

**Investigating the effect Locus of Control, Irrational Beliefs and Self-Efficacy have on
Anxiety levels of University Students.**

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Abstract

Empirical research findings have demonstrated the extremely high prevalence of mental health problems in university students. Such findings have reported anxiety as being one of the most common psychological problems experienced by university students. A convincing amount of literature highlighted the effect efficacy, personal control and irrational beliefs had on anxiety levels of clinical and non-clinical samples. Yet, there was a dearth of research examining the unique role locus of control, self-efficacy and irrational beliefs had on anxiety levels of university students. Thus, the primary aim of the current study sought to investigate the effect locus of control, self-efficacy and irrational beliefs had on anxiety levels of university students. The current sample consisted of 120 university students including 44 males and 76 females. The following measures were used; Beck Anxiety Scale, Rotter's Locus of Control scale, General Self-Efficacy Scale and the Exam Belief Scale. Data was analysed using Standard Multiple Regression Analyses. Statistical analyses revealed that locus of control and self-efficacy were significant predictors of anxiety levels of university students. Irrational beliefs did not have a significant impact on university student's anxiety levels. In the final analyses, the model explained 52% of variance. The prevalence of anxiety in the current sample demonstrated high levels of anxiety among university students. Interestingly, self-efficacy was found to be the highest predictor of anxiety levels.

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Introduction

What is Anxiety?

Over the last two decades the attempt to identify the influences, causes and effects of anxiety have become a major topic of debate across clinical and psychological research. During this time, systematic review of anxiety literature has identified a multitude of varying definitions for anxiety (Craske et al. 2009). Anxiety can be defined as a persistent unpleasant emotional state of dread, apprehension, worry, fear and impending disaster or tension and uneasiness (Pilkington, Kirkwood, Rampes, Cummings, & Richardson, 2007). While the construct of anxiety includes a wide range of different typologies researchers have highlighted that the causes of anxiety consists of multiple factors such as biological, psychological, physical and social factors that are mediated by risk and protective factors, thus, causing an individual to react to what they perceive as an environmental threat or challenge (Somers, Goldner, Waraich, & Hsu, 2006). In addition, anxiety has been recognised as one of the most prevalent psychological disorders to date, therefore, gaining a comprehensive understanding of this construct may provide an important contribution to understanding human behaviour (Spielberger, Gonzalez-Reigosa, Martinez-Urrutia, Natalicio, & Natalicio, 2017).

According to the literature several theorists have expressed controversy on identifying anxiety as an emotion. However, current research suggests that this construct is a form of emotional state (Spielberg, 2010). As highlighted by Spielberg and Reheiser (2009), feelings that arise from anxiety such as tension, apprehension, fear or uneasiness can have a significant impact on psychological health and well-being. Therefore, it is essential to investigate causes for such emotional states as they have been identified as being a key factor in motivating our behaviour. The construct of anxiety was first conceptualised as a form of adaptability that motivates our behaviour enabling us to cope during what we perceive as a harmful or

threatening situation through Darwin's evolutionary theory followed by Freud's danger signal theory (Speilberger & Reheiser, 2009). In addition, these theories have highlighted the importance of the relationship between motivation, internal cues and one's perception of a threatening environment (Matthews & Macleod, 1985). Moreover, according to the literature third level education has been associated with numerous stressors that may influence an individual's ability to cope with such demands, thus, impacting student's psychological well-being (Abouserie, 1994; Andrews, & Wilding, 2004; Baker, 2004; Barker, Howard, Villemaire-Krajden, & Galambos, 2018; Regehr, Glancy, & Pitts, 2013)

Prevalence of Anxiety

The prevalence of anxiety in university students has been acknowledged by students and educators across psychological literature (Vitasari, Wahab, Othman, Herawan, & Sinnadurai, 2010). Over time, several meta-analytic studies have reported anxiety as being one of the most common psychological problems experienced by university students (Dyrbye, Thomas, & Shanafelt, 2006). In addition, such findings have reported extremely high prevalence of mental health problems in university students, therefore, providing sufficient evidence of them being an at-risk population (Stallman, 2010). This may be associated with the continual psychosocial changes university students encounter while coping with academic and social demands (Bayram, & Bilgel, 2008). The literature suggests most lifetime psychological problems such as anxiety have been found to first occur during or shortly after the typical college age (Eisenberg, Gollust, Golberstein, & Hefner, 2007). Furthermore, individuals who suffer from high levels of anxiety have reported having a poorer quality of life compared to individuals with low levels of anxiety (Barrera, & Norton, 2009). Therefore, investigating what psychological factors contribute to anxiety symptomology in university students has become a growing concern for educational researchers and practitioners (Kargar,

Tarmizi, & Bayat, 2010). Manifestations of anxiety are critical signs that indicate an individual's level of psychological well-being, thus, by examining anxiety levels it enables researchers, educators and practitioners to gain an understanding of the intensity, and effects of such emotions allowing for a more comprehensive view of an individual's overall psychological well-being (Spielberger & Reheiser, 2009). Researchers contend that while university students experience a multitude of academic challenges these may not be the most significant factor contributing to high levels of anxiety. It may be student's perception of such abilities that may be significantly correlated to increased levels of anxiety (Beiter et al. 2015).

One of the most researched and well established areas examining anxiety and university students is the relationship between anxiety and academic achievement and performance (Alpert, & Haber, 1960; Chapell et al. 2005; DeBerard, Spielmans & Julka, 2004; Rana, & Mahmood, 2010; Richardson, Abraham & Bond, 2012). However, the literature remains relatively scarce on the risk factors associated with high anxiety levels in university students (Al-Qaisy, 2011; Dahlin, Joneborg, & Runeson, 2005). As highlighted by Beriter et al. (2015), a variety of factors may contribute to a student's anxiety levels, therefore it is essential to provide the necessary treatment options that is most beneficial to the individual. Research has highlighted that as psychological disorders such as anxiety are increasing in the general population less is known about such symptomology in the student population (Eisenberg et al. 2007). Furthermore, as highlighted by Robinson et al. (2013), to gain a comprehensive understanding on the effects of risk factors associated with high levels of anxiety one must understand the relationship between emotion and cognition.

Cognitive Perspective

According to the literature the cognitive approach has strongly influenced several areas of psychology and education with a primary interest in the relationship between cognition and emotion (Kiaei, & Reio, 2014; Romainville, 1994; Trainin, & Swanson, 2005). In addition, contemporary theorists view emotion and cognition as being fully integrated as emotion prepares an individual to react or respond to experiences in their environment (Inzlicht, Bartholow, & Hirsh, 2015). The relationship between cognition and behaviour has been extensively researched across several domains while emphasising the influential role our cognitions have over determining our behaviour across a variety of contexts (Bertrams & Dickhäuser, 2009; Dreisbach & Goschke, 2004; Hollnagel, 1998; 2004). Furthermore, low behavioural and emotional control have been identified as being key factors in anxiety symptomology therefore, it has been widely acknowledged across literature that cognitions play a significant role in psychological adjustment.

Locus of Control

According to the literature a primary component of anxiety is worry, which can be associated with repetitive thoughts in relation to threatening outcomes, the potential consequences that may occur and the fear of losing control during a particular experience (Huberty, 2009). Previous studies have associated worry with both anxiety and negative, intrusive cognitions (Davey, Hampton, Farrell, & Davidson, 1992). In addition, findings have reported that the inefficiency of worrying results in negative responses and solutions to everyday events. Thus, it is reasonable to assume that low perceived control may negatively affect anxiety levels. The relationship between perceived control and psychological functioning has been investigated across an extensive body of literature (Manne, & Glassman, 2000; Ross, & Mirowsky, 2013; Skinner, 1996; Thompson, Sobolew-Shubin, Galbraith,

Schwankovsky, & Cruzen, 1993). In addition, personal control has been identified as being one of the most critical factors that influence an individual's psychological health and well-being (Roddenberry, & Renk, 2010). Several meta analytic studies have reported medium effect sizes between external locus of control and psychological functioning (Cheng, Cheung, Chio, & Chan, 2013). Thus, it may be reasonable to suggest that such findings imply that psychological distress may be associated with one's belief in the lack of control they obtain over events and outcomes.

As highlighted by April Dharani and Peters (2012), the level of control an individual has on their internal psychological environment and their behavioural expression to an event are important factors that are associated with overall psychological well-being. Choprita and Barlow (1998), describe control as the ability to personally influence events and outcomes in our environment. One of the most researched and well established areas when investigating levels of control is Rotter's Locus of control, a psychological and social theory referring to the extent of which an individual perceives reinforcement contingencies that occur in their environment (Rotter, 1996). Rotter's theory consists of two elements, internal locus of control (i.e. individuals who believe they have control over their own lives) and external locus of control (i.e. individuals who believe their lives are controlled by outside influences such as other people, luck or fate) (Wang, Bowling, & Eschleman, 2010). In addition, recent research has identified locus of control as being a key contributor to an individual's perception on their emotions and behaviours (Arslan, Dilmac, & Hamarta, 2009).

The theory of locus of control is a construct that is a reflection on an individual's beliefs or perceptions regarding who is in control of their external environment (April, Dharani, & Peters, 2012). In addition, Ong, Bergeman and Bisconti (2005), highlight that anxiety may be perceived as the inability to exert control over one's environment. Moreover, a meta-analytic study examining the relationship between self-control and various behaviours found that increased perceived control during times of anxious states can help act as a buffer towards such symptomology (De Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012). A multitude of longitudinal studies have reported a positive correlation between students with high levels of internal locus of control and personal autonomy (Reeve, & Jang, 2006). Individuals with low levels of internal locus of control can decrease feelings of anxiety by increasing their personal perception of control (Gallagher, Bentley, & Barlow, 2014).

In summary, such findings indicate that psychological functioning such as anxiety appears to be influenced by an individual's belief about control, therefore, one's belief about control may be an important predictor of an individual's psychological functioning. A cross temporal meta-analysis was conducted on the increase of externality in locus of control and found that over time reports show an increase in student's likeability to report external causes for events in their life in contrast to internal causes (Twenge, Zhang, & Im, 2004). Theorists believe that this may occur due to one's social environment having a considerable impact on an individual's level of locus of control. Therefore, in an ever-changing social environment university students may be more susceptible to changes in their levels of locus of control thus impacting their anxiety levels.

Self-Efficacy

Over the last two decades a convincing amount of literature has highlighted the relationship between self-processes and psychological adjustment (Bandura, 1977; Bandura, 1993; Maddux & Klieman, 2012). In addition, the psychological construct of self-efficacy has been recognised as providing a large contribution to the current literature across educational psychology (Pajares, 1996; Tate et al. 2015; Van Dinther, Dochy, & Segers, 2011). Bandura and Wessels (1994), define self-efficacy as an individual's belief in their capabilities to produce a desired effect through their own actions. Bandura demonstrated that our perceived level of self-efficacy allows us to exercise control over stressors has a primary role in influencing an individual's level of anxiety (Morton, Mergler, & Boman, 2014). Research suggests, self-efficacy may help enhance one's ability to manage difficulties faced during demanding situations therefore, allowing an individual to perceive demanding situations as a challenge as oppose to a threatening situation. Thus, by exercising control over such experiences may help prevent negative thinking patterns, therefore, it may be reasonable to assume that those who cannot control these threatening situations may be susceptible to experiencing high levels of anxiety (Morton, Mergler, & Boman, 2014).

Banduras social learning theory criticised early research on the relationship between the mind and processing information as it neglected a self-regulatory system that contributed to human behaviour and adaptation (Bandura, 1993). Indeed, self-efficacy has been demonstrated to influence individual choices, perseverance to a task, regulation of one's behaviour and the ability for self-reflection (Dinther, Dochy & Segers 2011). Moreover, Bandura (1977), developed efficacy expectations as a mechanism of operation theory which is based on the assumption that psychological functioning creates and strengthens expectations of personal efficacy. Conversely, as highlighted by Maddux (2016), self-efficacy beliefs are

not outcome expectancies but an individual's belief that one can perform the behaviour that produces the outcome. Outcome expectancies refer to perceptions of the association between behaviour and outcome (e.g., If I attend all my lectures I will get good marks). In contrast, efficacy expectancies are centred on some students believing that extra effort leads to better marks but see themselves as not having the necessary skills to generate the effort required. In addition, the theory of planned behaviour states that perceived ability beliefs are a prominent factor in determining an individual's behaviour (Ajzen, 2002). The emphasis each present theory depicts is based on the level of control an individual has on their behaviour itself rather than control over the outcomes of events. Therefore, it may be suggested the following theories infer that individuals possess a self-system that enables them to apply a measure of control over their own thoughts, feelings and actions. In addition, research has demonstrated that difficulties with thought regulation have been positively associated with anxiety symptomology (Tangney, Baumeister, & Boone, 2004). Indeed, research findings have outlined that consequences of anxiety may occur due to interruption of an individual's self-regulation system, therefore, assessment of the relationship between an individual's self-regulatory system and anxiety is necessary (Carver, & Scheier, 1998). Thus, by investigating the effect of self-efficacy on anxiety levels allows for a more comprehensive understanding of the initiation and maintenance of such behaviour.

Self-efficacy and University students

As highlighted by Schwarzer (2013), in terms of the relationship between emotion and behaviour the cognitive approach has provided better enhanced concepts that have allowed for a more comprehensive understanding of anxiety across a variety of contexts. As previously mentioned, recent research has shown a growing interest in the relationship between self-efficacy and university students. Substantial empirical evidence has been obtained on the

relationship between self-efficacy and academic performance of university students (Capara et al. 2008; Dinther et al. 2011; Komarraju, & Nadler, 2013; Mills, Pajares, & Herron, 2007). In addition, a considerable focus within the literature was given to self-efficacy in; procrastination, achievement and motivation in university students (Haycock, McCarthy, & Skay, 1998; Klassen, Krawchuk, & Rajani, 2008; Pajares, 2003; Turner, Chandler, & Heffer, 2009). Meta analytic studies have reported medium to large effects for high levels of self-efficacy and high levels of academic performance. Even more promising, such findings reported medium to large effects for low levels of self-efficacy and low levels of academic achievement (Richardson, Abraham, & Bond, 2012). However, as research comparisons between students and the general population have reported that students measure an inferior level of psychological well-being such as anxiety compared to the general population, research has appeared to neglect the effect of self-efficacy on anxiety levels of university students (Cooke, Bewick, Barkham, Bradley, & Audin, 2006). Researchers argue that measures of general self-efficacy have not found to be as useful as more specific self-efficacy measures in predicting what people will do in under more specific circumstances (Maddox, 2016). Such scales have been used for examining the relationship between procrastination in university students in relation to the role of self-efficacy and anxiety, academic self-efficacy and university students, mathematics self-efficacy and computer self-efficacy among others (Betz, & Hackett, 1983; Chemers, & Garcia, 2001; Haycock et al. 1998; Sam, Othman, & Nordin, 2005).

Self-efficacy, Locus of Control and Anxiety

Research conducted on anxiety, locus of control and self-efficacy have been linked with an individual's behaviour emphasising their ability to cope during a time they perceive as a threat. In addition, high levels of self-efficacy allow an individual to challenge difficult tasks and not engage in apprehensive thinking which has been identified as a key factor of anxiety symptomology. It has been argued that the indirect impact of self-efficacy beliefs occur as a consequence of the way they affect cognitive processes (Bartimote-Aufflick, Bridgeman, Walker, Sharma, & Smith, 2016). Moreover, the environment in which these events occur play a significant role as some events are out of personal control and contain some level of risk, therefore, it may be suggested that exercise of control over anxiety may involve efficacy in controlling dysfunctional apprehensive cognitions. Thus, by gaining a comprehensive understanding of constructs such as self-efficacy and locus of control in relation to anxiety it allows us to enhance awareness and understanding of individual feelings thus, enabling individuals to develop more effective coping strategies (Speilberger & Rehesier, 2009). As highlighted by Bayram and Bilgel (2008), university students encounter several challenging and stressful environments due to financial, social and academic demands. Therefore, it may be suggested that this population of interest may be more susceptible at utilising efficacy ability in controlling dysfunctional apprehensive cognitions

Conversely, Judge and Bono (2001), have highlighted whether self-efficacy and locus of control are indicators of a common core construct. The process of identifying broad versus specific factors in psychology may result in what is referred to as bandwidth-fidelity paradox particularly when examining individual differences (Judge, Erez, Bono, & Thoresen, 2002). However, much of the findings supporting self-efficacy and locus of control as being a common core construct have been found to contain several limitations with results remaining

inconclusive (Judge et al. 2002). Recent research contends that while locus of control refers to individual beliefs in relation to the main underlying cause of events (i.e. judgments of likely consequences) in contrast they report that self-efficacy refers to the production of specific actions (i.e. judgement of one's own capabilities). Thus, by perceiving a contingency between a potential action and potential outcome and using self-regulatory system it can help create better coping strategies. Therefore, experiencing no contingency between an individual's action and outcome can result in further attributing this to one's lack of ability and may be suggested to lead to high levels of anxiety (Schwarzer, 2013).

Cognitive Appraisal

Over the last decade examining the absence of individual positive psychological characteristics and the presence of negative personal characteristics has received growing interest in relation to anxiety symptomology (Takebayashi, Tanaka, Sugiura, & Sugiura, 2017). As humans, we are presumed to be evaluating organisms using our environment as a guide to what we need or desire and evaluating each input based on its relevance and significance. In addition, it has been proposed that while studying individual differences when examining psychological adjustment such as anxiety and other emotions, each consists of an underlying appraisal which must be specified in terms of a particular appraisal. (McNally, 2001). Therefore, it may be suggested that emotion must be viewed as occurring due to changes in cognitive activity that occur due to input of information, feedback from the reaction and personal reflection (Spielberger, 2013).

Mennin et al. (2002), argued that emotions serve as information functions that are cues for readiness of action thus, allowing an individual to establish, maintain or disrupt relationships to an event in their environment. University students experience several different changes in their environment throughout their time in academics. Research suggests, some of these changes involve being confronted with what may be considered as life threatening tasks thus, may be perceived as anxiety provoking situations. (Rodgers & Tennison, 2009). Lazarus and Folkman (1984), describe cognitive appraisal as evaluative cognitive processes that intervene between the event and the reaction. Thus, by defining cognitive processes that account for individual differences in how they impact anxiety levels is an important foundation for understanding these differences (Roddenberry & Renk, 2010). Lazarus and Folkman (1984), distinguishes between two types of cognitive appraisals; primary and secondary. Primary appraisals are shaped by an individual's characteristics such as their personal beliefs (e.g. belief of the extent an individual can control an outcome) which play a significant role in the interaction between individuals and their environment. Secondary appraisals are shaped by an individual's personal evaluations of demands of a current situation, their ability to cope with such demands and ability to implement effective coping strategies. Hyland and Boduszek (2012), acknowledged that emotions are not conceptualised in response to intensity of experience but rather as distinct results of independent cognitive appraisals. Therefore, contends that dysfunctional and functional emotional responses are independently mediated by rational and irrational beliefs.

Irrational Thinking

Research and theories such as these have helped to highlight the important role cognition has on psychological functioning such as anxiety and the problem associated with separating cognition from emotion when examining constructs such as anxiety (Chambless, & Gillis, 1993; Sternberg, & Ben-Zeev, 2001; Wong, 2008). Cognitive theorists have demonstrated irrational thinking as being a primary factor in contributing to high levels of anxiety (Bridges, & Harnish, 2010). Researchers have also found strong correlations between functional emotions and rational beliefs (Dryden, 2014). In addition, a meta analyses study reported a moderate robust relationship ($r = 0.38$) between irrational beliefs and psychological distress (Vîslâ, Flückiger, Holtforth & David, 2016). Ellis and Harper (1961), developed the Rational Emotive Behaviour Theory which states that dysfunctional thinking such as irrational thoughts are the cause of dysfunctional emotions and behaviour.

The primary view of this theory contends that when an irrational thought is experienced the reaction is often problematic which can lead to negative emotions such as anxiety. Further research supported this by demonstrating that rationality of an individual's personal belief system and internal self-statements can impact an individual's emotional and behavioural responses (Himle, Thyer, & Papsdorf, 1982). Therefore, by identifying irrational beliefs it may allow for a more comprehensive view of an individual's dysfunctional responses to a giving situation (Beck, Butler, Brown, Dahlsgaard, Newman, & Beck, 2001). The primary assumption of the cognitive approach in changing human behaviour is that emotional reactions to events experienced in the environment are a product of how an event is analysed or interpreted (Davison, Robins, & Johnson, 1983). Theoretically, from previous research it may be assumed that students experience an extensive diversity of emotions. While students are under more pressure now socially, academically and financially it therefore implies that students are a

vulnerable group thus, student's ability to manage emotions effectively may warrant further investigation (Pekrun, Goetz, Titz, & Perry, 2002).

Substantial empirical evidence has been obtained to support both the efficacy and effectiveness of psychotherapy treatments such as rational emotive behaviour therapy in mediating between irrational thoughts and psychological distress (Bandelow et al. 2015; Cartwright-Hatton, Roberts, Chitsabesan, Fothergill, & Harrington, 2004; Norton, & Price, 2007; Otto, Smits, & Reese, 2004). Eysenck (2013), states that clinical practitioners believe individuals suffering from anxiety have irrational negative and self-defeating thoughts about themselves and their circumstances. Therefore, the success of therapies such as cognitive behavioural therapy indicates the significant role cognitions have on anxiety levels, thus, by reducing or eliminating negative beliefs of one's self and their environment it may help to reduce anxiety levels.

Rationale

Over the last two decades the attempt to identify the influences, causes and effects of anxiety have become a major topic of debate across clinical and psychological research. The prevalence of anxiety in university students has been acknowledged by students and educators across psychological literature (Vitasari et al. 2010). In addition, findings have reported anxiety as being one of the most common psychological problems experienced by university students (Dyrbye, Thomas, & Shanafelt, 2006). High anxiety levels in university students have been associated to poor academic performance and high dropout rates (Cassady, 2002; Pritchard, Mary, & Wilson, 2003). According to the literature most lifetime psychological problems such as anxiety have been found to first occur during or shortly after the typical college age having a significant impact on one's overall psychological well-being (Eisenberg et al. 2007).

However, there is a dearth of empirical findings related to the factors that predict anxiety levels of university students.

The relationship between perceived control and psychological functioning has been investigated across an extensive body of literature (Manne, & Glassman, 2000; Ross, & Mirowsky, 2013; Skinner, 1996; Thompson, Sobolew-Shubin, Galbraith, Schwankovsky, & Cruzen, 1993). Personal control has been identified as being one of the most critical factors that influence an individual's psychological health and well-being (Roddenberry, & Renk, 2010). In addition, Ong, Bergeman and Bisconti (2005), highlight that anxiety may be perceived as the inability to exert control over one's environment. Therefore, in an ever-changing social environment university students may be more susceptible to changes in their levels of locus of control thus, impacting their anxiety levels. The psychological construct of self-efficacy has been recognised as providing a large contribution to the current literature across educational psychology (Pajares, 1996; Tate et al. 2015; Van Dinther et al. 2011). Research findings have outlined that consequences of anxiety may occur due to interruption of an individual's self-regulation system therefore, assessment of the relationship between an individual's self-regulatory system and anxiety is necessary (Carver, & Scheier, 1998). Cognitive theorists have demonstrated irrational thinking as being a primary factor in contributing to high levels of anxiety (Bridges, & Harnish, 2010). In addition, researchers have also found strong correlations between functional emotions and rational beliefs (Dryden, 2014).

The following findings provide sufficient evidence that it is prudent to investigate the effects self-efficacy, locus of control and irrational beliefs have on anxiety levels of university students. In addition, by examining anxiety levels and variables that contribute to such

symptomology it enables researchers, educators and practitioners to gain an understanding of the intensity, and effects of such emotions. This allows for a more comprehensive view of an individuals over all psychological well-being. Thus, allowing for new approaches and methods to help students develop better coping skills and overall decrease high levels of anxiety.

Research Aims

In essence, the current study seeks to investigate the effects locus of control; self-efficacy; and irrational beliefs have on anxiety levels of university students. Consistent with past research on locus of control, this study hypothesises that university students with higher levels of external locus of control will have higher levels of anxiety, university students with higher levels of self-efficacy will have lower levels of anxiety and lastly university students with higher levels of irrational beliefs will have higher anxiety levels.

Method

Participants

Participants for the current study consisted of 120 university students. Total sample size of 120 participants ($n = 120$). The sample was comprised of 44 males and 76 females who ranged in age from 17-57 years, mean age (M) = 24 and a standard deviation (SD) = 10.1. The population of interest were university students. Participants were recruited for the current study through random sampling from the general student population.

Measures

The materials and measures for this study consisted of an information leaflet (Appendix 1), consent form (Appendix 2), demographic questions (Appendix 3), and four self-report questionnaires. These questionnaires consisted of the Beck Anxiety Scale (Beck, & Steer, 1990; Appendix 4), Rotter's Locus of Control (Rotter, 1996; Appendix 5), General Self-Efficacy Scale (Jerusalem, & Schwarzer, 1995; Appendix 6) and the Exam belief scale (ABS-II; DiGiuseppe, Leaf, Exner, & Robin, 1998) (Appendix 7). All measures were electronic copies accessed through a web link.

Information leaflet

The information leaflet was designed by the researcher to inform participants on the title of the study, objectives, purpose of participation, the nature of the study, participants rights and confidentiality.

Consent form

The consent form was designed by the researcher with the aim of receiving informed consent from each participant to take part in the current study. Indicating they understood their right to withdraw from the study and that they have read the information sheet provided.

Demographic Questionnaire

The demographic questionnaire was designed by the researcher for participants to indicate their age, sex and level of study.

Irrational Belief Scale

Irrational beliefs were measured using a 4-item scale that was derived from the Exam Belief Scale which is an 8-item scale constructed to measure specific exam related irrational and rational beliefs that was derived from the Attitude and Beliefs Scale (ABS-II; DiGiuseppe, Leaf, Exner, & Robin, 1998). For the purpose of this study only the 4 irrational beliefs from the Exam Belief Scale were administered to participants as the aim was to solely examine irrational beliefs. Participants were instructed to indicate the extent to which they agreed with each statement on a 4-point scale ranging from 1 (strongly agree) to 4 (strongly disagree). Scores range from 0-16 with higher scores indicating high levels of irrational thinking.

Beck Anxiety Inventory

The Beck Anxiety Inventory (BAI) (Beck, & Steer, 1990), was utilised to measure anxiety. The BAI is a scale that has been administered across numerous clinical and non-clinical samples (Bieling, Cox, Enns, & Swinson, 1998). The BAI consists of self-report items that are rated on a 4-point severity scale ranging from 0 (not at all) to 3 (severe). Scores from the 21 items are summed to yield a single anxiety score. Potential scores range from 0 to 63, with elevated scores indicating presence of severe anxiety (Beck, & Steer, 1990). Previous research has shown reliability and internal consistency of this scale have proved to be highly internally consistent Cronbach's Alpha of .94 and reliability $r = .67$ (Fydrich, Dowdall, & Chambless, 1992). A later study demonstrated a similar finding of high levels of internal consistency for the BAI Cronbach's Alpha of .93 (Magán, Sanz, García0Vera, 2008). Strong evidence for reliability and validity has been demonstrated across multiple samples including, older adults, adolescents, medical, outpatients, inpatients and psychiatric patients (Osman et al., 2002; Wetherell, & Gatz, 2005). Reliability analyses for the BAI revealed satisfactory internal reliability for the current study Cronbach's Alpha .95.

Rotter's Locus of Control Scale

Rotter's Locus of Control scale (I-E Scale; Rotter, 1996), was utilised to measure internal-external locus of control. This scale consists of 23 forced choice items and 6 filler items i.e. which were designed to make the questionnaire more ambiguous to respondents and avoid social desirability. These include the following statements (1, 8, 14, 19, 24, 27). The 23 forced choice items measure beliefs about the nature of the world with each item containing an internal statement paired with an external statement. The remaining 23 items are calculated together for a total score of locus of control with a total score ranging from 0 (High externality) to 23 (high internality). Responses range from 0-1. An external control statement is giving a

score of 1 oppose to an internal locus of control statement which is giving a score of 0 therefore, the higher score indicates higher levels of external locus of control (Rotter, 1971). Sample items include “I have often found what is going to happen will happen” versus “Trusting to fate has never turned out as well for me as making a decision to take a definitive course of action” and “Many of the unhappy things in people’s lives are partly due to bad luck” versus “people’s misfortunes result from the mistakes they make”. Research studies have shown that test-retest reliability of Rotter’s Locus of Control Scale was .61 therefore, suggesting that the scale is stable over a considerable period of time (Lange, & Tiggemann, 1981). More recent research findings on a sample of older adult students have reported re-test reliability between .70 and .90 (Altmann, & Arambasich, 2012). Reliability analyses for the LOC revealed satisfactory internal reliability for the current study Cronbach’s Alpha .71.

General Self-Efficacy Scale

The General Self-Efficacy scale (Jerusalem, & Schwarzer 1995), is a 10-item scale that measures an individual’s general sense of perceived self-efficacy. (e.g. ‘I can always manage to solve difficult problems if I try hard enough’). This scale was designed for the use of general adult population. The scale is measured on a 4 point Likert scale ranging from; *1 = not at all*, *2 = hardly true*, *3 = moderately true*, and *4 = exactly true*. Scores range from 10 to 40 points with higher scores indicating a higher belief to overcome difficult situations in comparison to lower scores indicating a lower belief in one’s ability. High reliability, stability and construct validity have been found across a wide range of studies (Sherer, Maddux, Mercandante, Jacobs, & Rogers, 1982; Luszczynska, Doña, & Schwarzer, 2005; Corrigan, Watson, & Barr, 2006). A study investigating self-efficacy in a sample of psychology university students reported Cronbach’s Alpha of .80 (Rajabi, 2006). The General self-efficacy scale has also been adapted and used across 28 languages and has found to be configurable equivalent across these 28

nations reporting Cronbach's Alpha between .79 and .88 forming only one global dimension (Luszczynska, Doña, & Schwarzer, 2005). Reliability analyses for the BAI revealed satisfactory internal reliability for the current study Cronbach's Alpha .89.

Design

The current study adhered to a within subject's correlational design. The aims of the study were investigated using data from the population of university students. Quantitative research methods will be used to address the proposed research question to investigate the effect locus of control, self-efficacy and irrational beliefs have on anxiety levels of university students. In addition, all statistical analyses including descriptive statistics, person correlation and multiple regression analyses were determined using SPSS. The theory that exists in this area is strong enough to help guide the development of the testable hypothesis associated with this study.

A multiple regression analyses was conducted to investigate the effect of predictor variables (PV's) self-efficacy, locus of control and irrational beliefs on the criterion variable (CV) anxiety. Correlational analyses was conducted to investigate the relationship that exists between locus of control, self-efficacy and irrational beliefs in relation to anxiety levels of university students. Correlational analyses will tell us the direction of the relationship, the strength of the relationship and the amount of variance shared between these variables.

Procedure

Prior to study commencement, informed consent and information briefs were provided and obtained electronically. Participants for the present study were administered a link that directly led them to open an online self-reported questionnaire via free online surveys. The cover page for the questionnaires briefly outlined and explained the nature and purpose of the current study. This included being informed that the questionnaire consisted of four parts which set out to investigate the effects Locus of Control, Self-efficacy and Irrational Thinking have on anxiety levels of university students. This cover page also outlined the time duration involved in completing the survey, the nature of the study is voluntary, anonymity, and ethical considerations. Participants were made fully aware of the exact nature of the study prior to participation. Thus, no deception was used throughout any stage of the study.

Participants were required to click that they had read, understood and agreed with the terms and conditions in order to continue with the self-report questionnaire. Participants were also provided with a consent form allowing them an opportunity to voice any concerns or questions they had in relation to the current study which each participant also had to sign and date before continuing with the self-reported questionnaires. Participants were first required to fill out their demographics including their age, gender and how many years they have been in third level education. This was followed by the measure of Irrational Thinking (ABS-II; DiGiuseppe, Leaf, Exner, & Robin, 1998), Generalised Self-Efficacy scale (Jerusalem, & Schwarzer, 1995; Locus of control and the Beck Anxiety Inventory. The questionnaire took approximately ten minutes to complete. Once each participant had completed the questionnaires the data automatically stored to free online surveys that would be available to the researcher for future analyses.

Results

Descriptive statistics

Descriptive statistics including means (M), standard deviation (SD), and Cronbach's Alpha for all continuous variables (irrational thinking, general self-efficacy and locus of control) in the current study are presented in Table 1. Histograms and normal Q-Q plots were examined for each continuous variable to determine normality.

The mean score for Anxiety ($M = 23.56$, $SD = 15.06$) demonstrated that participants reported moderately high levels of anxiety. In addition, examination of the histogram revealed a mesokurtic curve with a slight positive skew to the normal distribution, while the normal Q-Q plot revealed reasonable linearity, suggesting that anxiety achieved a desirable degree of normal distribution.

The mean score for Irrational thinking ($M = 9.26$, $SD = 2.34$) demonstrated that participants reported moderate levels of irrational thinking. In addition, examination of the histogram revealed a reasonably well leptokurtic curve, while the normal Q-Q plot indicated a reasonable linearity suggesting that irrational thinking achieved a desirable degree of normal distribution.

The mean score for General Self-Efficacy ($M = 27.80$, $SD = 5.08$) demonstrated that participants reported moderately high levels of self-efficacy. In addition, examination of the histogram revealed a slightly mesokurtic curve, while the normal Q-Q plot revealed a slightly winding linearity. Overall, general self-efficacy was not normally distributed.

The mean score for locus of control ($M = 15.99$, $SD = 16.0$) demonstrated that participants reported moderate levels of locus of control. In addition, examination of the histogram revealed a slight leptokurtic curve with a slight positive skew to normal distribution, while the normal Q-Q plot revealed a reasonable linearity suggesting that locus of control revealed a desirable degree of normal distribution. Despite the small sample size the relatively low standard error values, and close 95% confidence intervals suggest that the current sample is reasonably representative of university student population.

Table 1. Descriptive statistics of all continuous variables (n = 120)

Variable	Mean (95% Confidence Intervals)	Std. Error Mean	Median	SD	Range	Cronbach
Anxiety	23.60 (20.90 – 26.30)	1.4	22	15.06	.00-61	.95
Irrational Thinking	9.30 (8.90 – 9.70)	0.2	9	2.40	4-15	.57
Locus of Control	15.9 (10.2 – 10.9)	.25	16.0	2.83	11-23	.71
Self-Efficacy	27.8 (27.0 – 29.0)	0.5	29	5.08	5-16	.89

Correlation Analyses

In advance to conducting standard multiple regression analyses, correlational analyses was required to determine the relationship between all independent variables and the dependent variable along with the relationship between all independent variables. Results from this analysis are presented in Table 2. Preliminary analyses were performed to ensure no violation of the assumptions of linearity, normality and homoscedasticity. Nonparametric Spearman's test was ran due to the non-normally distributed data.

Table 2. Correlations between all continuous variables

Variables	1	2	3	4	5
1. Anxiety	1				
2. General Self-Efficacy	-.64**	1			
3. Locus of Control	-.57**	.52**	1		
4. Irrational Thinking	-.42**	.44**	.37***	1	

Note. Statistical significance: * $p < .05$; ** $p < .01$; *** $p < .001$

Inferential Statistics

Standard Multiple Regression Analyses

Multiple regression analysis was performed to determine how well anxiety levels could be explained by three variables including irrational thinking, general self-efficacy and locus of control. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. The correlations between the predictor variables and the criterion variable included in the study were examined (see Table 2 for full details). All three of the predictor variables were significantly correlated with the criterion variable, and these significant effects ranged from $r = .42$ (irrational thinking) to $r = .68$ (self-efficacy) to $r = .85$. These results indicates that there was no violation of the assumption of multicollinearity and that the data was suitable for examination through multiple linear regression analysis.

Since no *a priori* hypotheses had been made to determine the order of entry of the predictor variables, a direct method was used for the analysis. The three predictor variables explained 52.1% of variance in anxiety levels ($F(3, 116) = 44.18, p < .001$). Two of the three variables were found to uniquely predict anxiety levels to a statistically significantly level: General self-efficacy ($\beta = .48, p < .001$), and locus of control ($\beta = .31, p = <.001$) (see Table 3 for full details).

Table 3. Multiple regression model predicting anxiety scores

	<i>R</i> ²	β	<i>B</i>	<i>SE</i>	CI 95% (<i>B</i>)
Model	.17***				
General Self-Efficacy		-.47***	-1.4	.24	-1.9 / -.94
Locus of Control		-.30***	-1.7	.43	-2.5 / -.85
Irrational Thinking		-.08	-4.8	.47	-1.4 / .45

Note. N = 120; Statistical significance: * $p < .05$; ** $p < .01$; *** $p < .001$

Discussion

The primary aim of the current study sought to empirically investigate the effects irrational thinking, locus of control and self-efficacy have on anxiety levels of university students. The potency behind this objective was derived from current research which stated that the prevalence of anxiety for university students was increasing (Eisenberg et al. 2007). Thus, the current researcher sought to add to the limited but growing literature which has referenced the relationship between university students and anxiety. The rationale for the current study was grounded considering there is a large quantity of research suggesting that locus of control, irrational thinking and self-efficacy are related to increased levels of anxiety (Bandura, 1998; Bridges, & Harnish, 2010; Jain, & Singh, 2015; Johnson, & Sarason, 1978; Soysa, & Wilcomb, 2015; Watson, 1967; Vîslâ et al. 2016). However, little empirical findings have been reported on the variables of interest and their contribution to anxiety levels of university students, thus, this study wished to establish which variables of interest contribute to increased levels of anxiety in university students. The research was therefore undertaken to contribute to the theory of anxiety and university student's psychological well-being.

Anxiety and University Students

Results from the current study indicated, that university students reported moderately high levels of anxiety on the Beck Anxiety scale as depicted in Table 1. The present findings, are consistent with previous meta analytic research, which demonstrated anxiety as being one of the most common psychological problems experienced by university students (Dyrbye, Thomas, & Shanafelt, 2006). Additional research, has identified that anxiety levels of university students are steadily increasing overtime (Beiter et al. 2015). This is consistent with other studies that have reported high rates of psychological problems such as anxiety among university students globally (Ovuga et al. 2006; Wong et al. 2006). In addition, researchers

assessed psychological symptoms in university students and found more than half of students reported moderate to very high levels of psychological distress, thus, leading to difficulties in academics and psychosocial development (Stallman, 2008). The findings derived from the current study, indicate a decrease of psychological health in university students, therefore, highlights the importance of attaining a more comprehensive view on the contributions to the increase of anxiety levels. Such findings, emphasise the importance to better refine the development of adequate and appropriate support services both clinicians and educators can provide for this at-risk population. In addition, while research has viewed education as being a protective buffer to mental health issues, the current findings suggest, that higher education may be a time of increased anxiety for university students. Therefore, the relationship between anxiety and university students is one of considerable importance due to the psychological impact of such symptomology. Moreover, the economic costs for anxiety have increased dramatically over time, thus, the role of anxiety among university students is a critical area for economic costs.

Anxiety and Self-Efficacy

The current study aimed to investigate the effect locus of control, self-efficacy and irrational beliefs have on anxiety levels of university students. Results from the Multiple Regression analyses found that two of the three constructs of interest including general self-efficacy and locus of control were significant predictors of anxiety levels of university students with general self-efficacy being the largest predictor. Indeed, Table 2 indicates that increased scores on general self-efficacy and the locus of control scale are associated with significant decreased scores on the Beck anxiety scale for university students. These findings are consistent with previous research, suggesting that high levels of self-efficacy and internal locus of control are associated with low levels of anxiety (Cheng et al. 2013; Gallagher, Bently, &

Barlow, 2014; Morton, Mergler, & Boman, 2014; Roddenberry, & Renk, 2010). Moreover, researchers have found that university students who reported higher levels of general self-efficacy reported higher levels of psychological well-being (Tong, & Song, 2004; Yu et al. 2005). The learned helplessness theory would suggest that by learning one's outcomes are uncontrollable, may result in motivational and cognitive deficits. Therefore, emphasising the role perceptions of personal competence in human behaviour possess over one's psychological well-being (Abramson, Seligman, & Teasdale, 1978; Maddux, 2016). In addition, these findings are consistent with other research. For instance, research has identified that low levels of self-efficacy play a major role in psychological problems such as anxiety and depression due to the perceived lack of ability to manage threatening situations (Maddux, 2016).

Researchers argue, that measures of general self-efficacy have not found to be as useful as more specific self-efficacy measures in predicting what people will do under more specific circumstances (Maddox, 2016). Such scales, have been used for examining the relationship between procrastination in university students in relation to the role of self-efficacy and anxiety, academic self-efficacy and university students, mathematics self-efficacy and computer self-efficacy among others (Betz, & Hackett, 1983; Chemers, & Garcia, 2001; Haycock, McCarthy, & Skay, 1998; Sam, Othman, & Nordin, 2005). Conversely, the following study indicates that self-efficacy may not be as sensitive to specific contexts in predicting anxiety levels of university students as found among research investigating self-efficacy and other such constructs. However, further research is required to establish the premise of such findings.

Moreover, research has identified that efficacy beliefs are influenced by an individual's response to their environment, particularly through social demands in one's attempt to manipulate and control demanding or challenging situations (Bitsika, Sharpley, & Rubenstein, 2010). Therefore, it may be suggested that such findings could be associated with the continual psychosocial changes university students encounter while coping with academic and social demands (Bayram, & Bilgel, 2008). Furthermore, Beiter et al. (2015) contends that while university students experience a multitude of academic and social challenges it may not only be their learning capacity or competency but an individual with a negative perception on such abilities that can be detrimental to increased anxiety levels. Indeed, the said findings suggest that there is a large effect between self-efficacy and anxiety, suggesting that high levels of self-efficacy may act as a buffer towards psychological symptomology such as anxiety. Thus, the assumption maybe made that students who believe they can perform the behaviour that produces the desired outcome may decrease anxiety symptomology and increase psychological well-being.

Anxiety and Locus of Control

Results from the Multiple Regression analyses, found that locus of control was a significant predictor of anxiety levels in university students. With high internal locus of control scores predicting low levels of anxiety and high levels of external locus of control scores predicting high levels of anxiety. These results are consistent with previous research findings on the relationship between locus of control and anxiety, supporting the existence of meaningful relationships between greater externality and higher levels of anxiety (Allen, Giat, & Cherney, 1974; Archer, 1979; Deardorff, Kendall, Finch, & Sitarz, 1977). The following result is an indication that students with an internal locus of control experience less anxiety than students with external locus of control. Individual's with internal locus of control perceive

personal control over their experiences and their environment as being contingent on their own capabilities and attributes. On the contrary, individuals with external locus of control perceive their actions as being contingent on factors outside of their personal control, therefore, they make less effort to change or improve their situation (April, Dharani, & Peters, 2012). In addition, locus of control has been found to be influential in the determination of an individual's thoughts, behaviours and emotions when coping with life events (Arslan, Dilmac, & Hamarta, 2009). Therefore, the assumption may be made that a lack of personal control for university students is associated with an individual's thoughts, behaviours and emotions, thus, giving rise to high levels of anxiety.

The following results coincide with research, that has demonstrated that individuals with external locus of control have a higher chance of experiencing psychological problems (Arslan et al. 2009). According to the literature, research has identified personal control as being one of the most critical factors that influence an individual's psychological health and well-being (Roddenberry & Renk, 2010). Furthermore, researchers have reported that individuals with high levels of internal locus of control possess social support behaviours when confronted by a difficult or challenging life event (Arslan et al. 2009). In addition, social support has been found to act as a buffer against anxiety symptomology. Moreover, this finding is supported by previous research which reported a significant correlation between high levels of external locus of control and limited coping resources (Al-Qaisy, 2011). Expectancy theory would suggest that individuals learn to discriminate behaviours and outcomes and generalise these anticipations for the future thus forming one's locus of control (April et al. 2012). Therefore, the assumption maybe made that psychological distress such as anxiety symptomology is associated with one's perception of having a lack of control over life events

and outcomes. Thus, it may be assumed that the following results indicate that beliefs about one's control are an important predictor of a student's psychological functioning.

The current findings revealed that students reported moderate to high levels of internal locus of control as depicted in Table 1. This finding is supported by the Independence Model which suggests that internal locus of control has become more evident in the greater population over recent years due to the increase in individualism and individuals having more control over their environment than previous years (Twenge, Zhang, & Im, 2004). In contrast, a meta analyses of locus of control and psychological symptoms across 18 cultural regions reported the relationship between individualism and internal locus of control to only be generalisable to western societies. Such findings, note the importance on the impact of societal differences on levels of locus of control and psychological symptoms such as anxiety (Cheng et al. 2013).

Anxiety and irrational beliefs

This study further aimed to investigate the effect irrational beliefs had on anxiety levels of university students. Through the use of standard Multiple Regression, it was found that irrational beliefs were not a statistically significant predictor of anxiety levels of university students. Indeed, Table 3 indicates students reported moderate levels of irrational thinking. The present findings are consistent with initial investigation conducted on the relationship between irrational beliefs and anxiety levels of university students, which also found students with high levels of irrational beliefs were not significantly correlated with high levels of anxiety (Chang, & Bridewell, 1998; Muran, Kassino, Ross, & Muran; 1989). Conversely, studies that have examined the relationship between anxiety and irrational beliefs of university students under stressful conditions found a significant correlation between irrational beliefs and high levels of anxiety in students (Malouff, Schutte, & McClelland, 1992). This suggests that the conditions

under which student's levels of irrational beliefs are assessed may contribute to overall levels of anxiety.

It has been investigated by researchers whether individuals experiencing different forms of anxiety and other psychological disorders have the same irrational ideas (Nieuwenhuijsen, et al. 210). In addition, DiLorenzo, David and Montgomery (2011) investigated differential contributions of general-level and disorder-specific irrational beliefs of exam related distress among students at two time periods. They reported disorder-specific irrational beliefs were a significant predictor of exam related distress when distress was measured at T2 (immediately prior to sitting an exam at the end of the year). However, neither had an independent effect on distress at T1(start of term). This would suggest that context specific versions of the various irrational belief processes offer a strong predictor of psychologically distressing outcomes (Hyland, Shevlin, Adamson, & Boduszek, 2015). Therefore, the lack of a significant correlation between irrational beliefs and anxiety levels of university students in the current sample perhaps may be greater understood when examined in the context of disorder-specific irrational beliefs. In addition, this is supported by findings that have reported specific irrational beliefs are sensitive to the timing of assessment in relation to predicting levels of psychological distress, which demonstrated greater levels of psychological distress during acute context (Montgomery, David, DiLorenzo, & Schnur, 2007).

However, findings from the present study are not consistent with further research, which demonstrated that irrational beliefs are significantly correlated with high levels of anxiety in non-university samples (Boyaciogula, & Kucuk, 2011; Bridges & Harnish, 2010; Davinson, & Zigelboim, 1987; Goldfried, & Sobocinski, 1975; Haaga, Dyck, & Ernst, 1991; Vislâ et al. 2016). However, researchers have criticised the findings supporting a positive relationship between irrational beliefs and dysfunctional emotions as the associations reported are small (Turner, 2016). None the less, the present findings appear incongruent with this notion, as irrational beliefs did not predict high levels of anxiety for university students. Moreover, the present findings are also in contrast to what would be predicted by Ellis's Rational Emotive Behaviour Therapy (REBT) model which, obtained a primary role across clinical psychology assessing the impact of cognitive dissociations namely irrational beliefs in changing psychological outcomes such as depression and anxiety. In addition, substantial empirical evidence has been obtained to support both the efficacy and effectiveness of (REBT) and (CBT) in treating a wide variety of disorders across a variety of populations and settings such as anxiety and depressive disorders (Campbell-Sills et al. 2016; David, Szentagotai, Lupu, & Cosman, 2008; Drake, Mueser, Brunette, & McHugo, 2004; Montgomery, Kunik, Wilson, Stanley, & Weiss, 2010; Roy-Byrne et al. 2010).

Implications, Limitations and Future Research

As with all research there are a number of limitations to be considered in light of the current research findings. Overall the Locus of Control, Beck Anxiety and General Self-Efficacy scale displayed good reliability which was assessed using Cronbach's Alpha. In addition, each of these scales achieved very good reliability scores. This suggests that the model was consistently measuring the correct variables. The findings revealed that general self-efficacy and locus of control were the strongest predictors on levels of anxiety in university students. The exam irrational belief scale revealed unsatisfactory internal reliability scores therefore, indicates that this model is not consistently measuring the correct variable of interest. Furthermore, demonstrating that irrational beliefs were not a strong predictor of anxiety levels in university students. In light of this, the incongruence observed between the current data and irrational belief theory may also be partially explained by measurement inconsistencies. Giving the inconsistencies with the current findings between irrational beliefs and anxiety theory future research is warranted to further examine the relationship between these constructs of interest and university students. Moreover, the study emphasises the impact both locus of control and self-efficacy have on predicting anxiety levels of university students.

There are a number of implications to be drawn from this study, namely that it was an exploratory study that aimed to augment our understanding of anxiety levels of university students. Therefore, all the current findings are preliminary benchmarked for future research. In addition, the current sample were recruited through convenience sampling, therefore, the current sample may not be wholly representative of the population of university students, and furthermore, it is unknown whether the results are generalisable to other university student populations. The following study consisted of 44 males and 76 females, therefore, the following study was predominantly females. Thus, the following results may not be a true

representation of the male population of university students. Another limitation refers to the self-report nature of the measurements. This therefore, calls in to question whether responses are a true representation of the participants views or if the responses giving were in some manner biased. For instance, responses may have been reported due to social desirability rather than honesty. However, the former statement is speculative and impossible to tell, therefore, conclusions drawn from this study need to bear this in mind. The sample consisted of 120 participants (n=120), with a recommended 20 participants per predictor variable however, future research may want to aim at obtaining a larger sample size to avoid type two errors.

Conclusions

In conclusion, this study was the first to investigate the effect of general self-efficacy, locus of control and irrational beliefs on anxiety levels of university students in a single multiple regression analyses. In addition, it expanded the literature on the contributions to high levels of anxiety among university students. Moreover, the present study highlighted the prevalence of high levels of anxiety among university students. This perhaps is not a surprising finding as recent research has also reported an increase in anxiety levels of university students. However, it highlights the importance of addressing the ascent of anxiety in the student population. In addition, the results suggested that locus of control and self-efficacy were significant predictors on anxiety levels of university students. Moreover, the model explained more than half the variance of anxiety, a figure on which future research may aim to expand upon. Furthermore, the study demonstrated that irrational beliefs was not a significant predictor of anxiety levels of university students. In essence, the present study demonstrates the impact locus of control and self-efficacy have on anxiety levels of university students. In summary, the results from the current study support the hypothesis; students with higher levels of internal

locus of control will have lower levels of anxiety and students with high levels of self-efficacy will have lower levels of anxiety.

Finally, the researcher hopes that the present findings augment our understanding on the level of anxiety experienced by university students and the effects locus of control and self-efficacy have on these levels of anxiety. Therefore, may aid researchers, educators and practitioners in the development of better coping strategies, and adequate support systems to help decrease anxiety levels of university students and promote overall better psychological well-being.

References

Abouserie, R. (1994). Sources and levels of stress in relation to locus of control and self-esteem in university students. *Educational psychology, 14*(3), 323-330.

Abramson, L. Y., Seligman, M. E., & Teasdale, J. D. (1978). Learned helplessness in humans: Critique and reformulation. *Journal of abnormal psychology, 87*(1), 49.

Ajzen, I. (2002). Perceived behavioural control, self-efficacy, locus of control, and the theory of planned behaviour. *Journal of applied social psychology, 32*(4), 665-683.

Allen, G. J., Giat, C., & Cherney, R. J. (1974). Locus of control, test anxiety, and student performance in a personalized instruction course. *Journal of Educational Psychology, 66*(6), 968.

Alpert, R., & Haber, R. N. (1960). Anxiety in academic achievement situations. *The Journal of Abnormal and Social Psychology, 61*(2), 207.

Al-Qaisy, L. M. (2011). The relation of depression and anxiety in academic achievement among group of university students. *International Journal of Psychology and Counselling, 3*(5), 96-100.

Altmann, H., & Arambasich, L. (2012). A study of locus of control with adult students. *Canadian Journal of Counselling and Psychotherapy/Revue canadienne de counseling et de psychothérapie, 16*(2).

Andrews, B., & Wilding, J. M. (2004). The relation of depression and anxiety to life-stress and achievement in students. *British Journal of Psychology*, 95(4), 509-521.

Antony, M. M., Bieling, P. J., Cox, B. J., Enns, M. W., & Swinson, R. P. (1998). Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. *Psychological assessment*, 10(2), 176.

April, K. A., Dharani, B., & Peters, K. (2012). Impact of locus of control expectancy on level of well-being. *Review of European Studies*, 4(2), 124.

Archer, R. P. (1979). Relationships between locus of control and anxiety. *Journal of personality Assessment*, 43(6), 617-626.

Arslan, C., Dilmaç, B., & Hamarta, E. (2009). Coping with stress and trait anxiety in terms of locus of control: A study with Turkish university students. *Social behaviour and personality: an international journal*, 37(6), 791-800.

Baker, S. R. (2004). Intrinsic, extrinsic, and motivational orientations: Their role in university adjustment, stress, well-being, and subsequent academic performance. *Current Psychology*, 23(3), 189-202.

Bandelow, B., Reitt, M., Röver, C., Michaelis, S., Görlich, Y., & Wedekind, D. (2015). Efficacy of treatments for anxiety disorders: a meta-analysis. *International Clinical Psychopharmacology*, 30(4), 183-192.

Bandura, A. (1988). Self-efficacy conception of anxiety. *Anxiety research*, 1(2), 77-98.

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational psychologist*, 28(2), 117-148.

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioural change. *Psychological review*, 84(2), 191.

Bandura, A., & Wessels, S. (1994). Self-efficacy.

Barker, E. T., Howard, A. L., Villemare-Krajden, R, & Galambos, N. L. (2018). The rise and fall of depressive symptoms and academic stress in two samples of university students. *Journal of youth and adolescence*, 1-15.

Barrera, T. L., & Norton, P. J. (2009). Quality of life impairment in generalized anxiety disorder, social phobia, and panic disorder. *Journal of anxiety disorders*, 23(8), 1086-1090.

Bartimote-Aufflick, K., Bridgeman, A., Walker, R., Sharma, M., & Smith, L. (2016). The study, evaluation, and improvement of university student self-efficacy. *Studies in Higher Education*, 41(11), 1918-1942.

Bayram, N., & Bilgel, N. (2008). The prevalence and socio-demographic correlations of depression, anxiety and stress among a group of university students. *Social psychiatry and psychiatric epidemiology*, 43(8), 667-672.

Beck, A. T., Butler, A. C., Brown, G. K., Dahlsgaard, K. K., Newman, C. F., & Beck, J. S. (2001). Dysfunctional beliefs discriminate personality disorders. *Behaviour research and therapy*, 39(10), 1213-1225.

Beck, A. T., & Steer, R. A. (1990). Manual for the Beck anxiety inventory. *San Antonio, TX: Psychological Corporation.*

Beiter, R., Nash, R., McCrady, M., Rhoades, D., Linscomb, M., Clarahan, M., & Sammut, S. (2015). The prevalence and correlates of depression, anxiety, and stress in a sample of college students. *Journal of affective disorders*, 173, 90-96.

Bertrams, A., & Dickhäuser, O. (2009). High-school students' need for cognition, self-control capacity, and school achievement: Testing a mediation hypothesis. *Learning and Individual Differences*, 19(1), 135-138.

Betz, N. E., & Hackett, G. (1983). The relationship of mathematics self-efficacy expectations to the selection of science-based college majors. *Journal of Vocational behaviour*, 23(3), 329-345.

Bitsika, V., Sharpley, C. F., & Rubenstein, V. (2010). What stresses university students: An interview investigation of the demands of tertiary studies. *Journal of Psychologists and Counsellors in Schools*, 20(1), 41-54.

Boyacioglu, N., & Kucuk, L. (2011). Irrational beliefs and test anxiety in Turkish school adolescents. *The Journal of School Nursing*, 27(6), 447-454.

Bridges, K. R., & Harnish, R. J. (2010). Role of irrational beliefs in depression and anxiety: a review. *Health, 2*(08), 862.

Campbell-Sills, L., Roy-Byrne, P. P., Craske, M. G., Bystritsky, A., Sullivan, G., & Stein, M. B. (2016). Improving outcomes for patients with medication-resistant anxiety: effects of collaborative care with cognitive behavioral therapy. *Depression and anxiety, 33*(12), 1099-1106.

Caprara, G. V., Fida, R., Vecchione, M., Del Bove, G., Vecchio, G. M., Barbaranelli, C., & Bandura, A. (2008). Longitudinal analysis of the role of perceived self-efficacy for self-regulated learning in academic continuance and achievement. *Journal of educational psychology, 100*(3), 525.

Cartwright-Hatton, S., Roberts, C., Chitsabesan, P., Fothergill, C., & Harrington, R. (2004). Systematic review of the efficacy of cognitive behaviour therapies for childhood and adolescent anxiety disorders. *British journal of clinical psychology, 43*(4), 421-436.

Carver, C. S., & Scheier, M. F. (1988). A control-process perspective on anxiety. *Anxiety Research, 1*(1), 17-22.

Cassady, J. C., & Johnson, R. E. (2002). Cognitive test anxiety and academic performance. *Contemporary educational psychology, 27*(2), 270-295.

Chambless, D. L., & Gillis, M. M. (1993). Cognitive therapy of anxiety disorders. *Journal of consulting and clinical psychology, 61*(2), 248.

Chapell, M. S., Blanding, Z. B., Silverstein, M. E., Takahashi, M., Newman, B., Gubi, A., & McCann, N. (2005). Test anxiety and academic performance in undergraduate and graduate students. *Journal of educational Psychology, 97*(2), 268.

Chemers, M. M., Hu, L. T., & Garcia, B. F. (2001). Academic self-efficacy and first year college student performance and adjustment. *Journal of Educational psychology, 93*(1), 55.

Cheng, C., Cheung, S. F., Chio, J. H. M., & Chan, M. P. S. (2013). Cultural meaning of perceived control: a meta-analysis of locus of control and psychological symptoms across 18 cultural regions.

Chorpita, B. F., & Barlow, D. H. (1998). The development of anxiety: the role of control in the early environment. *Psychological bulletin, 124*(1), 3-21.

Cooke, R., Bewick, B. M., Barkham, M., Bradley, M., & Audin, K. (2006). Measuring, monitoring and managing the psychological well-being of first year university students. *British Journal of Guidance & Counselling, 34*(4), 505-517.

Corrigan, P. W., Watson, A. C., & Barr, L. (2006). The self-stigma of mental illness: Implications for self-esteem and self-efficacy. *Journal of social and clinical psychology, 25*(8), 875.

Craske, M. G., Rauch, S. L., Ursano, R., Prenoveau, J., Pine, D. S., & Zinbarg, R. E. (2009).

What is an anxiety disorder?. *Depression and anxiety*, 26(12), 1066-1085.

Dahlin, M., Joneborg, N., & Runeson, B. (2005). Stress and depression among medical students: A cross-sectional study. *Medical education*, 39(6), 594-604.

Davey, G. C., Hampton, J., Farrell, J., & Davidson, S. (1992). Some characteristics of worrying: Evidence for worrying and anxiety as separate constructs. *Personality and Individual Differences*, 13(2), 133-147.

David, D., Szentagotai, A., Lupu, V., & Cosman, D. (2008). Rational emotive behavior therapy, cognitive therapy, and medication in the treatment of major depressive disorder: a randomized clinical trial, posttreatment outcomes, and six-month follow-up. *Journal of clinical psychology*, 64(6), 728-746.

Davison, G. C., Robins, C., & Johnson, M. K. (1983). Articulated thoughts during simulated situations: A paradigm for studying cognition in emotion and behaviour. *Cognitive Therapy and Research*, 7(1), 17-39.

Davison, G. C., & Zigelboim, V. (1987). Irrational beliefs in the articulated thoughts of college students with social anxiety. *Journal of rational emotive therapy*, 5(4), 238-254.

Deardorff, P. A., Kendall, P. C., Finch Jr, A. J., & Sitarz, A. M. (1977). Empathy, locus of control and anxiety in college students. *Psychological reports*, 40(3_suppl), 1236-1238.

DeBerard, M. S., Spielmans, G., & Julka, D. (2004). Predictors of academic achievement and retention among college freshmen: A longitudinal study. *College student journal*, 38(1), 66-80.

De Ridder, D. T., Lensvelt-Mulders, G., Finkenauer, C., Stok, F. M., & Baumeister, R. F. (2012). Taking stock of self-control: A meta-analysis of how trait self-control relates to a wide range of behaviors. *Personality and Social Psychology Review*, 16(1), 76-99.

DiGiuseppe, R., Leaf, R., Exner, T., & Robin, M. W. (1988). The development of a measure of irrational/rational thinking. In *World Congress of Behaviour Therapy, Edinburgh, Scotland*.

Dilorenzo, T., David, D., & Montgomery, G. H. (2011). The impact of general and specific rational and irrational beliefs on exam distress; A further investigation of the binary model of emotional distress as an emotional regulation model. *Journal of Cognitive & Behavioural Psychotherapies*, 11(2), 121-142.

Drake, R. E., Mueser, K. T., Brunette, M. F., & McHugo, G. J. (2004). A review of treatments for people with severe mental illnesses and co-occurring substance use disorders. *Psychiatric rehabilitation journal*, 27(4), 360.

Dryden, W. (2014). *Rational emotive behaviour therapy: Distinctive features*. Routledge.

Dyrbye, L. N., Thomas, M. R., & Shanafelt, T. D. (2006). Systematic review of depression, anxiety, and other indicators of psychological distress among US and Canadian medical students. *Academic Medicine*, 81(4), 354-373.

Dreisbach, G., & Goschke, T. (2004). How positive affect modulates cognitive control: reduced perseveration at the cost of increased distractibility. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 30(2), 343.

Eisenberg, D., Gollust, S. E., Golberstein, E., & Hefner, J. L. (2007). Prevalence and correlates of depression, anxiety, and suicidality among university students. *American Journal of Orthopsychiatry*, 77(4), 534-542.

Ellis, A., & Harper, R. A. (1961). A guide to rational living.

Eysenck, M. W. (2013). *Anxiety: The cognitive perspective*. Psychology Press.

Fydrich, T., Dowdall, D., & Chambless, D. L. (1992). Reliability and validity of the Beck Anxiety Inventory. *Journal of anxiety disorders*, 6(1), 55-61.

Gallagher, M. W., Bentley, K. H., & Barlow, D. H. (2014). Perceived control and vulnerability to anxiety disorders: A meta-analytic review. *Cognitive Therapy and Research*, 38, 571-584.

Goldfried, M. R., & Sobocinski, D. (1975). Effect of irrational beliefs on emotional arousal. *Journal of Consulting and Clinical Psychology*, 43(4), 504.

Haycock, L. A., McCarthy, P., & Skay, C. L. (1998). Procrastination in college students: The role of self-efficacy and anxiety. *Journal of counseling & development*, 76(3), 317-324.

Himle, D. P., Thyer, B. A., & Papsdorf, J. D. (1982). Relationships between rational beliefs and anxiety. *Cognitive Therapy and Research*, 6(2), 219-223.

Hollnagel, E. (1998). Context, cognition and control. *Co-operative process management, cognition and information technology*, 27-52.

Huberty, T. J. (2009). Test and performance anxiety. *Principal leadership*, 10(1), 12-16.

Hyland, P., & Boduszek, D. (2012). Resolving a difference between cognitive therapy and rational emotive behaviour therapy: Towards the development of an integrated CBT model of psychopathology. *Mental Health Review Journal*, 17(2), 104-116

Inzlicht, M., Bartholow, B. D., & Hirsh, J. B. (2015). Emotional foundations of cognitive control. *Trends in cognitive sciences*, 19(3), 126-132.

Jain, M., & Singh, S. (2015). Locus of control and its relationship with mental health and adjustment among adolescent females. *Journal of Mental Health and Human Behaviour*, 20(1), 16.

Johnson, J. H., & Sarason, I. G. (1978). Life stress, depression and anxiety: Internal-external control as a moderator variable. *Journal of psychosomatic research*, 22(3), 205-208.

Judge, T. A., & Bono, J. E. (2001). A rose by any other name: Are self-esteem, generalized self-efficacy, neuroticism, and locus of control indicators of a common construct?.

Judge, T. A., Erez, A., Bono, J. E., & Thoresen, C. J. (2002). Are measures of self-esteem, neuroticism, locus of control, and generalized self-efficacy indicators of a common core construct?. *Journal of personality and social psychology*, 83(3), 693.

Kargar, M., Tarmizi, R. A., & Bayat, S. (2010). Relationship between mathematical thinking, mathematics anxiety and mathematics attitudes among university students. *Procedia-Social and Behavioural Sciences*, 8, 537-542.

Kaya, S., & Avci, R. (2016). Effects of Cognitive-Behavioural-Theory-Based Skill-Training on University Students' Future Anxiety and Trait Anxiety. *Educational Research*, 66, 281-298.

Kiaei, Y. A., & Reio Jr, T. G. (2014). Goal pursuit and eudaimonic well-being among university students: Metacognition as the mediator. *Behavioural Development Bulletin*, 19(4), 91.

Klassen, R. M., Krawchuk, L. L., & Rajani, S. (2008). Academic procrastination of undergraduates: Low self-efficacy to self-regulate predicts higher levels of procrastination. *Contemporary Educational Psychology*, 33(4), 915-931.

Komarraju, M., & Nadler, D. (2013). Self-efficacy and academic achievement: Why do implicit beliefs, goals, and effort regulation matter?. *Learning and Individual Differences*, 25, 67-72.

Lange, R. V., & Tiggemann, M. (1981). Dimensionality and reliability of the Rotter IE locus of control scale. *Journal of Personality Assessment*, 45(4), 398-406.

Lazarus, R. S. (1984). On the primacy of cognition.

Lazarus, R. S., & Folkman, S. (1984). Coping and adaptation. *The handbook of behavioural medicine*, 282-325.

Luszczynska, A., Gutiérrez-Doña, B., & Schwarzer, R. (2005). General self-efficacy in various domains of human functioning: Evidence from five countries. *International journal of Psychology*, 40(2), 80-89.

Maddux, J. E. (2016). Self-efficacy. In *Interpersonal and Intrapersonal Expectancies* (pp. 55-60). Routledge.

Maddux, J. E., & Kleiman, E. M. (2012). Self-efficacy. *The Wiley Handbook of Positive Clinical Psychology*, 89-101.

Magán, I., Sanz, J., & García-Vera, M. P. (2008). Psychometric properties of a Spanish version of the Beck Anxiety Inventory (BAI) in general population. *The Spanish Journal of Psychology*, 11(2), 626-640.

Malouff, J. M., Schutte, N. S., & McClelland, T. (1992). Examination of the relationship between irrational beliefs and state anxiety. *Personality and Individual Differences*, 13(4), 451-456.

Manne, S., & Glassman, M. (2000). Perceived control, coping efficacy, and avoidance coping as mediators between spousal unsupportive behaviours and psychological distress. *Health Psychology, 19*(2), 155.

Mathews, A., & MacLeod, C. (1985). Selective processing of threat cues in anxiety states. *Behaviour research and therapy, 23*(5), 563-569.

McNally, R. J. (2001). On the scientific status of cognitive appraisal models of anxiety disorder. *Behaviour Research and Therapy, 39*(5), 513-521.

Mennin, D. S., Heimberg, R. G., Turk, C. L., & Fresco, D. M. (2002). Applying an emotion regulation framework to integrative approaches to generalized anxiety disorder. *Clinical Psychology: Science and Practice, 9*(1), 85-90.

Mills, N., Pajares, F., & Herron, C. (2007). Self-efficacy of college intermediate French students: Relation to achievement and motivation. *Language learning, 57*(3), 417-442.

Montgomery, E. C., Kunik, M. E., Wilson, N., Stanley, M. A., & Weiss, B. (2010). Can paraprofessionals deliver cognitive-behavioral therapy to treat anxiety and depressive symptoms?. *Bulletin of the Menninger Clinic, 74*(1), 45-62.

Montgomery, G. H., David, D., DiLorenzo, T. A., & Schnur, J. B. (2007). Response expectancies and irrational beliefs predict exam-related distress. *Journal of Rational-Emotive & Cognitive-Behaviour Therapy, 25*(1), 17-34.

Morton, S., Mergler, A., & Boman, P. (2014). Managing the transition: The role of optimism and self-efficacy for first-year Australian university students. *Journal of Psychologists and Counsellors in Schools, 24*(1), 90-108.

Muran, J. C., Kassinove, H., Ross, S., & Muran, E. (1989). Irrational thinking and negative emotionality in college students and applicants for mental health services. *Journal of Clinical Psychology, 45*(2), 188-193.

Nieuwenhuijsen, K., Verbeek, J. H., de Boer, A. G., Blonk, R. W., & van Dijk, F. J. (2010). Irrational beliefs in employees with an adjustment, a depressive, or an anxiety disorder: a prospective cohort study. *Journal of Rational-Emotive & Cognitive-Behaviour Therapy, 28*(2), 57-72.

Norton, P. J., & Price, E. C. (2007). A meta-analytic review of adult cognitive-behavioural treatment outcome across the anxiety disorders. *The Journal of nervous and mental disease, 195*(6), 521-531.

Ong, A. D., Bergeman, C. S., & Bisconti, T. L. (2005). Unique effects of daily perceived control on anxiety symptomatology during conjugal bereavement. *Personality and Individual Differences, 38*(5), 1057-1067.

Osman, A., Hoffman, J., Barrios, F. X., Kopper, B. A., Breitenstein, J. L., & Hahn, S. K. (2002). Factor structure, reliability, and validity of the Beck Anxiety Inventory in adolescent psychiatric inpatients. *Journal of Clinical Psychology, 58*(4), 443-456.

Otto, M. W., Smits, J. A., & Reese, H. E. (2004). Cognitive-behavioural therapy for the treatment of anxiety disorders. *The Journal of clinical psychiatry*.

Ovuga, E., Boardman, J., & Wasserman, D. (2006). Undergraduate student mental health at Makerere University, Uganda. *World Psychiatry*, 5(1), 51.

Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of educational research*, 66(4), 543-578.

Pajares, F. (2003). Self-efficacy beliefs, motivation, and achievement in writing: A review of the literature. *Reading & Writing Quarterly*, 19(2), 139-158.

Pekrun, R., Goetz, T., Titz, W., & Perry, R. P. (2002). Academic emotions in students' self-regulated learning and achievement: A program of qualitative and quantitative research. *Educational psychologist*, 37(2), 91-105.

Pilkington, K., Kirkwood, G., Rampes, H., Cummings, M., & Richardson, J. (2007). Acupuncture for anxiety and anxiety disorders—a systematic literature review. *Acupuncture in Medicine*, 25(1-2), 1-10.

Pritchard, M. E., & Wilson, G. S. (2003). Using emotional and social factors to predict student success. *Journal of college student development*, 44(1), 18-28.

Rana, R., & Mahmood, N. (2010). The relationship between test anxiety and academic achievement.

Rajabi, G. R. (2006). Reliability and validity of the general self-efficacy beliefs scale (gse-10) comparing the psychology students of shahid chamrin university and azad university of marvdasht.

Reeve, J., & Jang, H. (2006). What teachers say and do to support students' autonomy during a learning activity. *Journal of educational psychology*, 98(1), 209.

Regehr, C., Glancy, D., & Pitts, A. (2013). Interventions to reduce stress in university students: A review and meta-analysis. *Journal of affective disorders*, 148(1), 1-11.

Richardson, M., Abraham, C., & Bond, R. (2012). Psychological correlates of university students' academic performance: A systematic review and meta-analysis. *Psychological bulletin*, 138(2), 353.

Robinson, O. J., Vytal, K., Cornwell, B. R., & Grillon, C. (2013). The impact of anxiety upon cognition: perspectives from human threat of shock studies. *Frontiers in Human Neuroscience*, 7, 203.

Roddenberry, A., & Renk, K. (2010). Locus of control and self-efficacy: potential mediators of stress, illness, and utilization of health services in college students. *Child Psychiatry & Human Development*, 41(4), 353-370.

Rodgers, L. S., & Tennison, L. R. (2009). A preliminary assessment of adjustment disorder among first-year college students. *Archives of Psychiatric Nursing, 23*(3), 220-230.

Romainville, M. (1994). Awareness of cognitive strategies: The relationship between university students' metacognition and their performance. *Studies in Higher Education, 19*(3), 359-366.

Ross, C. E., & Mirowsky, J. (2013). The sense of personal control: Social structural causes and emotional consequences. In *Handbook of the sociology of mental health* (pp. 379-402). Springer, Dordrecht.

Rotter, J. B. (1966). Generalized expectancies for internal versus external control of reinforcement. *Psychological monographs: General and applied, 80*(1), 1.

Rotter, J. B. (1971). Locus of control scale. *Psychology Today, 42*.

Roy-Byrne, P., Craske, M. G., Sullivan, G., Rose, R. D., Edlund, M. J., Lang, A. J., ... & Campbell-Sills, L. (2010). Delivery of evidence-based treatment for multiple anxiety disorders in primary care: a randomized controlled trial. *Jama, 303*(19), 1921-1928.

Sam, H. K., Othman, A. E. A., & Nordin, Z. S. (2005). Computer self-efficacy, computer anxiety, and attitudes toward the Internet: A study among undergraduates in Unimas. *Journal of Educational Technology & Society, 8*(4).

Schwarzer, R. (Ed.). (2013). *Self-related cognitions in anxiety and motivation*. Psychology Press.

Schwarzer, R., & Jerusalem, M. (1995). Optimistic self-beliefs as a resource factor in coping with stress. In *Extreme stress and communities: Impact and intervention* (pp. 159-177).

Springer, Dordrecht.

Sherer, M., Maddux, J. E., Mercandante, B., Prentice-Dunn, S., Jacobs, B., & Rogers, R. W. (1982). The self-efficacy scale: Construction and validation. *Psychological reports*, *51*(2), 663-671.

Skinner, E. A. (1996). A guide to constructs of control. *Journal of personality and social psychology*, *71*(3), 549.

Somers, J. M., Goldner, E. M., Waraich, P., & Hsu, L. (2006). Prevalence and incidence studies of anxiety disorders: a systematic review of the literature. *The Canadian Journal of Psychiatry*, *51*(2), 100-113.

Soysa, C. K., & Wilcomb, C. J. (2015). Mindfulness, self-compassion, self-efficacy, and gender as predictors of depression, anxiety, stress, and well-being. *Mindfulness*, *6*(2), 217-226.

Spielberger, C. D. (Ed.). (2013). *Anxiety: Current trends in theory and research*. Elsevier.

Spielberger, C. D. (2010). *State-Trait anxiety inventory*. John Wiley & Sons, Inc.

Spielberger, C. D., & Reheiser, E. C. (2009). Assessment of emotions: Anxiety, anger, depression, and curiosity. *Applied Psychology: Health and Well-Being*, 1(3), 271-302.

Spielberger, C. D., Gonzalez-Reigosa, F., Martinez-Urrutia, A., Natalicio, L. F., & Natalicio, D. S. (2017). The state-trait anxiety inventory. *Revista Interamericana de Psicología/Interamerican Journal of Psychology*, 5(3 & 4).

Stallman, H. M. (2008). Prevalence of psychological distress in university students: Implications for service delivery. *Australian Family Physician*, 37, 673-677.

Stallman, H. M. (2010). Psychological distress in university students: A comparison with general population data. *Australian Psychologist*, 45(4), 249-257.

Sternberg, R. J., & Ben-Zeev, T. (2001). *Complex cognition: The psychology of human thought*. Oxford University Press.

Takebayashi, Y., Tanaka, K., Sugiura, Y., & Sugiura, T. (2017). Well-Being and Generalized Anxiety in Japanese Undergraduates: A Prospective Cohort Study. *Journal of Happiness Studies*, 1-21.

Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of personality*, 72(2), 271-324.

Tate, K. A., Fouad, N. A., Marks, L. R., Young, G., Guzman, E., & Williams, E. G. (2015). Underrepresented first-generation, low-income college students' pursuit of a graduate education: Investigating the influence of self-efficacy, coping efficacy, and family influence. *Journal of Career Assessment, 23*(3), 427-441.

Thompson, S. C., Sobolew-Shubin, A., Galbraith, M. E., Schwankovsky, L., & Cruzen, D. (1993). Maintaining perceptions of control: Finding perceived control in low-control circumstances. *Journal of personality and social psychology, 64*(2), 293.

Tong, Y., & Song, S. (2004). A study on general self-efficacy and subjective well-being of low SES-college students in a Chinese university. *College Student Journal, 38*(4), 637-643.

Trainin, G., & Swanson, H. L. (2005). Cognition, metacognition, and achievement of college students with learning disabilities. *Learning Disability Quarterly, 28*(4), 261-272.

Turner, E. A., Chandler, M., & Heffer, R. W. (2009). The influence of parenting styles, achievement motivation, and self-efficacy on academic performance in college students. *Journal of college student development, 50*(3), 337-346.

Twenge, J. M., Zhang, L., & Im, C. (2004). It's beyond my control: A cross-temporal meta-analysis of increasing externality in locus of control, 1960-2002. *Personality and Social Psychology Review, 8*(3), 308-319.

Van Dinther, M., Dochy, F., & Segers, M. (2011). Factors affecting students' self-efficacy in higher education. *Educational research review, 6*(2), 95-108.

Višlá, A., Flückiger, C., Grosse Holtforth, M., & David, D. (2016). Irrational beliefs and psychological distress: A meta-analysis. *Psychotherapy and psychosomatics*, 85(1), 8-15.

Vitasari, P., Wahab, M. N. A., Othman, A., Herawan, T., & Sinnadurai, S. K. (2010). The relationship between study anxiety and academic performance among engineering students. *Procedia-Social and Behavioural Sciences*, 8, 490-497.

Wang, Q., Bowling, N. A., & Eschleman, K. J. (2010). A meta-analytic examination of work and general locus of control.

Watson, D. (1967). Relationship between locus of control and anxiety. *Journal of Personality and Social Psychology*, 6(1), 91.

Wetherell, J. L., & Gatz, M. (2005). The Beck Anxiety Inventory in older adults with generalized anxiety disorder. *Journal of Psychopathology and Behavioural Assessment*, 27(1), 17-24.

Wong, S. S. (2008). The relations of cognitive triad, dysfunctional attitudes, automatic thoughts, and irrational beliefs with test anxiety. *Current Psychology*, 27(3), 177-191.

Wong, T. W., Gao, Y., & Tam, W. W. S. (2007). Anxiety among university students during the SARS epidemic in Hong Kong. *Stress and health*, 23(1), 31-35.

YU, P., & SU, S. H. (2005). LI LiDepartment of Psychology, Qufu Normal University, Shandong 273165, China; The Relationships between College Students' Attributional style, Self-efficacy and Subjective Well-being [J]. *Chinese Journal of Clinical Psychology*, 1.

Appendices

Appendix 1

Information Sheet

My name is Naomi Clifford and I am currently in my final year studying BA Honours in Psychology at the National College of Ireland. I am conducting this research as part of my final year undergraduate thesis. This thesis will investigate the effect locus of control, irrational beliefs and self-efficacy have on anxiety levels of university students.

This form is to invite you to take part in my study. This study involves answering four questionnaires. These questionnaires will include questions and statements that will relate to your anxiety, locus of control, self-esteem and self-efficacy levels. This study will take approximately ten minutes to complete.

The aim of this study is to help to provide a better understanding of the psychological factors that influence anxiety of undergraduate students. To take part in this study is **voluntary** and you are free to withdraw from this study at any point. All information gathered will remain completely anonymous and confidential.

If you have any questions in relation to this study or would like any information please feel free to contact me. If you would like to take part in this study please contact myself at 15586423@student.ncirl.ie

On completion of this study if you have any worries or concerns regarding any negative feeling emotions or thoughts that have come up for you during this below is a phone number for Mental Health Ireland. Please feel free to contact them at any time if you feel it necessary or please feel free to contact myself.

Mental Health Ireland Contact: (01)2841166 info@mentalhealthireland.ie

Thank you for taking the time to read this and for participating in this study.
Naomi Clifford.

Appendix 2

Consent Form

Title of Project: To investigate the effect locus of control, irrational beliefs and self-efficacy have on anxiety levels of university students

Named Researcher: Naomi Clifford

Name: Naomi Clifford

College Email: 15586423@student.ncirl.ie

Clarification of the purpose of the research

The primary aim of this research is to investigate whether locus of control, self-esteem and self-efficacy are contributory factors between high and low levels of anxiety in university students.

Participant – please complete the following

Have you read or had read to you the Information sheet	Yes	No
Do you understand the information provided?	Yes	No
Have you had an opportunity to ask questions and discuss this study?	Yes	No
Have you received satisfactory answers to all your questions?	Yes	No

Conformation that involvement in the Research Study is voluntary

I have read, or had read to me, this consent form. I have had opportunity to ask questions about the consent form and all the questions have been answered to my satisfaction. I freely and voluntarily agree to be part of this research study, which respect my legal and ethical rights. I am aware that I may withdraw at any time, without giving reason, and without this decision affecting me in any way. I have received a plain language statement.

Yes ____ No ____

Advice as to arrangements to be made to protect confidentiality of data, including that confidentiality of information provided is subject to legal limitations.

My identity and other personal information will not be revealed, published or used in further studies. All information will have my name and address removed to protect confidentiality. Any other information that may identify me will also be removed. Confidentiality is assured but I am aware that confidentiality of information provided can only be protected within the limitations of the law. It is possible for data to be subject to subpoena, freedom of information claim or mandated reporting by some professions.

Signature:

I have read and understood the information in this form. My questions and concerns have been answered by the researchers, and I have a copy of this consent form.

Therefore, I consent to take part in this research project

Participants Signature:
Name in Block Capitals:
Witness:
Date:

Appendix 3

Demographics

Gender: Male _____ Female _____

Age: _____

Are you in university? Yes _____ No _____

Number of years you have been in college?

- 1
- 2
- 3
- 4
- 5
- Other

Appendix 4

Beck Anxiety Inventory (BAI)

Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by that symptom during the past month, including today, by circling the number in the corresponding space in the column next to each symptom.

	Not At All	Mildly but it didn't bother me much	Moderately - it wasn't pleasant at times	Severely – it bothered me a lot
Numbness or tingling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feeling hot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wobbliness in legs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unable to relax	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fear of worst happening	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dizzy or lightheaded	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Heart pounding/racing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Unsteady	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Terrified or afraid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nervous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feeling of choking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hands trembling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shaky / unsteady	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fear of losing control	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Difficulty in breathing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fear of dying	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Scared Indigestion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Faint / lightheaded	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Face flushed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hot/cold sweats	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix 5

Rotter's Locus of Control Scale

Here are 29 statements made up of A and B. For each of these select the statement that you agree with the most either A or B.

1. **A.** Children get into trouble because their parents punish them too much.
B. The trouble with most children nowadays is that their parents are too easy with them.
2. **A.** Many of the unhappy things in people's lives are partly due to bad luck.
B. People's misfortunes result from the mistakes they make.
3. **A.** One of the major reasons why we have wars is because people don't take enough interest in politics
B. There will always be wars, no matter how hard people try to prevent them.
4. **A.** In the long run people get the respect they deserve in this world
B. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries
5. **A.** The idea that teachers are unfair to students is nonsense.
B. Most students don't realize the extent to which their grades are influenced by accidental happenings
6. **A.** Without the right breaks one cannot be an effective leader.
B. Capable people who fail to become leaders have not taken advantage of their opportunities
7. **A.** No matter how hard you try some people just don't like you.
B. People who can't get others to like them don't understand how to get along with others.
8. **A.** Heredity plays the major role in determining one's personality
B. It is one's experiences in life which determine what they're like.
9. **A.** I have often found that what is going to happen will happen.
B. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action
10. **A.** In the case of the well-prepared student there is rarely if ever such a thing as an unfair test
B. Many times exam questions tend to be so unrelated to course work that studying is useless
11. **A.** Becoming a success is a matter of hard work, luck has little or nothing to do with it.
B. Getting a good job depends mainly on being in the right place at the right time.
12. **A.** The average citizen can have an influence in government decisions.
B. This world is run by the few people in power, and there is not much the little guy can do about it

- 13. A.** When I make plans, I am almost certain that I can make them work.
B. It is not always wise to plan too far ahead because many things turn out to- be a matter of good or bad fortune anyway
- 14. A.** There are certain people who are just no good.
B. There is some good in everybody.
- 15. A.** In my case getting what I want has little or nothing to do with luck.
B. Many times we might just as well decide what to do by flipping a coin.
- 16. A.** Who gets to be the boss often depends on who was lucky enough to be in the right place first
B. Getting people to do the right thing depends upon ability. Luck has little or nothing to do with it
- 17. A.** As far as world affairs are concerned, most of us are the victims of forces we can neither understand or control
B. By taking an active part in political and social affairs the people can control world events
- 18. A.** Most people don't realize the extent to which their lives are controlled by accidental happenings
B. There really is no such thing as "luck."
- 19. A.** One should always be willing to admit mistakes.
B. It is usually best to cover up one's mistakes.
- 20. A.** It is hard to know whether or not a person really likes you.
B. How many friends you have depends upon how nice a person you are.
- 21. A.** In the long run the bad things that happen to us are balanced by the good ones.
B. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.
- 22. A.** With enough effort, we can wipe out political corruption.
B. It is difficult for people to have much control over the things politicians do in office.
- 23. A.** Sometimes I can't understand how teachers arrive at the grades they give.
B. There is a direct connection between how hard I study and the grades I get.
- 24. A.** A good leader expects people to decide for themselves what they should do.
B. A good leader makes it clear to everybody what their jobs are.
- 25. A.** Many times, I feel that I have little influence over the things that happen to me.
B. It is impossible for me to believe that chance or luck plays an important role in my life.
- 26. A.** People are lonely because they don't try to be friendly.
B. There's not much use in trying too hard to please people, if they like you, they like you.

- 27. A.** There is too much emphasis on athletics in high school.
B. Team sports are an excellent way to build character.
- 28. A.** What happens to me is my own doing.
B. Sometimes I feel that I don't have enough control over the direction my life is taking.
- 29. A.** Most of the time I can't understand why politicians behave the way they do.
B. In the long run the people are responsible for bad government on a national as well as on a local level

Appendix 6

General Self-Efficacy Scale

Here are ten statements about yourself that might be true or not true. Below is a scale from 1-4 please indicate which of these statements you agree with using this scale:

1. Not at all
2. Barely True
3. Moderately True
4. Exactly True

1. ____ I can always manage to solve difficult problems if I try hard enough
2. ____ I someone opposes me, I can find the means and ways to get what I want
3. ____ It is easy for me to stick to my aims and accomplish my goals.
4. ____ I am confident that I could deal efficiently with unexpected events.
5. ____ Thanks to my resourcefulness, I know how to handle unforeseen situations
6. ____ I can solve most problems if I invest the necessary effort.
7. ____ I can remain calm when facing difficulties because I can rely on my coping abilities.
8. ____ When I am confronted with a problem, I can usually find several solutions.
9. ____ If I am in trouble, I can usually think of a solution.
10. ____ I can usually handle whatever comes my way.

Appendix 7

Irrational Thinking Scale

Using the following scale, indicate in the space provided how true each of these statements are for you.

1. Strongly Agree
2. Somewhat Agree
3. Somewhat Disagree
4. Strongly Disagree

1. _____ I absolutely must get a good grade on this exam.
2. _____ It will be awful if I don't get a good grade on this exam.
3. _____ If I don't get a good grade on this exam, I am not worthwhile.
4. _____ If I don't get a good grade on this exam, I won't be able to stand it.