behavioral therapy. Cognitive behavioral therapy (CBT) was developed by Beck (1964) which argued that emotions and behaviors depend on their perceptions and interpretation of events but not the situation that influences their emotions and behaviors. The theoretical model of CBT is incorporating the concept of schema activation. Schemas often tend to influence the information processing system. Moreover, schemas can be reinforced by experiencing similar adverse and stressful events. However, the strengthened maladaptive and dysfunctional schemas will cause an individual to experience psychopathological symptomatology as the dysfunctional schemas are activated (Beck and Haigh 2014). Emotional disorders and cognitive distortions are caused by interpretation of events and meaning generation processes that are influenced by maladaptive and dysfunctional schemas (Beck 1979). Schema content exists in the form of beliefs according to cognitive models (Buschmann et al., 2017). The fundamental cognitive model of CBT can be outlined by three levels of cognition which include core beliefs, dysfunctional assumptions and negative automatic thoughts (Beck, 1976). Core beliefs or schemas refer as the innermost level of beliefs which often to be absolutistic and are the root of the views about ourselves, others and the world for instance ‘I’m useless’, ‘The world is unfair’ and ‘Things will never work out for me’. Dysfunctional assumptions refer to rigid and often unrealistic maladaptive assumptions that are adopted by people which control people's behaviors (Fenn & Byrne, 2013). The dysfunctional assumptions often expressed in terms of ‘must’, ‘should’ or ‘if…then’. Automatic thought is thought to be instantaneous, nonconscious and specific which is described as occurring in ‘telegraphic style’ (Beck, 1964).

The fundamental of automatic thought is core belief and intermediate belief or dysfunctional assumption. People's reaction or response in certain situations are influenced by their automatic thoughts (Fenn & Byrne, 2013). Automatic negative thoughts are thoughts that are negative and activated in certain negative and stressful situations involuntarily. The automatic negative thoughts are differing between the situation (Clark & Beck, 2011). Furthermore, one of the CBT formulation models is the hot-cross bun model by Greenberger and Padesky (1995). The hot-cross bun model explained how thinking, feelings, behaviours and body sensations interact with each other. With that said, academic hardiness might be predicted and related with automatic negative thoughts due to the automatic thoughts might influence the three components of hardiness which include control, challenge and commitment. Therefore, automatic negative thoughts are adopted in present study.

Conceptual Framework

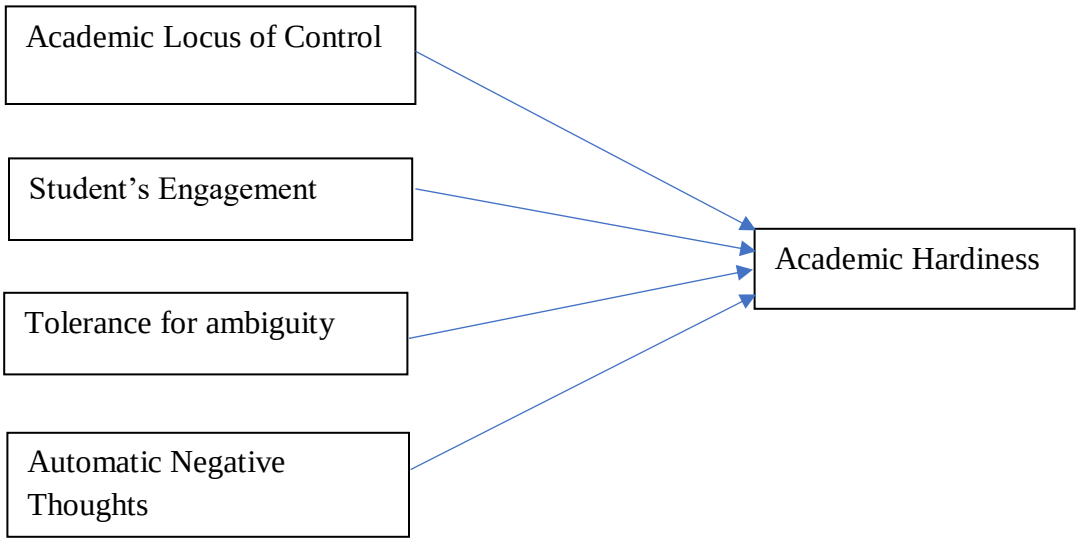

Figure 1. *The conceptual framework of "Academic hardiness among Malaysian University students: Academic Locus of control, student's engagement, tolerance for ambiguity and automatic negative thoughts".*

The research aims to study how an individual's academic locus of control, student's engagement, tolerance for ambiguity as well as automatic negative thoughts correlate with academic hardiness. In this research, academic hardiness represents the dependent variable (DV), whereas, academic locus of control, student's engagement, tolerance for ambiguity as well as automatic negative thoughts represent the independent variables (IV). The correlation model and regression model between academic indecision, tolerance for ambiguity, student's engagement, automatic negative thoughts and academic locus of control will be identified using the quantitative method, namely correlation analysis and regression analysis.

Chapter 3

Methodology

Research Design

This study adopted quantitative and correlational research design to answer the questions on relationships between academic locus of control, tolerance of ambiguity, student's engagement, tolerance of ambiguity and automatic negative thoughts. Quantitative research design is a design that provides a statistical conclusion by collecting and analysing numerical data among representative samples of population (Lowhorn, 2007). Primary data that was collected in this study included data of academic hardiness, academic locus of control, tolerance of ambiguity, students' engagement, and automatic negative thought among Malaysian University students. Primary data is data that is originally collected by researchers from first-hand sources (Salkind, 2010). Cross-sectional study known as one-shot study which conducts observational study by study exposure and the results of respondents at only one point of time (Pandis, 2014). Therefore, a cross-sectional-design study was conducted to discover academic hardiness of Malaysian University students at a single point in time with survey methods. Self-report questionnaire is a questionnaire that respondents can answer the questionnaire without any interference or interviewer. Thus, this study has used self-report questionnaires through survey methods due to the intention to obtain a large group of samples at one time voluntarily (Paulhus & Vazire, 2009)

Sampling Procedures

Sampling Method

A non-probability sampling method which is purposive sampling that has been used in this study. It is due to the objective of this study which aimed to discover academic hardiness among the Malaysian University students. There were several inclusion and exclusion for the sample (refer to section Data Collection Procedure). Besides, the benefits of this sampling method were cost saving, time saving, and meaningful results can be contributed to the research by targeting on samples that meet the criteria of the study (Etikan, Musa & Alkassim, 2016).

Malaysian University students who are currently pursuing their study in Malaysia are desired participants in this study. The reason for Malaysian University students has been chosen as the target population is that they faced high academic stress and have high risk of drop out (Amran, 2018, Elias et al., 2011). According to Beh (2016), Malaysian university students had overall 10% to 14% dropout rate which called attention to high attrition rate and university students dropping out issues. It caused negative impacts toward the tertiary education institution in various ways for instance unhealthy image of the university or college was developed, decreasing the students enrollment rate and decreasing the revenue of the education institutions (Edward & Pichyada, 2019).

Therefore, Malaysian University students are targeted in this study to explore the relationship between academic hardiness, academic locus of control, tolerance of ambiguity, students' engagement, and automatic negative thoughts.

Location of Study

An online survey questionnaire has been generated using Google Form and was shared on several social media including Facebook, Instagram, and WeChat in order to maximize the number of respondents. The data was collected among Malaysian University students across Malaysia which involve 13 states and 3 federal states.

Ethical Clearance Approval

The university ethical clearance protocol that was gained through my Supervisor (Mr Ho Khee Hoong), Head of Department of Psychology Programme (Dr Chie Chiu Ting), Dean of Faculty of Art and Social Science (Dr Lee Lai Meng), as well as the UTAR Scientific and Ethical Review Committee to ensure that there are no violations of any ethical concern before the commencement data collection. After the completion of the current research proposal, the application process of ethical clearance started directly. The lengthy procedures of ethical clearance had been considered in this present study to ensure that the data collection procedures will be in time to finish the data analysis. Data collection procedure has been conducted after obtaining the ethical approval for the current study (Re: U/SERC/209/2020)

Sample Size, Power, and Precision

Sample Size

The sample size generator software that used to obtain sample size was G*Power 3.1.9.4. version. This study required a minimum number of 67 respondents to participate in the study based on several methods used to calculate the sample size. Besides, the sample size of this study has been increased by 50% of 67 respondents. It is due to the possibilities of non-responsive data and missing data present after the data collection (Salkind, 2012). Therefore, the

accuracy of the results can be increased by 40% to 50% of the sample size through accumulating the outliers and incomplete data in this study. As a result, the final sample size of the present study after increasing 50% was (n = 101).

Actual Sample Size

The final sample size of this study consisted of 94 university students; age ranged between 18 to 26 years (M = 21.69 years; SD = 1.90 years). The sample consisted of 55.24% female respondents (n = 58) and 44.76 % of male respondents (n = 47). Initially, a total of 105 responses were collected in this present study. However, there was one unengaged response which was removed from this present study. Thus, a total of 104 valid responses were kept as the final sample of this present study for further analysis.

Power Analysis

According to G*Power 3.1.9.4, to calculate Hypothesis 1, Pearson's Product-Moment Correlation (PPMC) was used to investigate the relationship between academic locus of control, tolerance of ambiguity, students' engagement, automatic negative thought, and academic hardiness. 'Exact' has been chosen as the test family and the statistical test is 'Correlation: Bivariate normal model.' which suggested the sample size of 67. A medium effect size will be chosen which is 0.3 in this study. According to Cohen et al. (2013), one of the strategies for choosing effect size is choosing based on conventional effect size. The medium effect size for bivariate correlational is 0.3. In addition, a study conducted by Martin (2015) to investigate the relationship between hardiness and engagement has revealed effect size of 0.38. Therefore, a medium effect size will be used in this study. The power is 0.80 while the margin of error is 0.05.

According to G*Power 3.1.9.4, to calculate Hypothesis 2, Multiple Linear Regression (MLR) is used to predict academic hardiness by academic locus of control, students' engagement, tolerance of ambiguity and automatic negative thought. 'T tests' is chosen as the test family and 'Linear multiple regression: Fixed model, single regression coefficient' is used as a statistical test. It suggested a sample size of 55. The power input was .80 and alpha error probability was .05 which was the same with PPMC. The effect size will be used in this power analysis is 0.15 which is conventional medium effect size for multilinear regression analysis (Cohen, 1998). In addition, a medium effect size is revealed in a regression study of hardiness and engagement which is 0.16 (Ayala & Manzano, 2018). Since 0.16 is above medium effect but lower than large effect size. Therefore, a medium effect size will be used in this study.

In brief, the G*Power suggested 67 of sample size for Pearson's Product-Moment Correlation and 55 of sample size for Multiple Linear Regression. Therefore, the higher number was chosen to ensure all the minimum sample size is achieved.

Data Collection Procedures

Inclusion and Exclusion Criteria

The inclusion criteria included: (i) Respondents must be Malaysian, (ii) Respondents must pursue his or her study at any universities in Malaysia currently. However, respondents who are Malaysian and pursuing his or her study at university in Malaysia but involved in overseas exchange student programmes excluded in this study. This is because this study intended to measure hardiness only within the Malaysian context.

Procedures of Obtaining Consent

The informed consent has been obtained from the participants by using the online survey via google form. Participants were required to agree to informed consent after reading the participant information sheet. This helps participants to have full understanding of the information stated in the participant information sheet. Participants were directed to the survey questionnaire as they have agreed to participate in this study. The participant information sheet contained details of the survey such as the purpose of the study, confidentiality, voluntary participation, and the contact information of the researchers which enabled participants to reach researchers as they faced difficulties or problems throughout the survey. The information of participants had been kept private and confidential which the data only used for academic purposes. This informed consent also ensured that their participation is fully voluntary. However, they can withdraw from the study as they feel uncomfortable without any consequences and penalty.

Data Collection Procedures

An online questionnaire created on google form and shared on Social networking sites such as Instagram, WeChat, and Facebook to get responses. The social distancing has been assured by collecting data through online surveys instead of paper-and-pencil questionnaires during this COVID-19 pandemic. This survey questionnaire consisted of different section which included demographic information, Academic Hardiness Scale (AHS), Academic Locus of Control Scale (ALOC), Tolerance of Ambiguity Scale (TA), University Student Engagement Inventory (USEI), and Automatic Negative Thoughts (ANT). The demographic information had included the participants demographic data for instance gender, age, name of university, course and status of study (Full time/ Part time). Besides, the name and the email of the participants were not required and recorded to ensure their privacy and anonymity in this study. The data was

collected in google form database. Apart from that, the duration for completing the data collection was 32 days which was from 6/1/2021 to 6/2/2021.

Pilot Study. A pilot study was conducted before the actual study. Pilot study is a small-scale preliminary study that aimed to evaluate the feasibility of the study design. A total of 30 samples were collected to assess the reliability. In short, the Cronbach's alpha of the instruments was above the acceptable range of .70 (Keith, 2017). Thus, all instruments were used without alteration. The reliability test reported that the instruments or questionnaires adopted in this study showed great reliability. (see Table 3.1)

Actual Study. All items were retained in the actual study as the instruments and questionnaires in the pilot study showed satisfactory Cronbach's alpha range of .70. According to Keith (2017), the acceptable reliability for each scale or instrument was .70 and above. Therefore, there was no alteration conducted to the instruments in actual study. The online survey questionnaires were distributed through different social networking sites such as WhatsApp, Instagram, Facebook, and WeChat in order to fulfil the number of participants. There was a total of 105 respondents recruited however there were respondents who were used in actual study. Apart from that, all the instruments used in actual study showed great Cronbach alphas (see Table 3.1).

Table 3.1

Reliability of Instruments in Pilot study (n=30) and Actual Study (n = 94)

Variable	Number of Items	Cronbach's alpha Pilot Study	Cronbach's alpha Actual Study
AHS	18	.71	.70
ALOC	28	.71	.77

ANT	8	.83	.91
TA	12	.82	.74
USEI	15	.85	.85

Note. AHS = Academic Hardiness Scale, ALOC = Academic Locus of Control, ANT = Automatic Negative Thought, TA = Tolerance of Ambiguity, and USEI = University Students' Engagement Inventory.

Instruments

The instruments used in this study were Academic Hardiness Scale (Benishek & Lopez, 2001), Academic Locus of Control Scale (Trice & Curtis, 2013), Tolerance for Ambiguity Scale (Herman et al., 2010), University Students' Engagement Inventory (Maroco et al., 2016), and Automatic Thought Questionnaires (Hollon & Kendall, 1980).

Academic Hardiness. This Scale was created by Benishek and Lopez (2001); with an 18-item self-report instrument on a four-response Likert scale. This instrument was designed to gather information about student attitudes regarding academic success. The academic hardiness scale can be categorized into three dimensions which include control, commitment, and challenge. The four response options range from 1 = completely false to 4 = completely true. Therefore, the possible minimum score was 18 and the maximum was 72. A sample item from this scale includes "Take my work as a student seriously". Item 1 to item 11 is related to commitment dimension, item 12 to item 16 are related to challenge dimension and item 17 to item 18 is related to control dimension. The higher the score of academic hardiness indicates a higher level of academic hardiness. The psychometric properties of this scale have shown that the reliability was 0.86 (Benishek and Lopez 2001). In addition, a study about psychometric properties of academic hardiness scale conducted by Weigold et al. (2016) revealed that

academic hardiness scale showed great convergent validity, discriminant validity as well as evidence of predictive validity of academic hardiness scale.

Academic locus of control. Academic locus of control scale (Trice & Curtis, 2013) with 28-items is used in this research to access the internal locus of control of students. It is a 5-point Likert scale ranging from 'strongly disagree = 1 to strongly disagree = 5 and Neither agree nor disagree = 3' to measure the construct of locus of control in the college or university context. Therefore, the possible minimum score was 28 and the maximum was 140. A sample from this scale includes "I sometimes feel that there is nothing I can do to improve my situation.". The lower the score of academic locus of control scale indicates a stronger internal generalized belief in self-determination of the outcome (Trice & Curtis, 2013). This scale shows great test-retest reliability and internal consistency which is .92 and .70. In addition, the concurrent validity of this scale is supported by a .50 correlation with Rotter's internal-external scale.

Tolerance for ambiguity. In this research, the 12-items that construct the Tolerance for ambiguity scale (Herman et al., 2010) which is refined from Burdner's (1962) 16-items scale will be used to access the tolerance of ambiguity of the students. All items are scored on a 5-point Likert scale, ranging from 'strongly disagree = 1 to strongly disagree = 5 and Neither agree nor disagree = 3'. Therefore, the possible minimum score was 12 and the maximum was 60. A sample item from this scale is "I avoid settings where people don't share my values.". The higher the score of the Tolerance for ambiguity scale indicates the greater affinity for the challenge (Rush, 1996). The 12-items of Tolerance for ambiguity scale display a great reliability with overall measure of .73 for internal consistency.

Student's engagement. University students' engagement inventory (Maroco et al., 2016) or USEI which contains 15 items will be used to measure the commitment of students in an

academic setting. USEI has three dimensions which include behaviour engagement, emotional engagement and cognitive engagement. The higher score of USEI indicates a higher level of commitment and engagement in the academic context. Besides, USEI adopts a likert-type scale with options from '1-never to 5-always'. Therefore, the possible minimum score was 15 and the maximum was 75. A sample item from this inventory includes "I pay attention in class.". The item 1 to item 5 is related to behavioural engagement dimension, the item 6 to item 10 is related to emotional engagement, and the item 11 to item 15 is related to cognitive engagement. USEI showed a great reliability with a score of around .88 (Maroco et al., 2016). In addition, USEI supported by factorial, convergent and discriminant validity based on the study conducted by Maroco et al. (2016)

Automatic negative thought. Automatic thought questionnaires (Hollon & Kendall, 1980) or ATQ which consists of 8-items will be used in this research to access the frequency of the negative thoughts. The response option of ATQ with scale of 1 (not at all) to 5 (all the time). Therefore, the possible minimum score for Automatic thought questionnaires was 8 and the maximum was 40. A sample item of this scale includes "I'm no good.". The higher score of overall ATQ indicates the higher frequency of negative thoughts by students. ATQ showed good reliability in terms of a high internal consistency with a score of .92. ATQ showed a strong correlation with the BDI and MMPI-D which supported the concurrent validity of the ATQ.

Chapter 4

Results

Descriptive Statistics

Demographic Characteristics

Table 4.1 below reported the demographic information of the respondents in the present study. There were 94 respondents who aged between 18 to 26 (M = 21.95 , SD = 1.90). There were 55.3% of the respondents were female respondents (n = 52) and 44.7% (n = 42) of them were male respondents. All of the respondents were pursuing a fulltime degree course. Most of the respondents were from University of Tunku Abdul Rahman which were 52.13% of them (n = 49). The others University students that involved in this study included Tunku Abdul Rahman University College, Universiti Kebangsaan Malaysia, Universiti Pendidikan Sultan Idris(UPSI), University of Nottingham Malaysia Campus, University of Malaya, University Sains Malaysia, International Medical University, Institute Pendidikan Guru, HELP University, Swinburne University of Technology Sarawak, Monash University, Methodist Pilley Institute, Multimedia University, Nanyang Polytechnic, Brickfields Asia College and Asia Pacific University. There were 25.53% of the respondents (n = 24) grouped under the field of science, followed by business, finance, accounting (n = 23; 24.47%), social science (n = 17; 18.08%), education (n = 12; 12.77%), Computer, engineer (n = 11; 11.70%), and foundation (n = 7; 7.45%).

Table 4.1

Demographic Information of Participants (n = 94)

	n	%	*M*	*SD*	Min	Max
Gender						
Male	42	44.7				
Female	52	55.3				
Age			21.95	1.90	18	26
18	4	4.3				
19	5	5.3				
20	12	12.8				
21	23	24.5				
22	17	18.1				
23	20	21.3				
24	7	7.5				
25	2	2.1				
26	4	4.3				
Programme						
Science	24	25.5				
Business	23	24.5				
Social Science	17	18.1				
Education	12	12.8				
Computer	11	11.7				
Foundation	7	7.5				

Note, n = number of cases; *%* = percentage; *M* = mean; *SD* = standard deviation; Min = minimum value; Max = maximum value

Descriptive Statistics of Topic-Specific Variables

The frequency distribution scores of the respondents on academic hardiness, academic locus of control, tolerance of ambiguity, automatic negative thoughts and university student engagement were reported in Table 4.2. The classification of scores was set by the mean score of

each variable as the cut-off point for low class (below mean) and high class (above mean). It was because authors did not state the classification of scores. Academic hardiness had a mean score of 49.31, where 52.13% of respondents experienced low levels of academic hardiness (n = 49), while 47.87% of respondents experienced high levels of academic hardiness (n = 45). The mean score of academic locus of control was 81.53, where 47.87% of respondents experienced low levels of academic locus of control (n = 45), while 52.13% of respondents experienced high levels of academic locus of control (n = *49*). Besides academic locus of control, automatic negative thought had a mean score of 17.46, where 61.70% of respondents had experienced low frequency of automatic negative thought (n= 58), while 38.30% of respondents had experienced high frequency of automatic negative thought (n= 36). Other than automatic negative thought, the mean score of tolerance of ambiguity was 36.03, while 54.26% of respondents had experienced low level of tolerance of ambiguity (n = 51), while 45.74% of respondents experienced high level of tolerance of ambiguity (n = 43). Lastly, the mean score of university student engagement was 52.70, while 45.74% of respondents had low levels of student's engagement (n = 43), while 54.26% of respondents had high levels of student's engagement in university (n = 51).

Table 4.2

Frequency Distribution of Topic-Specific Characteristics (i.e., Academic Hardiness, Academic Locus of Control, Automatic Negative Thought, Tolerance of Ambiguity and University Students' engagement) (n =94)

	n	*%*	*M*	*SD*	Min	Max
Academic Hardiness			49.31	4.37	37.00	58.00
Low (<49.31)	49	52.13				
High (≥49.31)	45	47.87				

Academic Locus of Control			81.53	8.50	62.00	102.00
Low (<81.53)	45	47.87				
High (≥81.53)	49	52.13				
Automatic Negative Thought			17.46	5.41	8.00	34.00
Low (<17.46)	58	61.70				
High (≥17.46)	36	38.30				
Tolerance of Ambiguity			36.03	3.21	29.00	44.00
Low (<36.03)	51	54.26				
High (≥36.03)	43	45.74				
University Students' Engagement			52.70	6.55	37.00	68.00
Low (<52.70)	43	45.74				
Hight (≥52.70)	51	54.26				

Note. n = number of cases; *%* = percentage; M = mean; SD = standard deviation; Min = minimum value; Max = maximum value.

Data Diagnostic and Missing Data

Frequency and Percentages Missing Data

There was no missing data in this study after completing the missing data detection. However, there was one unengaged response which is case 53. Case 53 was deleted from this present study because it was enough to achieve the required minimum number of respondents which is 67. As a result, there were valid 104 data which were able to proceed the further data analysis.

Methods for Addressing Missing Data

The function of MS Excel was used to detect the missing data. The function that is used for addressing missing data is 'countblank' for instance '=countblank(A2 to BZ2)", A2 to BZ2 is the data for each instrument from row A2 to BZ2. Moreover, the missing data can be detected in Google form. Participants only can proceed to the next section as they fill up all the questions in order to avoid missing data. Thus, the respondents with missing data had not been participating

in at least one of the 5 section of the survey. The responses with missing data would be filtered out. However, there was no missing data in this study.

Criteria for Post Data-Collection Exclusion of Participants

According to Gyasi et al. (2017), the number of missing data must not be more than 20% within a case to impute the missing data. The missing that more than 20% will lead to significant bias because of the high standard errors and representative errors that due to high missing value. However, the imputation did not take place but would discard all cases with missing values.

The following criteria of exclusion is to exclude data that show unengaged response throughout the study. The equation that was used to detect unengaged response is "=STDEV.S(A2:DO2)", A2 to DO2 is the response for each question that was selected to analyse the unengaged response. According to Gyasi et al. (2017), the data showed a score below .50 will be considered as an unengaged response.

Apart from that, the outliers also will be violating the normality of the data. JASP 0.12.2.0 will be used to detect the outliers by using boxplot. Several outliers were detected through JASP (refer to section Analyses of Data Distributions). By checking the kurtosis, skewness, and Shapiro Wilk of the data in order to avoid the data that affecting the normality.

Criteria for Imputation of Missing Data

The data exclusion was done with discarding the responses in post data-collection exclusion. The main reasons that cases with less than 80% of completion will be removed is there will be affection toward the reliability and accuracy of the result. Thus, the withdrawing cases action will be done toward data with more than 20% of missing data (Gyasi et al., 2017). The method for the imputation of missing data was imputing all the missing ordinal level datas

with their median relatively. However, there was no missing data in present study, therefore, there was no imputation of missing data conducted.

Analyses of Data Distributions

Normality of Variables. The normality tests that involved in this study included skewness, kurtosis, Shapiro Wilk and boxplot for all the variables which included academic hardiness, academic locus of control, automatic negative thoughts, student's engagement, and tolerance of ambiguity. The outliers that were detected with skewness, kurtosis and boxplot were being deleted in present study (refer to section Skewness and Kurtosis; Boxplot and Outliers). According to Mishra et al. (2019), central tendency and statistical methods for data analysis can only be determined and decided through checking the normality of data.

Skewness and Kurtosis. Method that used to determine the normality of data were skewness and kurtosis. Another benefit of using method of skewness and kurtosis was checking for the outliers that exist in the data set. The standard score for the normality of data was not exceed ±2.00 for skewness and kurtosis. The skewness of academic hardiness, academic locus of control, tolerance of ambiguity, university student's engagement, and automatic negative thoughts were -0.147, 0.017, 0.337, -0.258 and 1.130 respectively based on Table 4.3. The kurtosis of academic hardiness, academic locus of control, tolerance of ambiguity, university student's engagement, and automatic negative thoughts were 0.149, 0.181, 0.427, 0.757, and 1.378 respectively. Most of the variables were positively skewed except academic hardiness and university student's engagement. In addition, all the variables showed positive values of kurtosis which represented leptokurtic forms of kurtosis.

Table 4.3

Skewness, Kurtosis, and Shapiro Wilk Table

	Skewness	**Kurtosis**	**Shapiro Wilk**
Academic Hardiness	-.147	.149	.269
Academic Locus of Control	.017	.181	.447
Tolerance of Ambiguity	.337	.427	.121
University Students' Engagement	-.258	.757	.171
Automatic Negative Thoughts	1.130	1.378	.000

Boxplot and Outliers. The boxplot revealed that there were outliers among all the variables (Appendix B). There were one outliers (Case 36) in academic hardiness, three outliers (Case 1, 70 and 36) in automatic negative thoughts, one outliers (Case 8) in academic locus of control, one outliers (Case 94) in tolerance of ambiguity and five outliers (Case 19, 67, 49, 35, 41 and 36) According to , the outlier is data that significantly differ from others which may has problematic influence and lead to bias toward the study. All the outliers were decided to eliminate from the study to ensure the accuracy of the study.

Data Analysis

H_1: There is a positive relationship between academic hardiness with the academic locus of control, tolerance for ambiguity and student's engagement but negative relationship between academic hardiness with automatic negative thoughts.

H_{1a}: There is a positive relationship between control components of academic hardiness and academic locus of control.

The assumptions of PPMC were observed, including normality of distribution based on Skewness and Kurtosis which can refer to Table 4.3 and random sampling from population. The Shapiro-Wilk Test for bivariate normality showed $p = .085$ which was greater than .05. Therefore, the assumptions of PPMC was met.

Pearson Product-Moment Correlation was conducted to study the relationship between academic hardiness and academic locus of control. Based on the results shown in Table 4.4, $r\ (94) = .352$, $p < .001$. This was indicating that there was a significant positive relationship between control components of academic hardiness and academic locus of control. The higher the academic locus of control, the higher the academic hardiness. Thus, H_{1a} is supported.

According to Guildford Rule of Thumb, the correlation between academic locus of control and control components of academic hardiness was weak. Guildford (1973) stated that the relationship is considered as weak as *r* value that falls within ±.2 to ±.4 while the relationship is considered as moderate as the *r* value falls within ±.4 to ±.7.

H_{1b}: There is a positive relationship between commitment components of academic hardiness and academic locus of control.

The assumptions of PPMC were observed, including normality of distribution based on Skewness and Kurtosis which can refer to Table 4.3 and random sampling from population. The

Shapiro-Wilk Test for bivariate normality showed p = .108 which was greater than .05. Therefore, the assumptions of PPMC was met.

The results of PPMC showed that, r (94) = .204, p = .018. The direction of the correlation was positive, which means the higher of academic locus of control, the higher of commitment components of academic hardiness among university students in Malaysia. Thus, H_{1b} is supported. The correlation between academic locus of control and commitment components of academic hardiness was weak based on Guildford (1973).

H_{1c}: There is a positive relationship between challenge components of academic hardiness and academic locus of control.

The assumptions of PPMC were observed, including normality of distribution based on Skewness and Kurtosis which can refer to Table 4.3 and random sampling from population. The Shapiro-Wilk Test for bivariate normality showed p <.001 which was lower than .05. However, the normality was determined with skewness, kurtosis, and random sampling from population. Therefore, the assumption of PPMC was met.

The results of PPMC showed that, r(94) = .325, p <.001. The direction of the correlation was positive which means the higher the academic locus of control the higher the challenge components of academic hardiness. Therefore, H_{1c} is supported. The correlation between academic locus of control and challenge components of academic hardiness was weak based on Guildford (1973).

H_{1d}: There is a positive relationship between control components of academic hardiness and tolerance of ambiguity.

The assumptions of PPMC were observed, including normality of distribution based on Skewness and Kurtosis which can refer to Table 4.3 and random sampling from population. The Shapiro-Wilk Test for bivariate normality showed p = .100 which was greater than .05. Therefore, the assumptions of PPMC was met.

The results of PPMC showed that r (94) = .137, p = .082. The direction of the correlation between tolerance of ambiguity and control components of academic hardiness was positive however it is not significant. Therefore, H_{1d} is not supported. The correlation between tolerance of ambiguity and control components of academic hardiness was weak based on Guildford (1973).

H_{1e}: There is a positive relationship between commitment components of academic hardiness and tolerance of ambiguity.

The assumptions of PPMC were observed, including normality of distribution based on Skewness and Kurtosis which can refer to Table 4.3 and random sampling from population. The Shapiro-Wilk Test for bivariate normality showed p = .195 which was greater than .05. Therefore, the assumptions of PPMC was met.

There was no significant relationship between tolerance of ambiguity and commitment components of academic hardiness which the result showed in table 4.4, r (94) = .032, p =.372. Therefore, H1e is not supported. The correlation between tolerance of ambiguity and commitment components of academic hardiness was very weak based on Guildford (1973).

H_{1f}: There is a positive relationship between challenge components of academic hardiness and tolerance of ambiguity.

The assumptions of PPMC were observed, including normality of distribution based on Skewness and Kurtosis which can refer to Table 4.3 and random sampling from population. The Shapiro-Wilk Test for bivariate normality showed p = .246 which was greater than .05. Therefore, the assumptions of PPMC was met.

The results of PPMC based on table 4.4 showed that r (94) = .097, p = 163.There was no significant relationship between tolerance of ambiguity and challenge components of academic hardiness. Therefore, H_{1f} is not supported. The correlation between tolerance of ambiguity and challenge components of academic hardiness was very weak based on Guildford (1973).

H_{1g}: There is a positive relationship between control components of academic hardiness and students' engagement.

The assumptions of PPMC were observed, including normality of distribution based on Skewness and Kurtosis which can refer to Table 4.3 and random sampling from population. The

Shapiro-Wilk Test for bivariate normality showed p = .409 which was greater than .05. Therefore, the assumptions of PPMC was met.

The result of PPMC showed in table 4.4, r (94) = .273, p = .002. There was a significant relationship between students' engagement and control components of academic hardiness. The relationship between these two variables is positive correlated which the higher the students' engagement and the higher control components of academic hardiness. Therefore, H_{1g} is supported. The correlation between students' engagement and control components of academic hardiness was very weak based on Guildford (1973).

H_{1h}: There is a positive relationship between commitment components of academic hardiness and students' engagement.

The assumptions of PPMC were observed, including normality of distribution based on Skewness and Kurtosis which can refer to Table 4.3 and random sampling from population. The Shapiro-Wilk Test for bivariate normality showed p = .117 which was greater than .05. Therefore, the assumptions of PPMC was met.

The result of PPMC showed that r (94) = .446, p < .001. There was a significant relationship between students' engagement and commitment components of academic hardiness. The relationship between these two variables is positive correlated which the higher the students' engagement and the higher commitment components of academic hardiness. Therefore, H_{1h} is supported.

According to Guildford Rule of Thumb, the correlation between students' engagement and commitment components of academic hardiness was moderate. Guildford (1973) stated that the relationship is considered as weak as *r* value that falls within ±.2 to ±.4 while the relationship is considered as moderate as the *r* value falls within ±.4 to ±.7.

H_{1j}: There is a positive relationship between challenge components of academic hardiness and students' engagement.

The assumptions of PPMC were observed, including normality of distribution based on Skewness and Kurtosis which can refer to Table 4.3 and random sampling from population. The Shapiro-Wilk Test for bivariate normality showed $p = .742$ which was greater than .05. Therefore, the assumptions of PPMC was met.

The result of Pearson Product-Moment Correlation showed that, $r\ (94) = .263$, $p = .003$. It showed that there is a significant positive correlated relationship between student's engagement and challenge components of academic hardiness which the higher the student's engagement and the higher the challenge components of academic hardiness. Therefore, H_{1j} is supported. The correlation between students' engagement and challenge components of academic hardiness was very weak based on Guildford (1973).

H_{1j}: There is a negative relationship between control components of academic hardiness and automatic negative thoughts.

The assumptions of PPMC were observed, including normality of distribution based on Skewness and Kurtosis which can refer to Table 4.3 and random sampling from population. The Shapiro-Wilk Test for bivariate normality showed $p < .001$ which was smaller than .05. However, the normality was determined with skewness, kurtosis, and random sampling from population. Therefore, the assumption of PPMC was met.

The Pearson Product-Moment Correlation showed that, r (94) = -.386, p <.001. It revealed that there is a significant but negative correlated relationship between automatic negative thoughts and control components of academic hardiness which the higher the automatic negative thoughts and the lower the control components of academic hardiness. Therefore, H_{1j} is supported. The correlation between control components of academic hardiness and automatic negative thoughts was weak based on Guildford (1973).

H_{1k}: There is a negative relationship between commitment components of academic hardiness and automatic negative thoughts.

The assumptions of PPMC were observed, including normality of distribution based on Skewness and Kurtosis which can refer to Table 4.3 and random sampling from population. The Shapiro-Wilk Test for bivariate normality showed $p = .104$ which was greater than .05. Therefore, the assumption of PPMC was met.

The PPMC result showed, r (94) = -.073, $p = .229$. There was no significant negative relationship between automatic negative thoughts and commitment components of academic

hardiness. Therefore, H_{1k} is not supported. The correlation between commitment components of academic hardiness and automatic negative thoughts was very weak based on Guildford (1973).

H_{1l}: There is a negative relationship between challenge components of academic hardiness and automatic negative thoughts.

The assumptions of PPMC were observed, including normality of distribution based on Skewness and Kurtosis which can refer to Table 4.3 and random sampling from population. The Shapiro-Wilk Test for bivariate normality showed $p < .001$ which was smaller than .05. However, the normality was determined with skewness, kurtosis, and random sampling from population. Therefore, the assumption of PPMC was met.

The results of Pearson Product-Moment Correlation showed that, r (94) = -.343, p <.001. It showed that there was a significant negative relationship between automatic negative thoughts and challenge components of academic hardiness. Therefore, H1l is supported. The correlation between challenge components of academic hardiness and automatic negative thoughts was weak based on Guildford (1973).

Table 4.4
Correlation among Variables (n=94)

Variables	AHS_CON	AHS_COM	AHS_CHA
1. ALOC	.352**	.204*	.325**
2. TA	.137	.032	.097
3. USEI	.273*	.446**	.263*
4. ANT	-.386**	-.073	-.343**

Note. AHS_CON = Control Components of Academic Hardiness; AHS_COM = Commitment Components of Academic Hardiness; AHS_CHA = Challenge Components of Academic Hardiness; ALOC = Academic Locus of Control; TA = Tolerance of Ambiguity; USEI = University Students' Engagement Inventory; ANT = Automatic Negative Thoughts; * Indicates p <.05; ** Indicates p <.01

H_2: There will be a significant prediction of academic hardiness by the academic locus of control, tolerance of ambiguity, student's engagement, and automatic negative thought.

The assumptions of MLR were observed, including linear relationship, no significant outliers, no multicollinearity, independence of observation, and homoscedasticity which can refer to table below. Multiple linear regression was conducted to investigate how well academic locus of control, tolerance of ambiguity, student's engagement, and automatic negative thought predict academic hardiness. Table 4.8 showed that the Durbin-Watson is 1.877 which is between 1.5 and 2.5 that indicating it was an independent observation (Berry, 1993). Table 4.7 also showed that all the collinearity tolerance was more than 0.1 and VIF were not more than 5.0 which indicated that this data was normal and no outlier. Apart from that, there was no multivariate outlier which there is no standard residual that is greater than 3.29 and no cook distance that is greater than 1 through case wise diagnostics.

The results were statistically significant F (4,100) = 18.784, p < .001. The identified equation to understand this relationship was *academic hardiness* = 0.117 (*academic locus of control*) – 0.114 (*tolerance of ambiguity*) + 0.248 (*student's engagement*) – 0.134 (*automatic negative thought*) +33.067. The value of academic hardiness can be obtained using the formula by looking at individual cases. For example, one of the cases scored 73 in academic locus of

control, 39 in tolerance of ambiguity, 47 in student's engagement and 8 in automatic negative thoughts, the equation for academic hardiness = 0.117 (*73*) – 0.114 (*39*) + 0.248 (*47*) – 0.134 (*8*) +33.067. Therefore, academic hardiness for this individual case was 47.746.

It was found that academic locus of control (β = 0.224, p = .015), student's engagement (β = 0.415, p < .001) and automatic negative thoughts (β = -0.184, p = .040) significantly predicted academic hardiness. However, tolerance of ambiguity (β = -0.018, p = .335) was not significantly predicted academic hardiness. The adjusted *R* squared value was 0.330. This indicates that 33.0 % of the variance in academic hardiness was explained by academic locus of control, tolerance of ambiguity, student's engagement, and automatic negative thoughts. According to Cohen (1988), the effect size of f^2= 0.49 was large.

In short, student's engagement was strongest predictor and followed by academic locus of control and automatic negative thoughts. However, tolerance of ambiguity failed to predict academic hardiness. Thus, H_2 was supported.

Table 4.5

Result of Regression Model

	df	*F*	*p*	Adj. R^2	R Square
Regression	4	13.784	.000	.330	.355
Residual	90				
Total	94				

Note. Dependent Variable = Academic Hardiness. Predictors = Academic Locus of Control, Tolerance of Ambiguity, University Students' Engagement, and Automatic Negative Thoughts

Table 4.6

Result of Regression Coefficient

	t	Std. β	Unstd. β	*p*
Academic Locus of Control	2.478	.224	.117	.015
Tolerance of Ambiguity	-.969	-.081	-.114	.335
University Students' Engagement	4.813	.415	.248	.000
Automatic Negative Thoughts	-2.077	-.183	-.134	.040

Note. Dependent Variable = Academic Hardiness

Table 4.7

Collinearity Table of Tolerance and VIF

		Tolerance	VIF
1	(Constant)		
	Academic Locus of Control	.791	1.265
	Tolerance of Ambiguity	.930	1.075
	University Students' Engagement	.867	1.153
	Automatic Negative Thoughts	.826	1.211

Dependent Variable: Academic Hardiness

Table 4.8

Independent Error Test

Model	Durbin-Watson
1	1.877

Note. Dependent Variable = Academic Hardiness. Predictors = Academic Locus of Control, Tolerance of Ambiguity, University Students' Engagement, and Automatic Negative Thoughts

Chapter 5

Discussion and Conclusion

Discussion

The current study was to investigate the relationships between academic hardiness, academic locus of control, tolerance of ambiguity, university students' engagement, and automatic negative thoughts. Besides, this study examined the predictive relationship between academic hardiness, academic locus of control, tolerance of ambiguity, university students' engagement, and automatic negative thoughts.

Academic Locus of Control and Academic Hardiness

The result showed that all the dimension of academic hardiness and academic locus of control had a significant and positive relationship which H_{1a}, H_{1b}, H_{1c} was consistent with other past studies (Abdollahi et al., 2020; Kobasa & Suzanne, 1979; Maddi, 1999; Schultz, 2016). These significant research findings support that people with a high level of internal locus of control are more likely to have a high level of academic hardiness. According to Benishek and Lopez (2001), students with a high level of internal locus of control believed that they have a sense of control over their academic outcomes. For instance, students will blame failure in academics on their failure to study instead of the blame on the difficulty level of examination or unfair teacher. Besides, self-efficacy can be one of the explanations for the academic locus of control. Students with high self-efficacy believe in their capabilities to achieve their academic outcomes or performance through organizing and execute the action related to their goals. Bartone (2013) also stated that students with high self-efficacy have a high academic locus of control which is related to the control components of academic hardiness.

According to Maroˆco et al. (2019), students with a high academic internal locus of control are more likely to have active coping strategies in academics. It helps students to stay engaged with academic activities instead of using maladaptive coping strategies such as avoidance as facing academic difficulties and avoid difficult classes. Adaptive coping style especially positive reframing coping style positively predicted the vigor, dedication, and absorption in an academic setting among university students (Vizoso et al., 2018). It eventually helps university students to stay involved in academic activities while facing academic stress. Therefore, academic locus control was correlated with commitment components of academic hardiness.

Besides, existential courage produced by an internal locus of control also can explain the significant positive relationship between academic internal locus of control and challenge components of academic hardiness. According to Maddi (2004), existential courage can help an individual to tolerate and deal with stressful events. Therefore, University students have the motivation to deal with academic challenges and view the academic difficulties as an opportunity to self-development with existential courage. Hence, the result of the present study proved that University students in Malaysia who have a high academic internal locus of control are more like to have academic hardiness which helps them to overcome academic difficulties such as failure and academic stress (Kamtsios and Evangelia, 2015).

Tolerance of Ambiguity and Academic Hardiness

The result showed that all dimensions of academic hardiness had no significant relationship with tolerance of ambiguity which H_{1d}, H_{1e}, and H_{1f} were not supported by the results of the current study. Although, the result was no consensus with most of the past studies (Atamanova & Bogomaz, 2014; Eidles-Maoz, 2006; Franco et al., 2020; Rezae et al., 2009).

However, there was a cross-sectional study that discovers that hardiness will not directly be influenced by tolerance of ambiguity but influence hardiness indirectly (Kuzikova, 2019). It is also supported by a study conducted by Vindeker et al. (2016) which found that tolerance of ambiguity has not a significant relationship with a high level of hardiness. In the other words, students with a high tolerance of ambiguity do not have high academic hardiness regarding control, commitment, and challenge components. Kuzikova (2019) found out that tolerance of ambiguity was positively correlated with hardiness indirectly with the help of a factor which was the need for self-development. Thus, tolerance of ambiguity might be the moderator or mediator variable for the relationship between the need for self-development and hardiness. This means that tolerance of ambiguity had an indirect effect on hardiness in this relationship. It is due to tolerance of ambiguity can act as an internal resource for self-development that help an individual to handle and accepting the stressful situations and managing their internal emotion and think productively (Kuzikova, 2015). However, there is a lack of studies that explain the insignificant relationship of tolerance of ambiguity with academic hardiness. Therefore, it highlighted the need to have a further investigation of the relationship between tolerance of ambiguity and academic hardiness.

University Students' Engagement and Academic Hardiness

H_{1g}, H_{1h}, and H_{1i} were supported by the findings of the present study. It was consistent with several past studies (Abdollahi et al., 2020; Benishek & Lopez, 2001; Cole et al., 2004; Vizoso et al., 2018). This means a higher level of students' engagement in an academic setting is positively correlated with a high level of academic hardiness. Apart from that, the findings found that students' engagement had the strongest positive significant relationship with commitment components compare to control and challenge components of academic hardiness. It could be

explained by that students' engagement is a variable that has a similar theoretical construct with commitment components of academic hardiness (Benishek & Lopez, 2001). It is due to university students with high academic engagement tend to stay active and involve with academic activities even though they faced challenges or difficulties. Therefore, it highly correlated with commitment components of academic hardiness.

Moreover, students' engagement can be studied in cognitive, emotional, and behavioral dimensions (Fredricks et al., 2014). A student with high academic engagement in terms of cognitive engagement will lead students to have higher willingness and openness for students to learn and struggle with complex and challenging academic ideas and skills (Maroco et al., 2016). Thus, students with academic engagement result in correlating with challenge components of academic hardiness.

Hughes and Chen's (2011) finding can be one of the explanations that students' engagement was positively correlated with control components of academic hardiness. They found that student engagement can act as a factor that increases student's academic self-efficacy which establish a sense of control and belief in their capabilities to give an impact on their academic achievement and performance. It was supported by Abdollahi and Noltemeyer (2018) that students with high student engagement indicated they highly involved in good interpersonal relationships with their teacher. The teacher can act as one of the protective factors that promote students to believe they can have a positive impact on their academic outcome as they faced academic challenges through praise (Pajares, 2008). Therefore, university students in Malaysia with high academic engagement will result in high academic hardiness.

Automatic Negative Thoughts and Academic Hardiness

The findings of the present study revealed that automatic negative thoughts were negatively correlated with control components and challenge components of academic hardiness which supported H_{1j} and H_{1l}. University students with high automatic negative thoughts will have low academic hardiness regarding control and challenge components. This means university students with higher automatic negative thoughts will no believe in their capabilities to determine their academic outcomes as they faced academic difficulties. Besides, they may have low openness toward complex and comprehension courses or academic ideas which may lead them to avoid the class or high attrition rate in university (Maddi et al, 2002). This result also supported by several past studies (Jafar et al., 2015; Nowack, 1989; Zhang & Wong, 2011) supported that academic negative thoughts were negatively related to control and challenge components of academic hardiness. According to Mentese et al. (2018), automatic negative thoughts such as 'Those who make mistakes deserve blame.' and 'I'm not afraid of doing things I cannot do well.' have a negative influence on students' sense of control which leads them low in control components of hardiness. Therefore, students with high automatic negative thoughts are more likely to find excuses for their academic failure and believed that they have no power and capabilities to manipulate their academic outcomes. Apart from that, automatic negative thoughts produced by cognitive distortions such as labeling and emotional reasoning will cause students to avoid difficult courses and use maladaptive coping skills such as avoidance to deal with the stress and academic difficulties (Strohmeier et al., 2016).

However, the findings also revealed that there was no significant relationship between automatic negative thoughts and commitment components of academic hardiness which H_{1k} was not supported. This is also supported by a study conducted by Edgar et al., (2011). In their study,

they claimed that automatic negative thoughts had no direct relationship with academic engagement. However, automatic negative thoughts have a mediating effect on the relationship between self-efficacy and academic engagement. This means by decreasing automatic negative thoughts will lead to an increase in self-efficacy which enhances engagement. According to Jafar et al., (2016), the capabilities of students, for instance, taking challenges assignments, having presentations, committed in classes as well as their level of self-efficacy can be strengthened by reducing their automatic negative thoughts about themselves. In short, the present findings found that automatic negative thoughts had a significant relationship with cognitive and emotional components of hardiness which are control and challenge components of hardiness.

Predictors of Academic Hardiness

Based on the finding in this study, academic internal locus of control can predict academic hardiness which supported H_2 of the present study. This means students who have a higher academic internal locus of control will contribute positively to academic hardiness. This finding was supported by the result and past studies (Bilibani et al., 2020; Dehghani & Kajbaf, 2013; Maddi 2004). This could be explained by that students with a high academic internal locus of control will have adaptive coping strategies which were supported by a study conducted by Heffer and Willoughby (2017). The adaptive coping strategies such as active coping help students to cope with stress and increase their capabilities to solve academic problems will lead to high academic hardiness. On the contrary, students with a low internal locus of control will have maladaptive coping strategies which will increase their stress and self-harm behavior and lead to low academic hardiness. This is also consistent with the findings of Besharat (2007) that coping styles had reciprocal predictive relationships with hardiness. Thus, there is a predictive relationship between academic internal locus of control and academic hardiness.

Tolerance of ambiguity was found could not predict academic hardiness based on the present findings which were failed to support H_2. Although, this result was consensus with the Vindeker et al. (2016) study that tolerance of ambiguity had no predictive relationship with academic hardiness. However, the present finding was not congruent with most of the findings in the literature which found that tolerance of ambiguity could predict academic hardiness (Abdellatif & Abdel-Gawad, 2020; Merino-Tejedor et al., 2015; Zhang & Sternberg, 2005). This could be explained by a study conducted by Mohamed and Mervat (2020). They stated that tolerance of ambiguity is one of the components of higher-order thinking skills that will positively correlated with hardiness. Higher-order thinking skills can help people to regulate their emotions and managing their stress with adaptive skills which positively impact hardiness. However, there are other components that build up to higher-order thinking skills for instance creative thinking, critical imagination, thoughtful risk, and cognitive flexibility. This means it is not sufficient to predict academic hardiness with only tolerance of ambiguity. Apart from that, it was also supported by a study conducted by Kuzikova (2019) that there was no direct and significant relationship between tolerance of ambiguity and academic hardiness. There might be mediator among the relationship between tolerance of ambiguity and academic hardiness. Therefore, increasing students' tolerance of ambiguity will not contribute positively to their academic hardiness.

According to the findings of the present study, university students' engagement predicts academic hardiness positively which supported H_2 successfully. Moreover, university students' engagement was the best predictor that had a score of 0.415 standardized coefficients Beta which was the highest among all the variables according to the present findings. This finding was consistent with the past studies (Adollahi et al., 2020; Ayala & Manzano, 2018; Benishek &

Lopez,2001; Kuo et al., 2017) which found that students' engagement was a significant predictor of academic hardiness. This could be explained by that person who has a high level of academic engagement are more likely to engage and devote themselves in academic even they faced academic challenges. It is due to students who committed to academics tend to achieve a sense of belonging with school, teachers, and friends. According to Abdollahi et al. (2020), students being motivated to take challenging courses, adopt adaptive coping strategies to deal with academic stress, and view academic difficulties as a chance for self-development with a sense of belongingness. Therefore, students with a high level of academic engagement are more like to contribute positively to academic hardiness.

Automatic negative thoughts predict academic hardiness negatively which supported H_2 according to the present findings. This result was consensus with several past studies (Jafar et al., 2016; Kobasa & Maddi, 2001; Thompson, 2017). This can be explained by automatic negative thoughts block students to deal with academic stress and academic problems rationally. Besides, Khaledian et al. (2016) found that irrational belief which was the foundation of automatic negative thoughts were positively related to maladaptive solving skills and negatively related to adaptive problem-solving skills. Thus, students will fail to deal with academic stress and academic problem which might lead to disengagement with school, assignments, and interpersonal relationships with the teacher or other students which does not positively contribute to the commitment component of academic hardiness. Moreover, one of the maladaptive coping strategies is avoidance which will negatively contribute to challenge components of academic hardiness. It is due to students will use avoidance to deal with difficult courses or assignments which was the opposite of the challenge component of hardiness that students are more likely to be highly open to academic challenges and view academic challenges as self-improvement.

Lastly, automatic negative thoughts will negatively contribute to the internal locus of control according to Khaledian et al. (2016). It is due to the fact the automatic negative thoughts which are related to catastrophic thinking or labeling will not cause an individual to believe that they have no control over their life. Therefore, it is negatively contributing to control components of academic hardiness. Hence, decreasing university students' automatic negative thoughts will increasing their level of academic hardiness.

Implication

Theoretical Implications

Findings of the current study had contributed to the hardiness theory which specified in an academic setting among university students in Malaysia in relation to variables such as academic locus of control, tolerance of ambiguity, university students' engagement, and automatic negative thoughts. The current study utilizes the theory of hardiness (Benishek, 2005; Kobasa,1979) which aimed to investigate the significant variables that can contribute to hardiness. Based on the findings, academic locus of control and university students' engagement had a significant relationship with academic hardiness and predicted academic hardiness positively. Moreover, university students' engagement was found to be the best predictor of academic hardiness. Thus, the result and analysis of the current study consolidated hardiness theory which showed that this theory remains its reliability and validity for future study in the Malaysian context.

However, the current result shed a light on the relationship between the variable of tolerance of ambiguity toward the challenge component of academic hardiness. The current study found that there was no significant relationship between tolerance of ambiguity and

challenge components of academic hardiness which was no consensus with most of the past studies (Rezae et al., 2009; Galazhinskiy & Krasnoryadtseva, 2013; Vindeker et al., 2016; Ayala & Gracia, 2017; Kobasa, 1982). This showed that tolerance of ambiguity might not theoretically consistent with challenge components of hardiness which might not be able to contribute positively to hardiness. It can be concluded that although tolerance of ambiguity might not be able to contribute directly to academic hardiness, however, an indirect effect exists between them (Kuzikova, 2015). This means the present result suggests that the relationship between tolerance of ambiguity and hardiness might not inconclusive. Thus, the inconclusive highlight the need to have further studies to examine the relationship between tolerance of ambiguity and academic hardiness.

Other than that, the current study found that cognitive factors for instance automatic negative thoughts were significant to hardiness. Automatic negative thoughts were found to have a significant relationship and predicted hardiness negatively. This was consistent with Warren and Hale (2020) that cognitive factors such as automatic negative thoughts and rational belief had a significant effect on non-cognitive factors for instance hardiness and grit. This result affirmed the past studies (Jafar et al., 2016; Kobasa & Maddi, 2001; Thompson, 2017) that cognitive factors especially automatic negative thoughts can predict academic hardiness negatively. This means the level of students' academic hardiness can be increased by decreasing their automatic negative thoughts. Thus, the present study suggested that future research should address or consider cognitive factors which are not included in hardiness theory such as automatic negative thoughts to reach a more comprehensive understanding.

Practical Implication

The present study provides a practical framework for university students to recognize the significant factors that are influencing their academic hardiness. This means the study benefits the students to increase their capabilities to deal with academic stress, view academic challenges positively as an opportunity to self-growth, and maintain the engagement with the university, assignment, and the relationship with a lecturer or another student by increasing their academic locus of control and academic engagement. Apart from that, the mental health and well-being of university students can be ensured as they are able to manage their academic stress and academic challenges effectively and positively. By doing so, the academic performance of the university students will be improving which was beneficial to the university and the students themselves.

Moreover, this study benefits counselors especially university counselors to deal with university students who are at having a high risk of dropping out and high academic stress. First, the result showed that academic locus of control and academic engagement is important to increase hardiness which helps to decrease the risk of drop out, burn out and level of academic stress (Hasty et al., 2009; Kamtsios & Evangelia, 2015; Minjoeng et al., 2017). A counselor could assist university students to develop their academic locus of control and overcome the resistance of academic engagement to increase their academic hardiness. Apart from that, this study discovered that automatic negative thoughts were negatively correlated and predicted academic hardiness. A counselor can apply cognitive behavioral therapy to students who are low in academic hardiness. It is due to cognitive behavioral therapy aimed to assist an individual to recognize and restructure his automatic negative thoughts. Therefore, counselors can help those students with a high risk of drop out and a high level of academic stress by assisting them to decrease their automatic negative thoughts to contribute positively to their academic hardiness. By doing so, university counselor can benefit their institution or organization by preventing the

students drop out and increase the academic attrition rate of the students. As a result, the revenue and image of the educational institution or organization can be maintained positively.

Limitations of Study

One of the limitations of the present study is the research design of this study. According to Solem (2015), there was a lack of evidence to support the temporal relationship between exposure and outcome because it was assessed at one time. Therefore, the causal relationship between the predictors and academic hardiness might not be accurate over time in this present study. Moreover, Maddi (1997) stated that hardiness was not innate which could be developed through training and experiences across years. Thus, the current result might able be interpreted through cross-sectional study, but except for the pattern of changes in academic hardiness over time.

Besides, a total of 81 questions in the present survey questionnaire might influence the accuracy of the results. It might cause participants to answer all the questions for the sake of completing the survey because of the time-consuming. This means a lengthy survey questionnaire might affect the patience and interest of participants to answer the questionnaire. One of the instruments used in the present study which was the academic locus of control scale consists of 28 questions that might be problematic to participants.

Apart from that, one of the limitations is the sampling method adopted in the present study. The present study adopted the purposive sampling method due to researcher had limited resources, time, and workforce during the Covid-19 pandemic. However, the requirement of standard operating procedure (SOP) in Malaysia was fulfilled as conducting data collection during the Covid-19 pandemic. According to Etikan et al. (2016), there was existence of

limitations as adopting nonprobability sampling methods for instance purposive sampling. The major weakness of the purposive sampling method is unable to represent the population due to its subjective nature in selecting the sample during the recruiting process. Therefore, a weak generalization of the findings and unpredicted bias might occur in the present study.

Lastly, all the questionnaire and instrument that used in the present study are self-reported online questionnaires which might lead to response bias. According to Rosenman et al. (2011), the reliability and validity of the self-reported data might be challenged due to the response biased caused by social-desirability bias. This means participants' answers might be affected by the social expectation which they wanted to 'have good-looking result' in the survey. For instance, one of the questions in the automatic negative thought questionnaire was measuring how frequently participants have thought about 'I'm no good' in the present study. There might be some of the participants may think that this thought represents a 'loser or weak person'. As a result, they might not answer the actual response.

Recommendations for Future Research

First, future research is suggested to adopt a longitudinal study design to institute a valid cause and effect relationship between academic hardiness and other variables (Solem, 2015). According to Maddi (2002), one of the nature of hardiness is it is not innate which means that an individual can increase their hardiness through training or experiences across years. This means there is a need to examine the development of academic hardiness within a duration of time. According to Sedgwick (2014), the same participants are required to take the same measurement at different points in time which assists researchers able to observe the differences of the participants in longitudinal study design.

Secondly, one of the recommendation is to further explore other cognitive factors for instance irrational belief and cognitive distortion based on academic hardiness. Although, the present study found that automatic negative thought can predict academic hardiness negatively. However, there are other cognitive factors that might have better predictive power on academic hardiness compare to automatic negative thought. Besides, there are lack of study that focus on the predictive relationship between cognitive factors and academic hardiness in Malaysia context. Thus, it might be beneficial to university students and counsellors on dealing with issues that related to low academic hardiness.

The last recommendation is to increase the reliability and validity of the results by increasing the sample size. One of the important factors that affect the reliability of the data is the sample size (Faber & Fonseca, 2014). It might be due to some of the data might be affected by social expectation as the participants answering the questions. The current study had a medium effect size with a total of 94 sample excluded the outliers and invalid samples. However, the present sampling method might affect the ability to generalize the data to university student in Malaysia. Therefore, future researcher might consider increasing the sample size as the chosen population is large.

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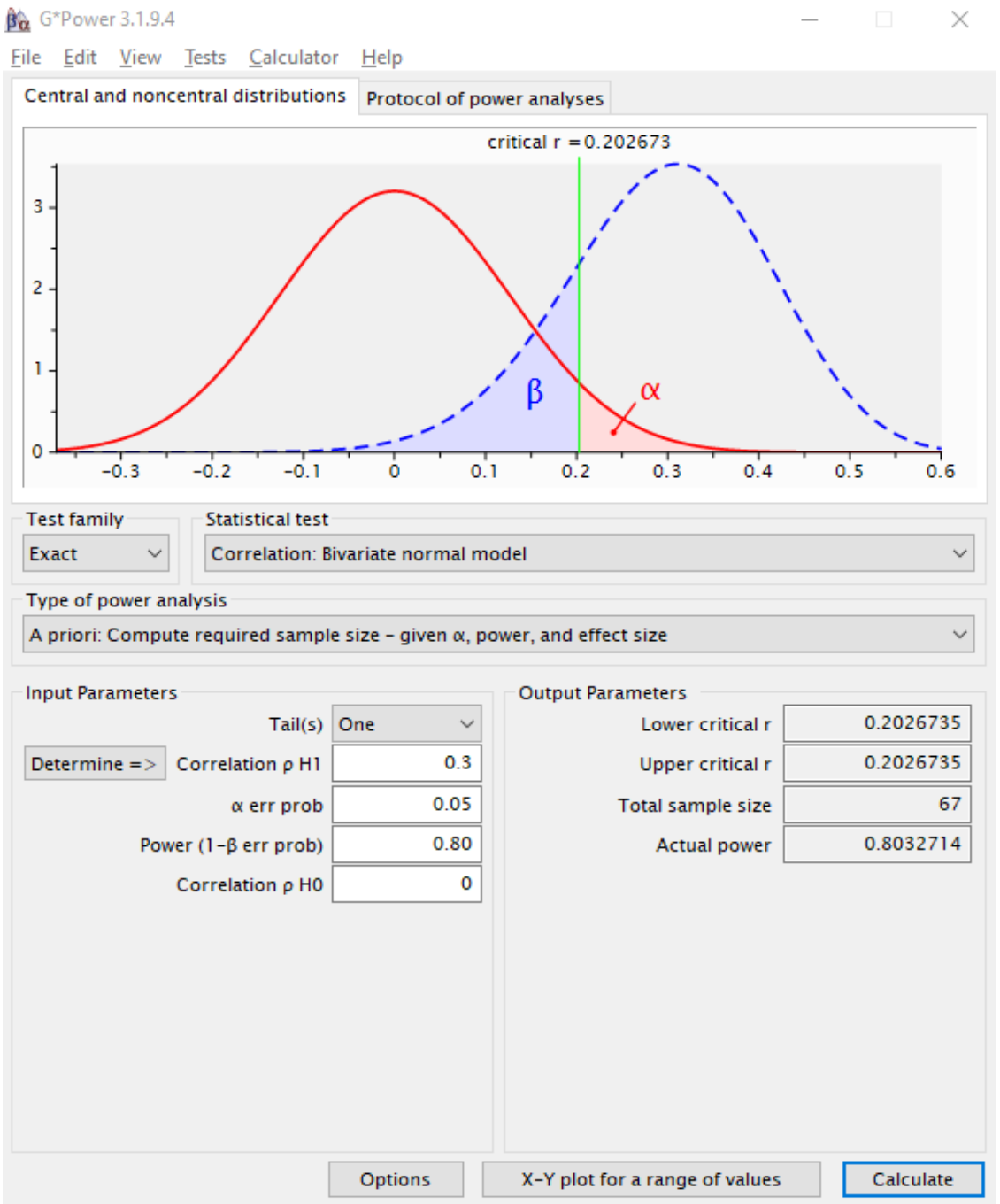
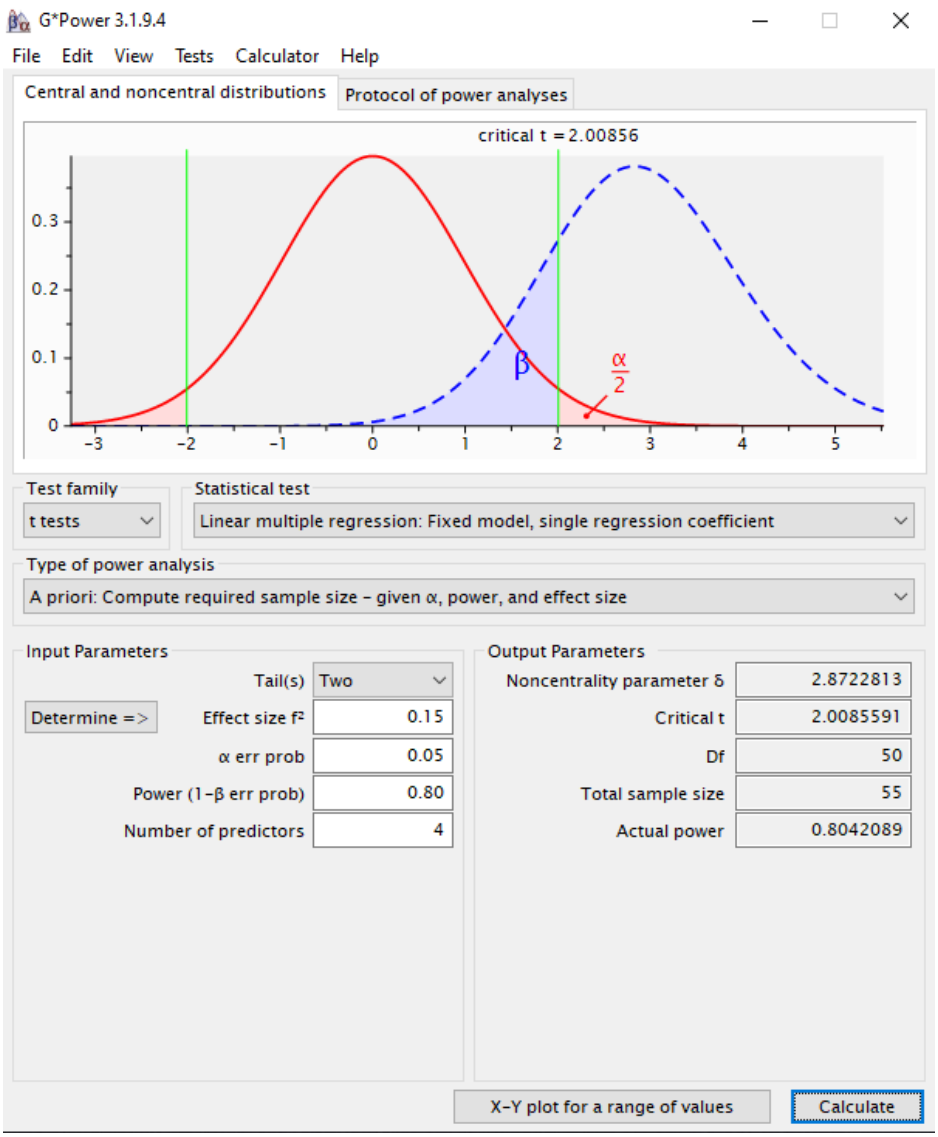
Appendices

Appendix A

Sample Size Calculation




G*Power 3.1.9.4
File Edit View Tests Calculator Help
Central and noncentral distributions
Protocol of power analyses
critical t = 2.00856
0.3
0.2
0.1
0
−3 −2 −1 0 1 2 3 4 5
β
α/2
Test family
t tests
Statistical test
Linear multiple regression: Fixed model, single regression coefficient
Type of power analysis
A priori: Compute required sample size – given α, power, and effect size
Input Parameters
Tail(s) Two
Determine =>
Effect size f²
0.15
α err prob
0.05
Power (1−β err prob)
0.80
Number of predictors
4
Output Parameters
Noncentrality parameter δ
2.8722813
Critical t
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Df
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Total sample size
55
Actual power
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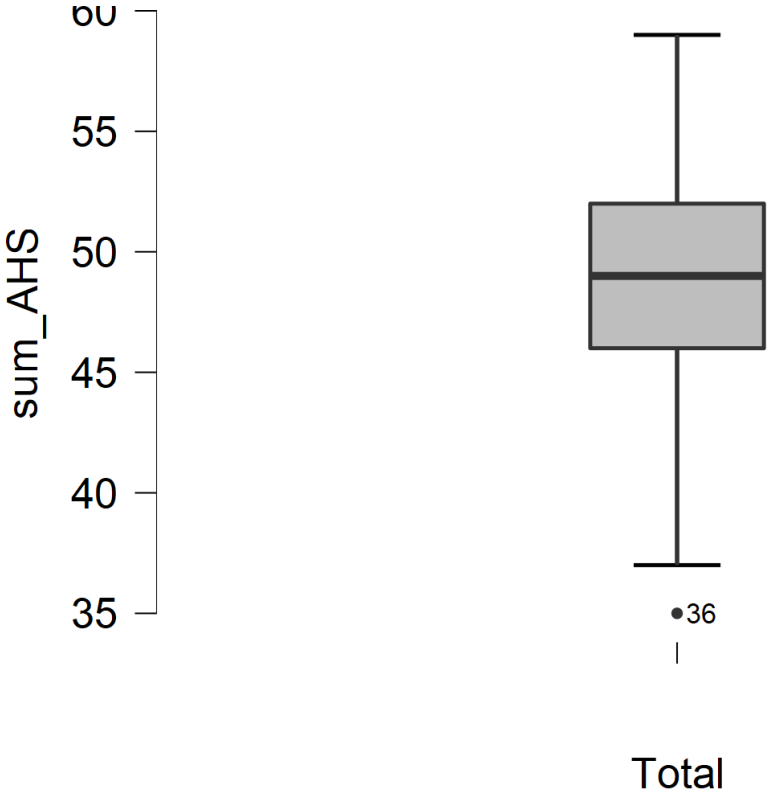
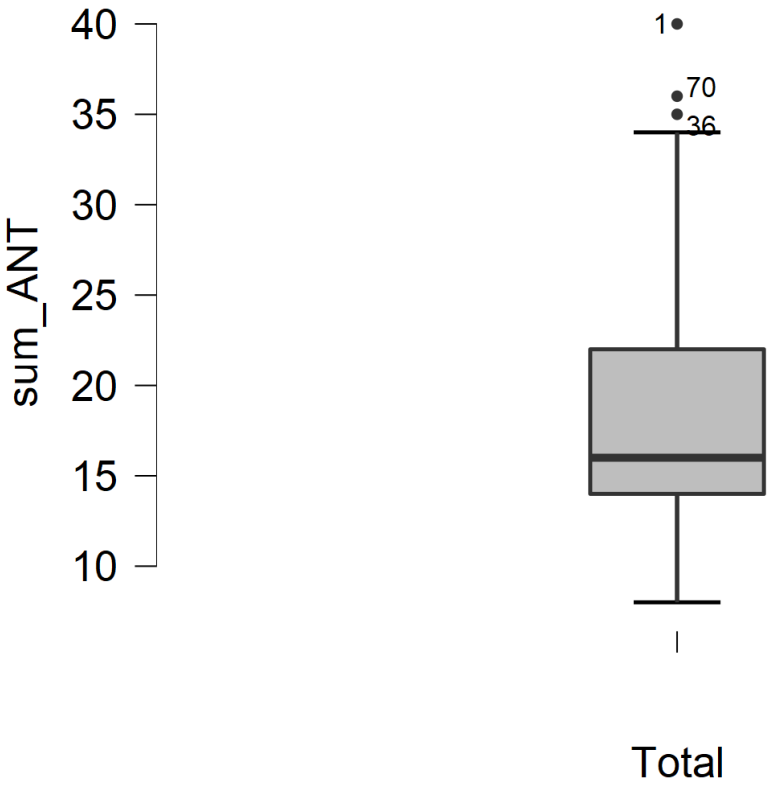
X-Y plot for a range of values
Calculate

Appendix B

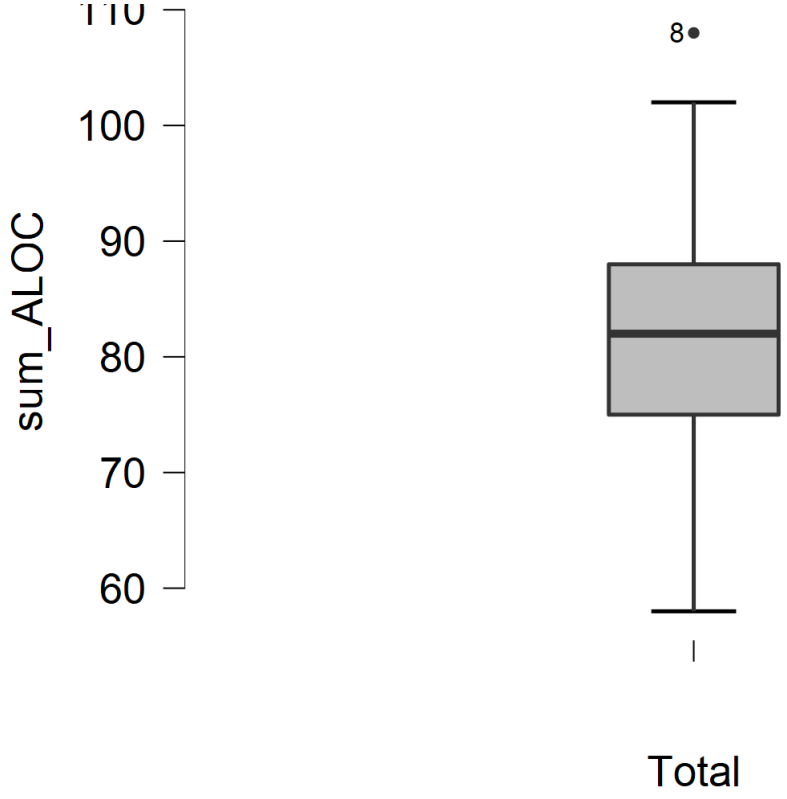
Boxplot for Each Distributions with Outliers



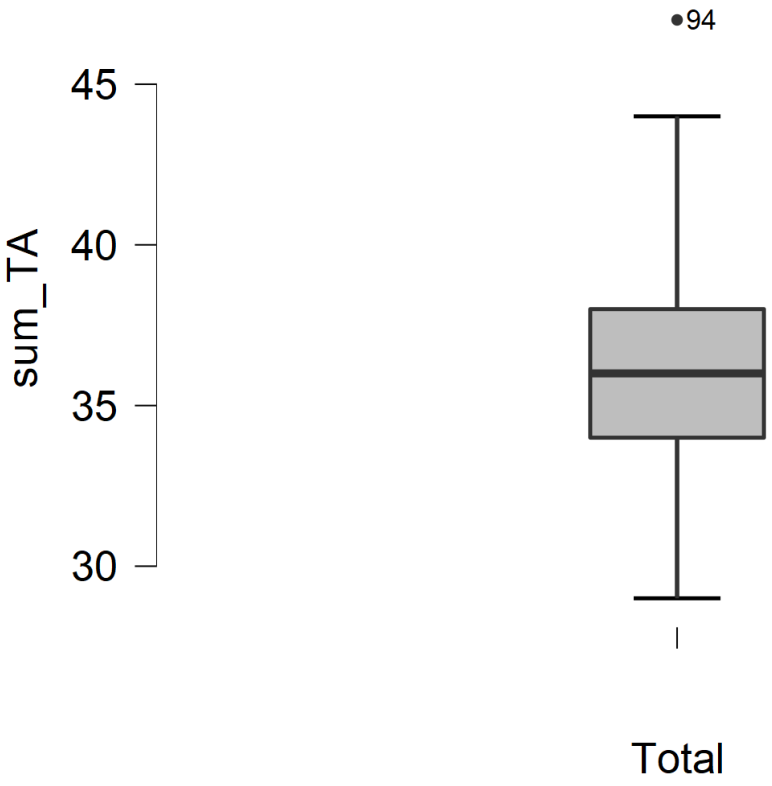
Automatic Negative Thought



Academic Locus of Control



Tolerance of Ambiguity



University Students' Engagement Inventory

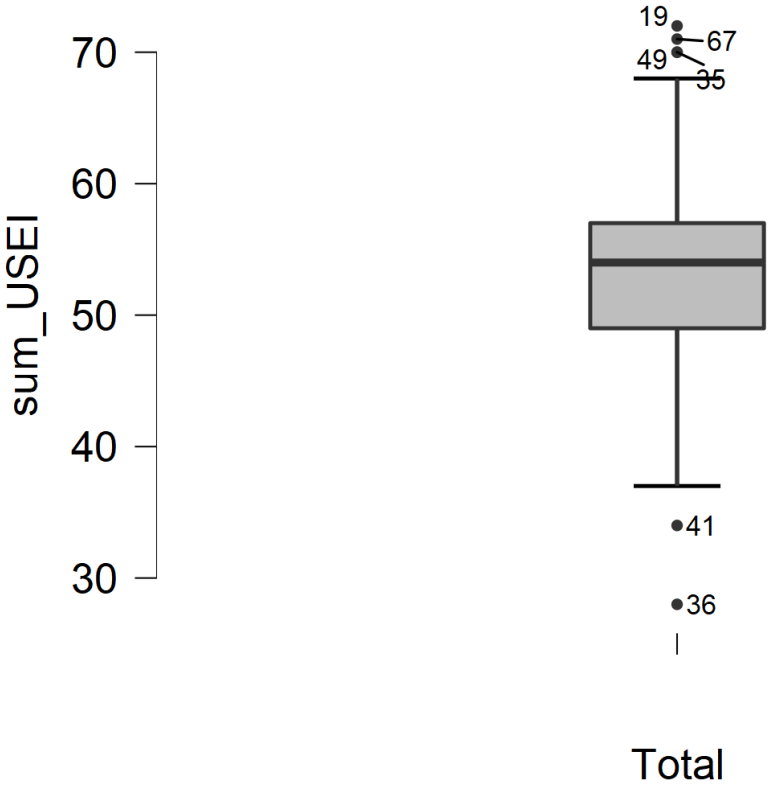
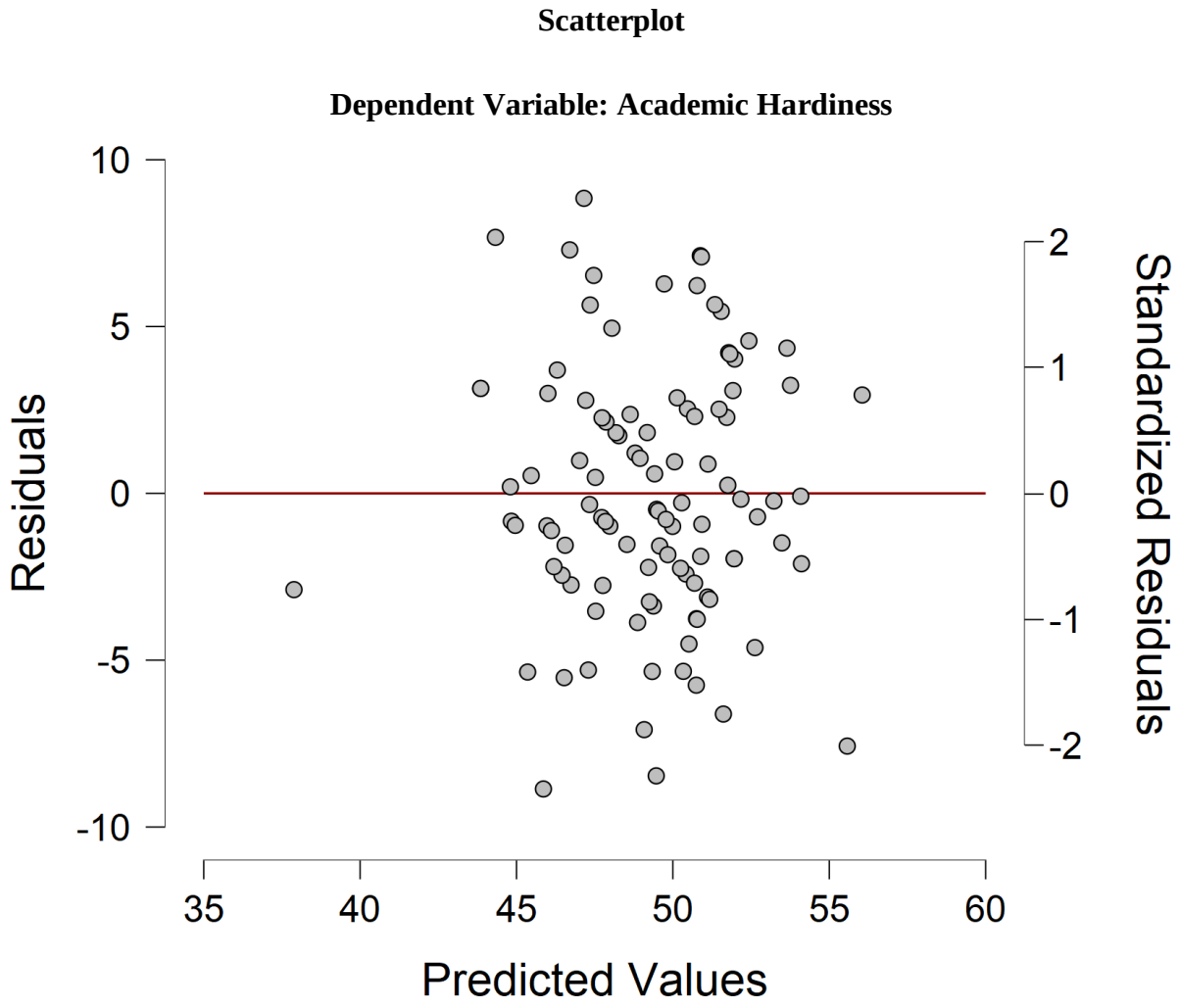


Figure 4.1

Scatterplot of Assumptions for Linearity, Residual Normality, and Homoscedasticity.



Appendix C

JASP 0.12.2.0 Output for Pearson's Correlation

Pearson's Correlations

Variable		sum_ALOC	sum_AHS_cont	sum_AHS_com	sum_AHS_chall
1. sum_ALOC	Pearson's r	—			
	p-value	—			
2. sum_AHS_cont	Pearson's r	0.354	—		
	p-value	< .001	—		
3. sum_AHS_com	Pearson's r	0.204	0.144	—	
	p-value	0.018	0.071	—	
4. sum_AHS_chall	Pearson's r	0.325	0.440	-0.085	—
	p-value	< .001	< .001	0.807	—

Note. All tests one-tailed, for positive correlation

Shapiro-Wilk Test for Multivariate Normality

Shapiro-Wilk	p
0.917	< .001

Shapiro-Wilk Test for Bivariate Normality

		Shapiro-Wilk	p
sum_ALOC	- sum_AHS_cont	0.978	0.085
sum_ALOC	- sum_AHS_com	0.980	0.108
sum_ALOC	- sum_AHS_chall	0.920	< .001
sum_AHS_cont	- sum_AHS_com	0.987	0.422
sum_AHS_cont	- sum_AHS_chall	0.987	0.424
sum_AHS_com	- sum_AHS_chall	0.986	0.312

Pearson's Correlations

Variable		sum_TA	sum_AHS_com	sum_AHS_cont	sum_AHS_chall
1. sum_TA	Pearson's r	—			
	p-value	—			
2. sum_AHS_com	Pearson's r	0.032	—		
	p-value	0.372	—		
3. sum_AHS_cont	Pearson's r	0.137	0.144	—	
	p-value	0.082	0.071	—	
4. sum_AHS_chall	Pearson's r	0.097	-0.085	0.440	—
	p-value	0.163	0.807	< .001	—

Note. All tests one-tailed, for positive correlation

Shapiro-Wilk Test for Multivariate Normality

Shapiro-Wilk	p
0.977	0.070

Shapiro-Wilk Test for Bivariate Normality

		Shapiro-Wilk	p
sum_TA	- sum_AHS_com	0.983	0.195
sum_TA	- sum_AHS_cont	0.979	0.100
sum_TA	- sum_AHS_chall	0.984	0.246
sum_AHS_com	- sum_AHS_cont	0.987	0.422
sum_AHS_com	- sum_AHS_chall	0.986	0.312
sum_AHS_cont	- sum_AHS_chall	0.987	0.424

Pearson's Correlations

Variable		sum_AHS_com	sum_AHS_cont	sum_AHS_chall	sum_ANT
1. sum_AHS_com	Pearson's r	—			
	p-value	—			
2. sum_AHS_cont	Pearson's r	0.144	—		
	p-value	0.929	—		
3. sum_AHS_chall	Pearson's r	-0.085	0.440	—	
	p-value	0.193	1.000	—	
4. sum_ANT	Pearson's r	-0.073	-0.386	-0.343	—
	p-value	0.229	< .001	< .001	—

Note. All tests one-tailed, for negative correlation

Shapiro-Wilk Test for Multivariate Normality

Shapiro-Wilk	p
0.975	0.048

Shapiro-Wilk Test for Bivariate Normality

		Shapiro-Wilk	p
sum_AHS_com	- sum_AHS_cont	0.987	0.422
sum_AHS_com	- sum_AHS_chall	0.986	0.312
sum_AHS_com	- sum_ANT	0.980	0.104
sum_AHS_cont	- sum_AHS_chall	0.987	0.424
sum_AHS_cont	- sum_ANT	0.929	< .001
sum_AHS_chall	- sum_ANT	0.939	< .001

Pearson's Correlations

Variable		sum_AHS_com	sum_AHS_cont	sum_AHS_chall	sum_USEI
1. sum_AHS_com	Pearson's r	—			
	p-value	—			
2. sum_AHS_cont	Pearson's r	0.144	—		
	p-value	0.929	—		
3. sum_AHS_chall	Pearson's r	-0.085	0.440	—	
	p-value	0.193	1.000	—	
4. sum_USEI	Pearson's r	0.446	0.273	0.263	—
	p-value	1.000	0.998	0.997	—

Note. All tests one-tailed, for negative correlation

Shapiro-Wilk Test for Multivariate Normality

Shapiro-Wilk	p
0.977	0.066

Shapiro-Wilk Test for Bivariate Normality

		Shapiro-Wilk	p
sum_AHS_com	- sum_AHS_cont	0.987	0.422
sum_AHS_com	- sum_AHS_chall	0.986	0.312
sum_AHS_com	- sum_USEI	0.980	0.117
sum_AHS_cont	- sum_AHS_chall	0.987	0.424
sum_AHS_cont	- sum_USEI	0.987	0.409
sum_AHS_chall	- sum_USEI	0.991	0.742

Appendix D

JASP 0.12.2.0 Output for Multiple Linear Regression

Model Summary - sum_AHS

Model	R	R^2	Adjusted R^2	RMSE	R^2 Change	F Change	df1	df2	p	Durbin-Watson Autocorrelation	Durbin-Watson Statistic	Durbin-Watson p
H_0	0.000	0.000	0.000	4.702	0.000		0	94		0.107	1.783	0.262
H_1	0.596	0.355	0.330	3.850	0.355	13.784	4	90	< .001	0.060	1.877	0.517

ANOVA

Model		Sum of Squares	df	Mean Square	F	p
H_1	Regression	817.087	4	204.272	13.784	< .001
	Residual	1481.903	90	14.819		
	Total	2298.990	94			

Note. The intercept model is omitted, as no meaningful information can be shown.

Coefficients

Model		Unstandardized	Standard Error	Standardized	t	p	Collinearity Statistics Tolerance	Collinearity Statistics VIF
H_0	(Intercept)	49.276	0.459		107.394	< .001		
H_1	(Intercept)	33.067	5.990		5.521	< .001		
	sum_ALOC	0.117	0.047	0.224	2.478	0.015	0.791	1.265
	sum_ANT	-0.134	0.065	-0.183	-2.077	0.040	0.826	1.211
	sum_TA	-0.114	0.118	-0.081	-0.969	0.335	0.930	1.075
	sum_USEI	0.248	0.052	0.415	4.813	< .001	0.867	1.153

Collinearity Diagnostics

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions (Intercept)	sum_ALOC	sum_ANT	sum_TA	sum_USEI
H_1	1	4.869	1.000	0.000	0.000	0.004	0.000	0.001

Collinearity Diagnostics

Model	Dimension	Eigenvalue	Condition Index	Variance Proportions				
				(Intercept)	sum_ALOC	sum_ANT	sum_TA	sum_USEI
	2	0.107	6.759	0.001	0.007	0.688	0.002	0.013
	3	0.014	18.946	0.019	0.089	0.019	0.045	0.982
	4	0.008	24.460	0.003	0.546	0.062	0.485	0.002
	5	0.003	41.282	0.978	0.357	0.227	0.468	0.002

Note. The intercept model is omitted, as no meaningful information can be shown.

Casewise Diagnostics

Case Number	Std. Residual	sum_AHS	Predicted Value	Residual	Cook's Distance
.	.	.	.	.	.

Action Plan of UAPC3093 Project Paper II

Supervisee Dexter Tan Chi Eng

Supervisor Daniel Ho Khee Hoong

Task Description	Date	Supervisee's Signature	Supervisor's Signature	Supervisor's Remarks	Next Appointment Date/Time
Methodology Submit Chapter 3: Methodology Amend Chapter 3: Methodology	25/2/2021		Daniel Ho	Checking the instrument reliability of pilot and actual study	10/3/2021
Results & Findings Submit Chapter 4: Results Amend Chapter 4: Results	10/3/2021		Daniel Ho	Hypothesis result writing	
Discussion & Conclusion Submit Chapter 5: Discussion Amend Chapter 5: Discussion					
Abstract	11/4/2021				
Turnitin Submission	11/4/2021			Generate similarity rate from Turnitin.com	
Amendment					
Submission of final draft	19/4/2021			Submission of hardcopy and documents	
Oral Presentation	20/4/2021				

Notes:
1. Deadline for submission cannot be changed, mark deduction is as per faculty standard.
2. Supervisees are to take the active role to make appointments with their supervisors.
3. Both supervisors and supervisees should keep a copy of this action plan.
4. This Action Plan should be attached as an appendix in Project Paper 2.

Universiti Tunku Abdul Rahman			
Form Title : Supervisor's Comments on Originality Report Generated by Turnitin for Submission of Final Year Project Report (for Undergraduate Programmes)			
Form Number: FM-IAD-005	Rev No.: 0	Effective Date: 01/10/2013	Page No.: 1of 1

FACULTY OF ART AND SOCIAL SCIENCE

Full Name(s) of Candidate(s)	Dexter Tan Chi Eng
ID Number(s)	1806778
Programme / Course	BACHELOR OF SOCIAL SCIENCE (HONS) GUIDANCE AND COUNSELLING
Title of Final Year Project	Academic Hardiness among Malaysian University Students: Academic Hardiness, Academic Locus of control, Tolerance of Ambiguity, Students' Engagement and Automatic Negative Thoughts.

Similarity	**Supervisor's Comments (Compulsory if parameters of originality exceeds the limits approved by UTAR)**
Overall similarity index: 5% **Similarity by source** Internet Sources: 2% Publications: 4% Student Papers: 1%	
Number of individual sources listed of more than 3% similarity: 0	

Parameters of originality required and limits approved by UTAR are as follows:

(i) Overall similarity index is 20% and below, and

(ii) Matching of individual sources listed must be less than 3% each, and

(iii) Matching texts in continuous block must not exceed 8 words

Note: Parameters (i) – (ii) shall exclude quotes, bibliography and text matches which are less than 8 words.

Note Supervisor/Candidate(s) is/are required to provide softcopy of full set of the originality report to Faculty/Institute

Based on the above results, I hereby declare that I am satisfied with the originality of the Final Year Project Report submitted by my student(s) as named above.

Daniel Ho

Signature of Supervisor	Signature of Co-Supervisor
Name: Ho Khee Hoong	Name:
Date: 16 Apr 2021	Date:

FYP2

ORIGINALITY REPORT

5%	2%	4%	1%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	AKIN, Ahmet. "Achievement goals and academic locus of control: Structural equation modeling", Anı Yayıncılık, 2010. Publication	1%
2	Kıvanç Uzun, Zeynep Karataş. "Predictors of Academic Self Efficacy: Intolerance of Uncertainty, Positive Beliefs about Worry and Academic Locus of Control", International Education Studies, 2020 Publication	1%
3	www.sciencepub.net Internet Source	1%
4	Süleyman Can, Erdil Durukan. "Determination of the level of pedagogical formation students' academic locus of control", International Journal of Evaluation and Research in Education (IJERE), 2019 Publication	<1%
5	www.krepublishers.com Internet Source	<1%

6	Submitted to Far Eastern University Student Paper	<1%
7	Jacqueline M Piccinato, Janet N Rosenbaum. "Caregiver Hardiness Explored Within Watson's Theory of Human Caring in Nursing", Journal of Gerontological Nursing, 1997 Publication	<1%
8	www.hindawi.com Internet Source	<1%
9	research.library.kutztown.edu Internet Source	<1%
10	Submitted to British Institute of Technology and E-commerce Student Paper	<1%
11	Danice L. Brown, Christopher B. Rosnick, Daniel J. Segrist. "Internalized Racial Oppression and Higher Education Values", Journal of Black Psychology, 2016 Publication	<1%
12	Submitted to uvt Student Paper	<1%
13	profdoc.um.ac.ir Internet Source	<1%
14	Submitted to University of Bedfordshire Student Paper	<1%

15	link.springer.com Internet Source	<1%
16	Carmen Vizoso, Celestino Rodríguez, Olga Arias-Gundín. "Coping, academic engagement and performance in university students", Higher Education Research & Development, 2018 Publication	<1%
17	afterschool.my Internet Source	<1%
18	Anis Triki, Shane Nicholls, Matt Wegener, Darlene Bay, Gail Lynn Cook. "Anti-Intellectualism, Tolerance for Ambiguity and Locus of Control: Impact on Performance in Accounting Education", Emerald, 2012 Publication	<1%
19	Z. Luo. "The Role of Cis-Regulatory Motifs and Genetical Control of Expression in the Divergence of Yeast Duplicate Genes", Molecular Biology and Evolution, 08/16/2007 Publication	<1%
20	www.mdpi.com Internet Source	<1%

Exclude quotes	On	Exclude matches	Off
Exclude bibliography	On		

UNIVERSITI TUNKU ABDUL RAHMAN
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Re: U/SERC/209/2020

22 December 2020

Dr Chie Qiu Ting
Head, Department of Psychology and Counselling
Faculty of Arts and Social Science
Universiti Tunku Abdul Rahman
Jalan Universiti, Bandar Baru Barat
31900 Kampar, Perak.

Dear Dr Chie,

Ethical Approval For Research Project/Protocol

We refer to the application for ethical approval for your students' research projects from Bachelor of Social Science (Hons) Guidance and Counselling programme enrolled in course UAPC3083/ UAPC3093. We are pleased to inform you that the application has been approved under expedited review.

The details of the research projects are as follows:

No	Research Title	Student's Name	Supervisor's Name	Approval Validity
1.	Academic Hardiness among Malaysians University Students: Academic Hardiness, Academic Locus of Control, Tolerance of Ambiguity, Students' Engagement and Automatic Negative Thoughts	Dexter Tan Chi Eng	Mr Ho Khee Hoong	22 December 2020 – 21 December 2021
2.	Help-seeking Behaviour of University Students During Covid-19 Pandemic: Psychological Openness, Indifference to Stigma, Help-seeking Propensity	Lee Xing		
3.	The Effect of Cognitive Behavioural Programme in Prevention Peripartum Depression and Anxiety	Lee Schea Ling	Ms Komathi Lokithasan	

The conduct of this research is subject to the following:

(1) The participants' informed consent be obtained prior to the commencement of the research;

(2) Confidentiality of participants' personal data must be maintained; and

(3) Compliance with procedures set out in related policies of UTAR such as the UTAR Research Ethics and Code of Conduct, Code of Practice for Research Involving Humans and other related policies/guidelines.

Should the students collect personal data of participants in their studies, please have the participants sign the attached Personal Data Protection Statement for records.

Thank you.

Yours sincerely,

Professor Ts Dr Faidz bin Abd Rahman
Chairman
UTAR Scientific and Ethical Review Committee

c.c Dean, Faculty of Arts and Social Science
Director, Institute of Postgraduate Studies and Research

Kampar Campus : Jalan Universiti, Bandar Barat, 31900 Kampar, Perak Darul Ridzuan, Malaysia
Tel: (605) 468 8888 **Fax**: (605) 466 1313
Sungai Long Campus : Jalan Sungai Long, Bandar Sungai Long, Cheras, 43000 Kajang, Selangor Darul Ehsan, Malaysia
Tel: (603) 9086 0288 **Fax**: (603) 9019 8868
Website: www.utar.edu.my

Universiti Tunku Abdul Rahman			
Form Title : **Sample of Submission Sheet for FYP/Dissertation/Thesis**			
Form Number : **FM-IAD-004**	Rev No: **0**	Effective Date: **21 June 2011**	Page No: **1 of 1**

FACULTY/INSTITUTE* OF Arts and Social Science
UNIVERSITI TUNKU ABDUL RAHMAN

Date: 14/9/2021

SUBMISSION OF FINAL YEAR PROJECT /DISSERTATION/THESIS

It is hereby certified that Dexter Tan Chi Eng (ID No: 1806778) has completed this final year project/ dissertation/ thesis* entitled "Academic Hardiness among Malaysian University Students: Academic Hardiness, Academic Locus" under the supervision of Ho Khee Hoong (Supervisor) from the Department of _____, Faculty/Institute* of _____, and _____ (Co-Supervisor)* from the Department of _____, Faculty/Institute* of _____.

I understand that University will upload softcopy of my final year project / dissertation/ thesis* in pdf format into UTAR Institutional Repository, which may be made accessible to UTAR community and public.

Yours truly,

Name: Dexter Tan Chi Eng

**Delete whichever not applicable*

UNIVERSITI TUNKU ABDUL RAHMAN
FACULTY OF ARTS AND SOCIAL SCIENCE
DEPARTMENT OF PSYCHOLOGY AND COUNSELLING

UAPC3093 PROJECT PAPER II

Quantitative Research Project Evaluation Form

TURNITIN: ***'In assessing this work you are agreeing that it has been submitted to the University-recognised originality checking service which is Turnitin. The report generated by Turnitin is used as evidence to show that the students' final report contains the similarity level below 20%.'***

Project Title: Academic Hardiness among Malaysian University Students: Academic Hardiness, Academic Locus of Control, Tolerance of Ambiguity, Student's Engagement and Automatic Negative Thoughts.	
Supervisor: Mr. Ho Khee Hoong	
Student's Name: Dexter Tan Chi Eng	Student's ID 1. 1806778

INSTRUCTIONS:
Please score each descriptor based on the scale provided below:

1. Please award 0 mark for no attempt.

2. Please mark only **3(A)** or **3(B)** for **Proposed Methodology**.

3. For criteria **7**:

   Please retrieve the marks from "**Oral Presentation Evaluation Form**".

1. ABSTRACT (5%)	**Max Score**	**Score**
a. State the main hypotheses/research objectives.	5%	
b. Describe the methodology: • Research design • Sampling method and sample size • Location of study • Instruments/apparatus/outcome measures (if applicable) • Data gathering procedures	5%	
c. Describe the characteristics of participants.	5%	
d. Highlight the outcomes of the study or intervention, target behaviour and outcomes.	5%	
e. Conclusions, implications, and applications.	5%	
Sum	25%	/25%
Subtotal (Sum/5)	5%	/5%
Remark:		

2. (A) METHODOLOGY (25%)	**Max Score**	**Score**
a. Research design/framework: • For experiment, report experimental manipulation, participant flow, treatment fidelity, baseline data, adverse events and side effects, assignment method and implementation, masking (if applicable). • For non-experiment, describe the design of the study and data used.	5%	
b. Sampling procedures: • Justification of sampling method/technique used. • Description of location of study. • Procedures of ethical clearance approval.	5%	
c. Sample size, power, and precision: • Justification of sample size. • Achieved actual sample size and response rate. • Power analysis or other methods (if applicable).	5%	
d. Data collection procedures: • Inclusion and exclusion criteria. • Procedures of obtaining consent. • Description of data collection procedures. • Provide dates defining the periods of recruitment or repeated measures and follow-up. • Agreement and payment (if any).	5%	
e. Instruments/questionnaire used: • Description of instruments • Scoring system • Meaning of scores • Reliability and validity	5%	
Subtotal	25%	/25%
Remark:		

2. (B) METHODOLOGY – SINGLE-CASE EXPERIMENT (25%)	**Max Score**	**Score**
a. Research design/framework: • Identify the design, phase and phase sequence, and/or phase change criteria. • Describe procedural changes that occurred during the investigation after the start of the study (if applicable). • Describe the method of randomization and elements of study that were randomized (if applicable). • Describe binding or masking was used (if appliable).	5%	
b. Participants AND Context AND Approval: • Describe the method of recruitment. • State the inclusion and exclusion criteria. • Describe the characteristics of setting and location of study. • Procedures of ethical clearance approval. • Procedures of obtaining consent.	5%	
c. Measures and materials used: • Operationally define all target behaviours and outcome measures. • Reliability and validity. • Justify the selection of measures and materials. • Describe the materials.	5%	
d. Interventions: • Describe the intervention and control condition in each phase. • Describe the method of delivering the intervention. • Describe evaluation of procedural fidelity in each phase.	5%	
e. Data analysis plan: • Describe and justify all methods used to analyze data.	5%	
Subtotal	25%	/25%
Remark:		
3. RESULTS (20%)	**Max Score**	**Score**
a. Descriptive statistics/Sequence completed: • Demographic characteristics • Topic-specific characteristics • For single-case study, report the sequence completed by each participant, trial for each session for each case, dropout and reason if applicable, adverse events if applicable	5%	
b. Data diagnostic and missing data (if applicable): • Frequency and percentages of missing data (compulsory). • Methods employed for addressing missing data.	5%	

• Criteria for post data-collection exclusion of participants. • Criteria for imputation of missing data. • Defining and processing of statistical outliers. • Data transformation. • Analyses of data distributions.		
c. Appropriate data analysis for each hypothesis or research objective.	5%	
d. Accurate interpretation of statistical analyses: • Accurate report and interpretation of confidence intervals or statistical significance. • Accurate report of *p* values and minimally sufficient sets of statistics (e.g., *dfs*, *MS*, *MS error*). • Accurate report and interpretation of effect sizes. • Report any problems with statistical assumptions.	5%	
Subtotal	20%	/20%
Remark:		

4. DISCUSSION AND CONCLUSION (20%)	**Max Score**	**Score**
a. Discussion of findings: • Provide statement of support or nonsupport for all hypotheses. • Analyze similar and/or dissimilar results. • Justifications for statistical results in the context of study.	5%	
b. Implication of the study: • Theoretical implication for future research. • Practical implication for programs and policies.	5%	
c. Relevant limitations of the study.	5%	
d. Recommendations for future research.	5%	
Subtotal	20%	/20%
Remark:		

5. LANGUAGE AND ORGANIZATION (5%)	**Max Score**	**Score**
a. Language proficiency	3%	
b. Content organization	1%	
c. Complete documentation (e.g., action plan, originality report)	1%	
Subtotal	5%	/5%
Remark:		

6. APA STYLE AND REFERENCING (5%)	**Max Score**	**Score**
a. 7th Edition APA Style	5%	/5%
Remark:		

***ORAL PRESENTATION (20%)**	**Score**		
	Student 1	Student 2	Student 3
Subtotal	/20%	/20%	/20%
Remark:			
PENALTY	**Max Score**	**Score**	
Maximum of 10 marks for LATE SUBMISSION, or POOR CONSULTATION ATTENDANCE with supervisor.	10%		
	Student 1	Student 2	Student 3
****FINAL MARK/TOTAL**	/100%	/100%	/100%

*****Overall Comments:**

Signature: _____

Date: _____

Notes:

1. **Subtotal**: The sum of scores for each assessment criterion
2. **FINAL MARK/TOTAL**: The summation of all subtotal score
3. Plagiarism is **NOT ACCEPTABLE**. Parameters of originality required and limits approved by UTAR are as follows:
   (i) **Overall similarity index is 20% or below**, and
   (ii) **Matching of individual sources listed must be less than 3%** each, and
   (iii) Matching texts in continuous block must **not exceed 8 words**

   Note: Parameters (i) – (ii) shall exclude quotes, references and text matches which are less than 8 words.

Any works violate the above originality requirements will NOT be accepted. Students have to redo the report and meet the requirements in **SEVEN (7)** days.

*The marks of "Oral Presentation" are to be retrieved from **"Oral Presentation Evaluation Form".**
**It is compulsory for the supervisor/examiner to give the overall comments for the research projects with A- and above or F grading.