THE APPLICATION OF THE REHABILITATION MODULE FOR ACADEMIC ACHIEVEMENT AMONG TECHNICAL COLLEGE STUDENTS OF PAHANG SKILLS DEVELOPMENT CENTER

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We certify that the thesis is entitled " The Application Of The Rehabilitation Module For Academic Achievement Among Technical College Students Of Pahang Skills Development Center" written by Roshasliza Binti Samat. We have examined the final copy of this thesis and that in our opinion; it is fully adequate in terms of scope and quality for the awarding the degree of Masters of Technology Management. We herewith recommend that it be accepted in fulfillment of the requirements for the degree of Masters of Science specializing in the Technology Management (Human Capital Resources).

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I hereby declare that I have checked this thesis and in my opinion this thesis is satisfactory in terms of scope and quality for the award of the degree of Master of Technology Management.

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I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged. The thesis has not been accepted for any degree and is not concurrently submitted for award of other degree.

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DEDICATION

To my beloved husband,

Fakhrul Anuar bin Abdullah

And Children

Qaisara Aisya Damia and Qairina Amni Damia.

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ABSTRACT

Engineering graduates and technical employees are playing an increasingly significant role in the economic development of Malaysia, especially under its current national economy transformation. How to enhance their related skills has become a heated issue. This research is trying to ascertain the application of rehabilitation module known as MCBE-REBT Module for academic achievement among technical college students that study at PSDC's College. The Treatment Module consists of three techniques which is mental technique, cognitive technique and behavior technique. All the techniques complement each other in health promotion to give a better environment and condition to all technical college students such as stress reduction technique and mind-body control technique. The module facilitate the students to learn self-regulation which is later the student have the ability to control their own behavior. By establishing the MCBE-REBT (Mental, Cognitive, Behavior Technique) Module, the relationship between personality types and academic achievements has been evaluated. The personality types as a part of the module are classified by using Credo Personality Profiling, while the academic achievements are measured in terms of GPA. Also by integrating the Biofeedback Computer Game-based Training into MCBE Techniques, a rehabilitation Module is developed to help the students to learn self-regulation and relaxation technique. Result from Spearman, r_s, correlation matrix of outcome measures improvement (delta changes scores) on the total sample showed that there is no significant correlation between improvement in GPA and biofeedback training as indicated by heart rate reduction. Result of Friedman test shows that the heart rate of subjects receiving biofeedback training significantly reduced from pre to post intervention (χ^2 (2) = 8.667, p = 0.011).Therefore, it shows that by practicing the REBT_MECB Module the students can learn the skills of relaxation and will be ready to manage their emotions, and good in self-regulation whenever facing stress and anxiety.

ABSTRAK

Graduan lulusan kejuruteraan dan pekerja teknikal memainkan peranan yang semakin penting dalam pembangunan ekonomi Malaysia terutama dalam menjayakan Program Transformasi Ekonomi Negara. Bagaimana meningkatkan kemahiran mereka telah menjadi isu utama yang diperbincangkan. Penyelidikan ini cuba untuk melihat penggunaan modul pemulihan yang dikenali sebagai Modul MCBE REBT di kalangan pelajar kolej teknikal di Kolej PSDC dari segi pencapaian akademik. Modul ini terdiri daripada tiga teknik iaitu teknik mental, teknik kognitif dan teknik tingkah laku. Ketiga-tiga teknik adalah saling melengkapi antara satu sama lain dalam meningkatkan kesihatan bagi memberikan persekitaran dan keadaan yang lebih baik kepada semua pelajar kolej teknikal seperti teknik pengurangan tekanan dan teknik kawalan minda dan badan. Modul ini membantu pelajar untuk belajar kawalan kendiri yang kemudian pelajar mempunyai keupayaan untuk mengawal kelakuan sendiri. Melalui modul MCBE-REBT (mental, Kognitif dan Tingkahlaku), hubungan antara jenis personaliti dan pencapaian akademik juga telah dinilai. Jenis-jenis personaliti iaitu sebahagian daripada modul dikelaskan dengan menggunakan Profail Personaliti Credo, manakala pencapaian akademik diukur dari segi PNG. Selain itu, pelajar juga dilatih untuk kawalan pembangunan kendiri dan teknik kawalan dalaman melalui latihan berasaskan Permainan Komputer Biofeedback. Keputusan dari Spearman rs, korelasi matriks peningkatan hasil ujian (perubahan delta markah) pada jumlah sampel menunjukkan bahawa tiada hubungan yang signifikan antara peningkatan dalam PNG dan latihan biofeedback seperti yang ditunjukkan oleh pengurangan kadar degupan jantung. Keputusan ujian Friedman menunjukkan bahawa kadar jantung pelajar yang menerima latihan biofeedback semakin berkurangan dari mula hingga akhir latihan ($\chi 2$ (2) = 8.667, p = 0.011). Oleh itu, ia menunjukkan bahawa dengan mengaplikasikan Modul MECB- REBT pelajar boleh mempelajari kemahiran menghadapi tekanan dan akan bersedia untuk mengurus emosi mereka serta secara tidak langsung berupaya dalam pengawalseliaan diri apabila menghadapi tekanan dan kebimbangan

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LIST OF ABBREVIATIONS

CPP	Credo Personality Profiling
MECB	Mental, Cognitive, Behavior and Emotion
GPA	Grade Point Average
REBT	Rational Emotive Behavior Therapy
CBT	Cognitive-Behavioral Therapy

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Malaysia is gearing towards high income economy by the year 2020. The Government will realise its aims to transform the nation into a developed and high-income economy through inclusive, balanced and sustainable development. Towards this, continuous priority will be given to nurture highly skilled human-capital. Technical Education and Vocational Training (TEVT) is being given as much importance as the more traditional academic pathway of tertiary education under the 10 Malaysia Plan. The plan states that enrolment in TEVT must be significantly increased to upskill the workforce in order for Malaysia to become a high-income economy. The 2011 Budget complements and reinforces the New Economic Model (NEM) and the 10th Malaysia Plan (10MP) of the government by giving high priority to human capital development (HCD) as a cornerstone of the Economic Transformation Programme (ETP).

Institutions of higher learning in Malaysia provide opportunities to equip individuals with knowledge, skills and professionalism to meet the need of national human resources for the national development. The public and private institutions play important roles to fulfill the national needs. Therefore, good technical and vocational education is one of the factors in the development of a country. In fact, Prime Minister Datuk Seri Najib Tun Razak when tabling the 10MP, said technical education and vocational training were the preferred choices for students expecting good career prospects in developed countries..

Recent years, Malaysia government is aiming to transform the country into a developed, high-income economy through inclusive, balanced and sustainable development. To achieve this goal, some authoritative statistics show that Malaysia needs at least 3.3million skilled manpower in the next 10 years. Consequently, continuous priority is now being given to nurture highly skilled human-capital. A large amount of RM60 million is allocated to further intensify the Industrial Skill Enhancement Programme in State Skills Development Training Centres which is supposed to enhance the skills of engineering graduates and technical employees in line with market requirements *(http://www.nst.com.my/nst/articles/FulltextofPM__8217_sBudget2011speech/Article/).*

In line with the objective to develop high quality human capital, the government will allocate RM1.3 billion for management and upgrading of polytechnics and community colleges as well as provide an education loan fund to benefit 32,000 students. Continuous efforts will be taken to train and improve the skills of the workforce to meet market demand. The quality of the workforce will be enhanced through education and appropriate training. Instead of that the government also provide RM438 million to Institut Kemahiran Mara and Kolej Kemahiran Tinggi Mara as well as Institut Kemahiran Belia Negara and Institut Kemahiran Tinggi Belia Negara for training and upgrading (*http://www.treasury.gov.my/pdf/budget/bs10.pdf*)

The issue is that whether these institutions are able to produce excellent human capital to cater for the needs of the nations. The performance of the trainees from these institution as well as from others skills training providers need to be taken care of in the development of highly skilled human capital.

1.2 RESEARCH BACKGROUND

There are so many factors that affect academic performance of a technical college students weather they can success of fail in their study. Existing research identifies several variables that are consistently related to student success. Kuh and Hu (2001) highlighted student engagement with faculty; Pike and Kuh (2005) described environmental and

instructional variables, such as collaborative practices in and out of the classroom, as important correlates of students' success; and Pascarella, Pierson, Wolniak, and Terenzini (2004) conducted a longitudinal study that showed clear advantage for students who have at least one parent who attended college. Pike and Kuh (2005) also found evidence of the supportive impact of second generation status among college students. Undoubtedly there are cognitive, metacognitive, personality and demographic variables that are associated with student success. Fazey and Fazey (2001) are among the researchers who looked at some of these factors and predicted better academic outcomes for students who are motivated and who have a perceived internal locus of control. Other studies show gender differences in likelihood of success in college.

Ballentine (2010) presented that students with poor mental health can experience problems related to adjusting to college in their first-year and beyond. Being away from home and having to make decisions for the first time can lead some students to feel so overwhelmed that they are unable to cope. The loneliness and isolation that often accompany mental health problems like depression can result in interpersonal problems that make it difficult for some students to relate to others. Stress is another factor that can affect an individual's persistence in higher education. Students who have better stress management skills are more successful in college, as stress has a negative influence on academic performance (Zajacova, Lynch, & Espenshade, 2005). It is also important for students who are transitioning to college to take care of themselves physically. Illness or lack of fitness may contribute negatively to academic performance (Zhang & RiCharde, 1998). The connection between the mind and body has been written about for centuries (Myers & Sweeney, 2005).

Cognitive abilities are widely acknowledged as a key predictor of academic success (Ackerman & Heggestad, 1997). However, other non-cognitive, individual differences factors are also thought to play a key role in student learning, including personality traits and approaches to learning (Duff, Boyle, Dunleavy, & Ferguson, 2004; Farsides & Woodfield, 2003). Currently, researchers' attempts to define academic achievement as grade point average or SAT score in a longitudinal manner have gained momentum

(DeBerard, Spielmans, & Julka, 2004; Yeo & Neal, 2004) . Grade Point Average (GPA) is the cumulative numerical value on a 4- point scale of an individual's academic performance in higher education. It is universally recognized as an indicator of future academic achievement and can directly influence student attrition (Kern et al., 1998).

Nowadays, there is a growing trend in the direction of trying to predict performance in college student, adolescent, and grade-school populations. For example, learning styles assessment in conjunction with personality profiles have been used for tailoring strategies to promote the success of students already enrolled. Interventions targeting the four sources of self-efficacy, that is, mastery experience, vicarious learning or modeling, social persuasion, and somatic or emotional states, have documented effectiveness in improving performance (Burton & Nelson, 2006)

University learning atmosphere is amore divergent, autonomous, lecture style approach and laboratory work (Nuy, 1991). The university students will need to adjust to a new social environment and maintain a high level of academic performance (Ross et. al 1999). Once the transition from high school to college begins, many students may discover that a particular institution does not meet their individual needs. The college experience then begins to overwhelm them, and the student opts to explore other options such as working full time instead of going to college at all. In spite of all of the pre-college factors, one of the strongest predictor of college student success is typically the initial social and academic adjustments the students have to experience at the institution (Tinto, 1993).

1.3 PROBLEM STATEMENT

Many students find that going to college is not easy and it is one of the hard ways. There are many contributing factors that can lead to lack of success. Some are unavoidable, some are, well or just plain irresponsibility. Either way, dropping out of college can count as a substantial loss in the life of a student (Tinto, 1993). Once students get into the thickest of their college schedule, they realize that, despite their new independence, the amount of responsibility that comes with their freedom was not at all what they anticipated. Therefore,

they become burnt-out and discouraged, so they quit whether or not their grades were lacking. The balance of a social life and academics is somewhat difficult for a college student.

These scenarios can be seen everywhere regardless of the type of colleges. This is particularly true to students who are now studying in Pahang Skills Development Center or PSDC where students are seen tend to exhibit less motivation and persistence in academic tasks. They might assume that they were central of the failure and see themselves as less educated. The consequences being decrease in motivation to study. The impact of college failure can cause damage to self-esteem and the consequences can influence an entire lifetime. Quality emotions and feelings may help the students give their best potential in the classroom. The students who are always think negative cannot concentrate for a long time and have more difficulty in reaching their potential than others. If this is happened to PSDC's student it may cause the good student may get the poor result in academic achievement in college even their SPM result is excel. Therefore this research is trying to define the personality or attitude in terms of behavior and address the behaviors that need improvement which suggested treatment. This study attempts to propose a rehabilitation module to help the student to improve their performance by introducing a system of integrating three technique which is mental, cognitive and behavior technique named as MECB-REBT Module.

Enhancing cognitive/intellectual abilities of human learning has been a topic of great interest and considerable research in both education and rehabilitation. In education, computers have seen increased use in the classroom for the instruction of advanced skills such as math and language. In the field of brain injury rehabilitation, clinicians have sought to utilize the computer as a high tech tool in the retraining of impaired cognitive skills (Bracy, Lynch, Sbordone, & Berrol, 1985). Therefore, three related aspects of mental, cognition and behaviour are incorporated in this research. The technology of Biofeedback Computer Games Based Training is used in order to help the technical college students on performance in educational settings. The potential for style to impact on learners' performance in educational settings has widespread recognition amongst writers and

researchers concerning themselves with cognitive and learning style, with research in this area tending to look at the relationships between cognitive/learning style and a number of other constructs/factors (Spicer, 2004).

Cognitive style represents a fundamental aspect of an individual's personality (Curry 1983), with the behaviour that it creates representing a broadly consistent expression of stable personality dimensions that appear early in an individual's life (Kirton 1989). It can be defined as "consistent individual differences in preferred ways of organising and processing information and experience" (Messick 1976: 5). Witkin, Moore, Goodenough, and Cox (1977) posit a similar definition describing cognitive style as individual differences in the way people perceive, think, solve problems, learn and relate to others. Brundage and Mackeracher (1980) see cognitive style as a descriptor of consistent differences between individuals in the way they organise information in response to experience. The importance of the cognitive style concept stems from the recognition that it impacts upon a range of behaviours at the individual level (Struefert and Nogami 1989), and that this ultimately leads to differences in performance in a range of tasks and situations.

Mental, social and behavioural health problems may interact to intensify each other's effects on behaviour and well-being. According to Ballentine (2010), there are many concepts that can be described by the term wellness. These may include people's ability to cope with stressful situations, how they view their contributions to the world (creativity), their self-identity (essential self), their physical well-being, or the amount of support they have from other individuals (social self). Each of these factors can contribute to how individuals function and helps determine their overall level of wellness (Myers & Sweeney, 2005).

Although an optimal level of stress can enhance learning ability (Kaplan & Sadock, 2000), too much stress can cause physical and mental health problems (Niemi & Vainiomaki, 1999), reduce students' self-esteem (Linn & Zeppa, 1984) and may affect students' academic achievement.

At PSDC college, especially the first year, guidance and individual attention from a counselor or mentor may not exist in the student's life. Not knowing where to go, how to deal with problems can lead to most of the factors that being mentioned above and ultimately down the road to a failed college experience. Therefore this research suggests the application of rehabilitation module which is consist of three techniques for academic achievement. The module named as MECB-REBT Module.

The elements of MECB are Mental Technique, Cognitive Technique and Behavior Technique. Mental techniques are designed to help the students to change their negative thoughts by emotional means, such as generating feelings that can help, challenge and change negative thoughts. This technique will use the technology of Biofeedback Computer Games based Training. The Biofeedback computer games being used is VIRA. It is a computer game for preventing and treating of stress-related disorders based on Biofeedback methods. It will help the sample to come to the state of relaxation when all systems of the organism work in the regimen of natural healing. Being experienced in achieving and maintaining of relaxation state, they will easily use the skill acquired at the computer in the real stress situation. Facing any problems, they will be ready to control themselves to manage their emotions.

Cognitive techniques are specific strategies to change or modify unhelpful and/or negative thoughts concerning a particular event. For example, learning to change one's thoughts to cope better with one's depression. Self Help Form is used as an instrument to make the student to think in a more positive and more rational way.

Behavior techniques involve learning practical techniques that help the students to cope in demanding or stressful situations, such as depression and/or loss. Examples include learning how to plan and manage their daily schedule and learning how to distract themselves from negative thoughts. It consist of Credo Personality Profiling, Master Notebook Organization strategy, Working Notebook and Reference Notebook. The Credo Personality Profiling (CPP) was used as the instrument to define personality type of the

sample. CPP is based on over 30 years of research and includes most traits found in other tools, yet groups them into six clusters that relate to the brain's structure.

The CPP lists traits considered positive and essential for success in a work environment and due to this, no one's self esteem is lowered. The traits are also categorized into Temperament, Aptitudes (Talent) and Drives. The validity of CPP is due partly to its strong correlation with several other well known, highly valid profiling tools. It has also been tested against cultural and linguistic norms. Biofeedback Computer Game Based Training is used as a tool of treatment to overcome emotional instability among the students.

1.4 RESEARCH OBJECTIVE

Application of the rehabilitation module named as MCBE-REBT (Mental, Cognitive, Behavior and Emotion- Rational Emotive Behavior Therapy) Academic Performance Module, with the objective to train the student's ability to self-manage emotions and academic performance by using the PSDC's students as sample. This study particularly focus on the factor that relates with mental, cognitive and personality which is more on behavior as conducted by Fazey and Fazey (2001). This factor in line with the development of MCBE-REBT Module where focus on Mental Technique, Cognitive Technique and Behavioral Technique. Meanwhile, this study will try to add in the element of Biofeedback technology which is a form of self-regulation. Through it, individuals can learn to control physiological responses by providing them with an information signal, as sensory feedback, about biological conditions of which they may not be ordinarily aware. Shortly, this study aims to:

1) Develop a rehabilitation module and assess the effect of the module towards academic achievement of technical college students.
2) Assess the effect of biofeedback computer games based training on student's pulse rate performance.
3) Identify type of personality of the students.

1.5 RESEARCH QUESTIONS

MCBE-REBT Academic Performance Module is to train the student's ability to self-manage emotions and academic performance. So can it be expected that this module shall build up the emotional competencies among the students so that they are more capable to learn and perform better academically?

Biofeedback technology is a form of self-regulation training methodology. Through it, individuals can learn to control physiological responses by providing them with an information signal, as sensory feedback, about biological conditions of which they may not be ordinarily aware. So can biofeedback technology such as biofeedback games be integrated into REBT theory to assist Technical College's students to reduce pulse rate performance?

Several studies have examined the relationship between personality and academic performance; can it be used for Technical College's students in Malaysia? Does there exist some difference or similarities?

1.6 SIGNIFICANCE OF RESEARCH

Theoretically, this study shall add one more proof onto the Biofeedback-Performance relationship by testing academic setting. It shall enrich the evaluation model by inducing biofeedback technology. The application of the module may help the students to improve their academic performance and facilitate the students to learn self-regulation which is later the student have the ability to manager control their own behavior. By practicing that method, they have the ability of self-monitoring and self-reinforcement which is also may help in regulating their performance as well as stress reduction behavior.

Practically, this study shall help the student to predict their own trait of personality and to know their strength or weakness, thus to make them more successful, satisfied and productive in doing what comes naturally to themselves. Also this study will help teachers

to enhance their teaching quality by introducing new biofeedback technique that will help the students to manage their emotional response to stress, time management, self-monitoring and organization of course materials.

1.7 SCOPE OF RESEARCH

This research will focus on the application of rehabilitation module which is MECB-REBT Module. This module is based on REBT model which emphasizes positive self-acceptance, critical thinking, the application of the scientific method to self-understanding, and behavioral change. MCBE-REBT Academic Performance Module is to train the student's ability to self-manage emotions and academic performance. The expectation from this module is to build up the emotional competencies among the students so that they are more confident and energetic about their learning abilities.

In this research, two samples of students enrolled Diploma in Electrical Power of Technology and Diploma in Electronic of Technology were selected. Both programmes were franchise program under Universiti Teknologi Malaysia (UTM) and using the Cumulative Grade Point Average (CGPA) as the grading system for academic performance. The information concerning such variables as previous academic record, information related to SPM result and the CGPA result obtained through their personal file kept by Unit Rekod and Kemasukan Pelajar PSDC. Respondents of this research are the students of Pahang Skills Development Centre (PSDC). PSDC has been established for the past 10 years. So far, it has produced more than 12,000 graduates to meet demand for well-trained employees in the industrial sector. It is one of the major players in human capital developments (HCD) of the Economic Transformation Programme (ETP), due to the status as a State Skills Development Training Centres owned by Pahang Darulmakmur State.

The Credo Personality Profiling (CPP) was used as the instrument to define personality type of the sample. CPP is based on over 30 years of research and includes most traits found in other tools, yet groups them into six clusters that relate to the brain's structure.

The CPP lists traits considered positive and essential for success in a work environment and due to this, no one's self esteem is lowered. The traits are also categorized into Temperament, Aptitudes (Talent) and Drives. The validity of CPP is due partly to its strong correlation with several other well known, highly valid profiling tools. It has also been tested against cultural and linguistic norms. Biofeedback Computer Game Based Training is used as a tool of treatment to overcome emotional instability among the students.

This research used Vira Biofeedback Computer Games Based Training and this research focus on pulse rate. Vira, is a parallax-scroller game imitating scuba divers hunting for treasure. By playing the games, the students can analyze their actions during the game that help them choose the most proper individual way of relaxation. By playing the game they reveal new possibilities of behavior under stress conditions, acquire physical sensations of comfort and relaxation. In a real stressing situation the students can use their skill of self-regulation to get relaxed easily.

The focus is to make the students try harder, motivate themselves, set goal, organize their approach to study and perform better in academic. The expected skills from this module will help students successfully meet academic requirements with self-confidence so that they are able to perform well academically and enjoy their learning at college. This module teaches the students a variety of skills to help them manage any stress or emotional instability they might experience. It is also to test applicability of the module in influencing personality in improving academic performance.

1.8 DEFINATION OF TERM

1.8.1 Biofeedback

Biofeedback is defined as a psychophysiologic process in which subtle information is amplified regarding how a person’s body and brain are operating. Through the use of instrumentation, this subtle information is then mirrored back to that person (Dossey, Keegan, Kolkmeier, & Guzzetta,

1989; Fuller, 1977). The basic use of biofeedback is to provide individuals with increased information about what is going on inside their bodies and their brains. The prefix “bio” means life and the word “feedback” means to return information to its origin (Raposa, 2003). The term was coined in the late 1960s to describe laboratory procedures that were being used to train research subjects to alter bodily function, including blood pressure and heart rate, that are not usually controlled voluntarily (Nemours, 2006). Biofeedback is a technique through which individuals can learn to control physiological functions controlled by the autonomic nervous system, by monitoring its status (Sarafino, 1997).

According to Sutarto (2011), biofeedback is a process that enables an individuals to learn how to change physiological activity for the purposes of improving health and performance.

1.8.2 REBT

Rational Emotive Behaviour Therapy (REBT) is based on the concept that emotions and behaviours result from cognitive processes; and that it is possible for human beings to modify such processes to achieve different ways of feeling and behaving. REBT is one of a number of therapies that come under the heading ‘cognitive-behavioural’ (Froggatt, 2005). The Rational Emotive Behaviour Therapy (REBT) is an action- and results oriented psychotherapy which teaches individuals how to identify their own self-defeating ideas, thoughts, beliefs and actions and replace them with more effective life-enhancing.

1.8.3 Academic Performance

According to Lavin (1965), academic achievement is defined as a multidimensional construct of evaluation on both physical and mental ability in a school setting. Campbell & Lavallee (1993) suggested that academic

achievement is a non-additive function of ability and motivation. From this perspective, high academic achievement is conceptualized as the knowledge and skills that allow an individual to perform successfully and sometimes is referred to as satisfaction and ability to perform, with some degree of both ability and motivation to be expected to occur repeatedly (Campbell et al., 1993).

Achievement is also defined as overall cognitive abilities directed toward goal-oriented behavior and has been studied as dynamic rather than a static criterion. This perhaps is because of the tendency to conduct validation studies across contexts instead of across time (Hofmann, Jacobs, & Baratta, 1993).

Currently, researchers' attempts to define academic achievement as grade point average or SAT score in a longitudinal manner have gained momentum (DeBerard, Spielmans, & Julka, 2004; Yeo & Neal, 2004) . Grade Point Average (GPA) is the cumulative numerical value on a 4- point scale of an individual's academic performance in higher education. It is universally recognized as an indicator of future academic achievement and can directly influence student attrition (Kern et al., 1998).

1.8.4 Personality - Credo Personality Profiling

Credo Personality Profile (CPP) describes personality traits as long term predispositions for behavior. They tend to be strongly influenced by our inherited endowment perhaps as high as 80%. While culture upbringing and nurture can stimulate or reward such behavior, the root cause is more genetic. This is why they tend to endure for life and become a visible predictor or patterns and style of behavior. In the study of personality, traits are any enduring and relatively consistent characteristic of our feelings, thinking and behavior. They comprise: aptitude (talents/intelligences), some motivational drives (or need) and temperament.

By knowing which “cluster of traits” comprise our natural aptitude, drive and temperament, the students can select better studies area that are closely associated with their personality. They may be very strong in some, moderate in many and very weak in a few. Having an insight into those traits that are strong can help them choose a more rewarding career, vocation or profession as well as a deeper understanding of why they are the way they are and why they get along better with some people and less so with others.

1.9 THESIS ORGANIZATION

Chapter 2 reviews the relative literature of Biofeedback, academic achievement, REBT theory, personality type, as well as MECB-REBT Module. The reviews of all these elements establish the theoretical foundation of this research.

Chapter 3 describes the subject, instrumentation, procedures and method of analysis that are used in this study. It also describes the participants in this study, presents materials used for data collection and a general overview of each of the procedures involved in analyzing the data collected as well as methodology with the establishment of MCBE-REBT (Mental, Cognitive, Behavior and Emotion – Rational Emotive Behavior Technique) module for improving academic achievement among technical students

Chapter 4 explains and discusses the findings from the conduction of application the MECB-REBT Module name as rehabilitation module.

Chapter 5 draws some conclusions and proposes recommendations for further work.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter reviews of the literature, contains a review on the definitions of technical education, technical education and academic performance, Biofeedback Computer Games Based Training, Biofeedback and academic performance, REBT Theory and as well as MCBE-REBT Module. The module development focused on understanding of how stress and belief affects the students' body and brain. By practicing relaxation techniques, the students can be trained to control excessive arousal brought on by any stressful situations using MECB-REBT programmed which is consisted of Self Help Form Program, The Master Notebook System -Organization strategies Program and Biofeedback Computer Games Based Training Program. While playing the game, the students have to stay focused and maintain concentration which contributes to better performance. As a result, they achieve better control of psycho-physiological state, effective coping with anxiety and better performance. The students can learn the skills of relaxation and will be ready to control them, manage their emotions, and yet change their undesired behavior. The review of all those elements establishes the theoretical foundation of this research.

2.2 TECHNICAL EDUCATION

The history of technical education in Malaysia has been a century old. Beginning in 1904, a Technical School began its operation on Weld Road (now Jalan Raja Chulan) to teach Technical Assistants for the Federated Malay States Departments of Railways,

Survey and Public Works. Officially known as Treacher Technical School, it was named after Sir William Treacher, the Resident General during that time. Students followed classed on part-time basis, they worked and trained specifically according to the technical needs of their employment.

2.2.1 Academic Performance and Technical Education

Students moving from school to university atmosphere during their transitional period or first year undergraduates would face major changes in their life. For some students, this is a smooth process but however many encounter difficulties (Judy Sheard et.al, 2003). According to Judy Sheard (2003) during this transition period problem faced by these first year undergraduates are they experience high dropout rates, low pass rates and achieve lower grades. According to Pargetter (1995), 40% students were less successful academically in University of Monash. Some of the problem arises from a few factors such as dissatisfaction of the university 23%, 43% were achieving low marks, 30% felt they were not ready to choose a university. Ramsden (2003) writes it is apparent from several studies on transition from school to university and student's early experiences of higher education that the first few weeks of their studies are critical to success.

Fisher (1994) added transitional period was full with stress. According to Fisher (1994) that some of the sources of stress during transitional is leaving home, adjust to social environment and maintain a high level of academic performance (Ross et al, 1999). Increase of stress was evident among first year engineering students. The stress was due to the non-support framework from friends, parents and the old environment itself (Hudd et.al, 2000).

Womble (2003) said stress in their study is also a factor that can bring down the GPA grade among students. Kleijn (1994) added classroom atmosphere, teaching style, and internal factor such as interest, habits, attitudes, motivation, aptitude, self-esteem and self-concept also influence the student's studying in the university. He added learning environment will affect the self-concept and other internal factor of the freshman. Other

factors such as anxiety, study habits and cognition can also affect undergraduates in their study.

The effects of unsuccessful transition from school to university are loss of self-esteem and achieving motivation (Pargetter,1995). This will include not only their self-esteem but also their sense of identity (Braxton, Vesper and Hosseler, 1995).

Wankowski (1991) proposed other contributing factors to academic success within higher education: 1) personal confidence and a feeling of competence in learning; 2) hopeful but realistic projection into the future occupational roles and social roles; 3) emotional stability; 4) temperament towards introversion; 5) relative independence from teachers; and 6) a tacit acceptance of the curricular and work demands arising within the structure of tuition. On the other hand, Wankowski (1991) also pointed out that failure is associated with: 1) lack of personal confidence; 2) fearful and unrealistic projection into the future occupational and social roles; 3) emotional instability (characterized by complete withdrawal or extreme eagerness for participation within the learning situation); 4) temperamental tendency towards extraversion; 5)dependence on teachers and significant others; and 6)feelings of disenchantment and an overt rejection of the curricular and work demands arising from the structure of tuition. Although there is some consistent agreement with these ideas in the literature, there remain many conflicting studies.

2.3 BIOFEEDBACK COMPUTER GAME BASED TRAINING

2.3.1 What is biofeedback?

Biofeedback can be defined as the process in which a subject receives information about his biological state. ScoltStoltz (2000) argued that biofeedback is a controversial treatment. Usually a subject is not aware of his physiological functions, especially those controlled by the autonomic nervous system, such as heart rate and peripheral vasoconstriction. But biofeedback creates an external loop by which a subject can monitor one or more of his physiological states. (O'Hare, 1998). One of the most common is not

realizing when some physiological system is not functioning at the best level for any particular situation. For example, many runners do not use optimal breathing patterns for sustained running. Technologies such as biofeedback help people recognize how a physiological system is functioning and learn to form a habit of controlling the system so it works optimally.

Biofeedback is a relaxation technique that uses electronic equipment to amplify the electrochemical energy produced by body responses. Through conscious awareness, biofeedback provides perceptible information that the student can use to gain voluntary control over various physiological processes, The experimental data to support the feasibility oflearned control of our physiology through biofeedback first appeared in the 1950s (Maricic, and Leang, 2005). With the advent of computers, the technology has become even more powerful.

Biofeedback is a process of displaying involuntary physiological processes, usually by electronic instrumentation, and learning to voluntarily influence those processes by making changes in cognition. Biofeedback is a therapeutic tool to facilitate learning voluntary self-regulation of autonomic functions for improving health and performance. Biofeedback is a coaching and training process which helps people learns how to change patterns of behavior-- physiological response patterns-- to take greater self-responsibility for their health and for their mental, physical, emotional and spiritual functioning. In all biofeedback, some form of technology is used to provide extra information beyond the ability of normal senses about some bodily (physiological) function. The person first uses the information as feedback to increase awareness or consciousness of the changes in the body/mind function. Then, the feedback is used to learn to develop new levels of voluntary self-control over the function.

According to O'Hare (1998), in the last 60 years, psycho physiological research has investigated the relationship between emotional states and physiological states. And he went on to discuss how within the past few decades attempts have been made to affect emotional states and states of consciousness through biofeedback. O'Hare (1998) stated that

within the last eight to ten years biofeedback has been commonly used in almost every practice of psychology, psychiatry, and physical rehabilitation therapy.

In the 1950s, Miller was one of the pioneering psychologists who provided some of the earliest data to support the feasibility of biofeedback (Grolier Encyclopedia, 1998). These early studies were primarily done on animals, but were gradually attempted on humans. These early studies also involved the joining of psychological practices with physiological methods, which were used on patients with medical problems. The findings from these early studies laid the foundation for an increased awareness and need for biofeedback.

Orne (1979), as cited in A Brief History of Biofeedback (1999), used a system similar to biofeedback. He assisted children learning to speak using the feedback response to speech acquisition. Children learn to speak by imitating sounds they have heard. Orne stated the children listen closely to a sound they produce and try to compare to the original sounds made by others. According to him, biofeedback training is considered a feedback system or a method of trial and error supplied with information determining response in an attempt to reach a defined goal. This system agreed with Miller's philosophy of using psychological and physiological methods to examine problems utilizing special instrumentation.

There are many advantages to the use of biofeedback, amongst which relatively low cost for both patient and practitioner is the most obvious one. Schwartz (2003) listed six advantages for patient and three advantages for practitioner who participate in biofeedback therapy. They are as follows:

For patient:

1) Increased awareness of psycho physiological activity, reactivity, and recovery from arousal;
2) Increased self-efficacy and confidence in their self regulation ability;

3) Learning to use the relationships between thoughts and behavior and physiologic functioning;
4) Acceptance of therapies for those persons who resist psychotherapies;
5) Increased interest in developing and applying psycho physiological self regulation with a fresh approach;
6) Provision of safe, effective, and cost efficient no pharmacological therapies.

For practitioner (Schwartz, 2003):

1) A valuable source of diagnostic and therapeutic information;
2) Assessment and documentation of psycho physiological functioning that affects symptoms, including reactivity to stimulation and recovery after stimulation;
3) Assessment and documentation of psycho physiological changes within and across sessions.

Biofeedback Computer Game-Based Training is a system consisting of hardware, software and methodology to enable a user to learn relaxation and self-regulation skills in a stress situation. This game based training has been proved by research in Russian Medical Academy. The software includes a set of specially designed biofeedback games. A special sensor is connected to a personal computer to monitor user's heart rate and record its changes in a stressful situation.

The aim of biofeedback training is to help a technical student learn new ways of responding to stress. By acquiring the skill of voluntary regulation of physiological parameters, a person will be able to keep himself calm in the situation of psycho-emotional loading and resist any emotional outburst. Thus in the course of the training the person develops a system of skills for effectively responding to stressful situations. The experience obtained allows effective coping with situational anxiety and improves performance significantly.

2.3.2 Biofeedback and Academic Performance

Over the past 50 years, researchers have used biofeedback to do everything from helping people relax to treating severe headaches, chronic pain, and high blood pressure. Currently, biofeedback has been applied in wider areas, not only for clinical purposes but also for the enhancement of sport, academic, and work performance. With respect to educational purpose, over 30 years ago, Joe Kamiya (1979) wrote: “The potential role of biofeedback in education is unique. Whereas other modes of education are basically addresses to the individual development of interaction skills and coping abilities with the external environment, biofeedback is a way to help the individual cope with the internal. Through biofeedback training an individual first gains awareness of the physiological processes occurring within the body and learns to consciously control those processes. Specifically, the individual is trained to modulate the symptoms of stress and anxiety which lead to better functioning for the individual.

In pediatrics application, researchers have found that biofeedback can help children with learning difficulties such as dyslexia, poor handwriting, and performance anxiety (Carter and Russel, 1980; Linden, Habib, and Radojevic, 1996). The use of biofeedback as academic performance improvement for all ages has been also successful applied in some countries such as Israel, Rusia, and U.S (Smetankin, 2007; McCraty, 2003;Ratanasiripong, et. al, 2010; Seeand Czerlinsky, 1990). Thus, biofeedback has great promise as an intervention in a variety of educational settings and is an ideal tool for enhancing physical, attentional, and social regulation skills.

One of application in education setting has been done by Sprague (1977) who found that respiration biofeedback significantly lowered test-anxiety among college students. This type of biofeedback was also more effective as a treatment for test-anxiety than did study skills training. Furthermore, extensive researches have been conducted by the Heart Math Institute on the use of HRV biofeedback termed psychophysiological coherence. A combination of rhythmic breathing and the intentional self-induction of a sincere positive emotional state facilitate coherence in the autonomic nervous system. When heart-brain

dynamics are modified in this way, the brain's information processing capabilities may change. These changes lead to potential improvement in faculties such as motor skills, focused attention, and discrimination (McCraty, 2003). Therefore, HeartMath has developed tools that have recently been incorporated in an educational curriculum known as TestEdge, which focuses specifically on reducing test anxiety and improving test performance. This program has been introduced at the elementary, middle school, high school, and college levels across the U.S. and has been demonstrated to improve emotional well-being, classroom behaviors, learning, and academic performance. Pilot studies with high school students have shown a 14% to 35% increase in standardized test scores in reading and math after 8 hours of training (over a 3-week period) with this technique (McCraty, et al., 2000). Considering all the above reasons, it is expected that biofeedback will be also effective for improving academic performance among technical college students.

2.4 REBT THEORY

REBT is the first form of cognitive behavior therapy (CBT) and was created by Dr. Albert Ellis in 1955. According to REBT, people experience undesirable activating events, about which they have rational beliefs (RBs) and irrational beliefs (IBs). These beliefs then lead to emotional, behavioral, and cognitive consequences. RBs lead to functional consequences, while IBs lead to dysfunctional consequences. Clients who engage in REBT are encouraged to actively dispute their IBs and to assimilate more efficient, adaptive RBs with a positive impact on their emotional, cognitive, and behavioral responses (Ellis, 1962). Thus, REBT is a psychological theory and a treatment consisting of a combination of three different types of techniques (cognitive, behavioral, and emotive) that can be use to help people feel better physically and emotionally, and to engage in healthier behaviors. And because of its effectiveness, short-term nature, and low cost, REBT becomes very popular. And it has been widely accepted that REBT's comprehensive approach works best for individuals desiring a scientific, present-focused, and active treatment for coping with life's difficulties, rather than one which is mystical, historical, and largely passive (Ellis, 1962).

Albert Ellis introduced this approach to counselling and psychotherapy in 1962. This therapy was originally called Rational Psychotherapy but later became Rational Emotive Therapy (RET) and today, it is known as Rational Emotive Behavior Therapy (REBT). REBT focuses on uncovering irrational beliefs which may lead to unhealthy negative emotions and then replacing them with more productive rational alternatives.

REBT opines that human beings are 'basically hedonistic' in nature, in the sense that they strive to remain alive to achieve some degree of happiness. In addition, it also holds that humans are prone to adopting irrational beliefs and behaviors which may stand in the way of their achieving their goals and purposes. Frequently these irrational attitudes or philosophies could take the form of extraneous dogmatic 'musts', 'should', or 'ought'; which may contrast with rational flexible desires, wishes, preferences and wants.

Ellis outlined some assumptions about human nature and the nature and genesis of their unhappiness or emotional disturbances, with profound implications provided.

1) Human beings are uniquely rational as well as irrational. Rational thinking results in effectiveness, happiness and competence while irrational thoughts result in ineffectiveness, unhappiness and incompetence. When a person is thinking rationally, she/he becomes effective, happy and competent. Each individual are responsible for their own emotions and actions.
2) Emotional or psychological disturbance – neurotic behavior – is a result of irrational and illogical thinking. According to Ellis, emotions accompany thinking and thinking is usually biased, prejudiced, highly personalized and irrational. Their harmful emotions and dysfunctional behaviors are the product of their irrational thinking.
3) Irrational thinking originates in the early illogical learning that individuals are biologically disposed towards and that they acquire more specifically from parents and culture. They can learn more realistic views and, with practice, make them a part of themselves. They can experience a deeper

acceptance of themselves and greater satisfactions in life by developing a reality-based perspective.

REBT is a comprehensive approach to psychological treatment that deals not only with the emotional and behavioral aspects of human disturbance, but places a great deal of stress on its thinking component. Human beings are exceptionally complex, and there neither seems to be any simple way in which they become "emotionally disturbed," nor is there a single way in which they can be helped to be less-defeating. Their psychological problems arise from their misperceptions and mistaken cognitions about what they perceive; from their emotional under reactions or overreactions to normal and unusual stimuli; and from their habitually dysfunctional behavior patterns, which enable them to keep repeating non-adjustive responses even when they "know" that they are behaving poorly. This module is designed to counsel the students to maximize their efficiency in studies.

REBT theory mainly focuses on how irrational thoughts affect people to the extent of causing detrimental effects and how these thoughts act as barriers to a happy self fulfilling life, Dryden (2002). Usually, the irrational thoughts held by a person are often congruent with their behaviour as can be reflected in the person's attitude which also has the cognitive, affective and behavioural components similar to those of REBT theory, Cacioppo & Petty (1981). The REBT depression manual/protocol is an evidence-based one, tested in a randomized clinical trial investigating the relative efficacy of rational-emotive behavior therapy (REBT), cognitive therapy (CT), and pharmacotherapy (fluoxetine) in the treatment of 170 outpatients with non-psychotic major depressive disorder (David et al., 2008). Patients were randomly assigned to one of the following: 14 weeks of REBT, 14 weeks of CT, or 14 weeks of pharmacotherapy. The continuous outcome measures used were the Hamilton Rating Scale for Depression (HRSD) and the Beck Depression Inventory (BDI); the categorical measure was SCID. In the REBT condition, at 14 weeks, the response rates (HRSD<12) were 65% and the recovery rates (HRSD<7) were 45%. At six-month follow-up, the response rates (HRSD<12) were 75% and the recovery rates (HRSD<7) were 52%. No differences among treatment conditions at posttest were observed. A larger effect of REBT (significant) and CT (no significant) over pharmacotherapy at 6 months follow-up was noted

on the HRSD only (David et al., 2008). Research has found that approximately 75% of patients who undergo REBT will experience an improvement in their depression symptoms.

2.5 MECB-REBT MODULE

The objective of MCBE-REBT Academic Performance Module is to train the student's ability to self-manage emotions and academic performance. The expectation from this module is to build up the emotional competencies among the students so that they are more confident and energetic about their learning abilities. The focus is to make the students try harder, motivate themselves, set goal, organize their approach to study and perform better in academic. The expected skills from this module will help students successfully meet their academic requirements with self-confidence so that they are able to perform better academically and enjoy their learning at college.

MECB is based on REBT model which emphasizes positive self-acceptance, critical thinking, the application of the scientific method to self-understanding, and behavioral change.. The elements of MECB are Mental, Cognitive and Behavior.The structure of the MCBE-REBT academic performance module comprises of three important elements that the students should have as acquired skills.

Mental techniques session will help the students to change their mind attention and focus by using the technology of Biofeedback Computer Games Based Training. It will teach the students to develop a relaxation response by studying signals from their body with the help of sensor. Observation of the user's actual heart rate in real time increases the effectiveness of the self-control skill training.

Cognitive techniques session will help the students to change or modify unhelpful or negative thoughts concerning a particular event. For example, learning to change one's thoughts to cope better with one's depression. Therefore, REBT concept is used as the medium to control their emotion, belief and thoughts when dealing with stress or anxiety. Behavior techniques session involve learning practical techniques that help the students to

cope in demanding or stressful situations, such as depression or loss. Examples include learning how to plan and manage their daily schedule, and learning how to distract themselves from negative thoughts.

Behavior techniques involve learning practical techniques that help the students to cope in demanding or stressful situations, such as depression and stress. Examples of behavioral strategies include learning how to plan and manage their daily schedule, and learning how to distract themselves from negative thoughts.

Behavior Technique session is to make the students more effective and to reduce the students' level of stress by making note of upcoming event and planning; to help the students to structure their days and to keep control of their time and energies over the long haul; to help the students to manage their study time and to learn on how to do a systematic study skill as well as to understand their own personality traits that will help to determine how they will fit with their working environment of intended career field. Educators, researchers, and psychologists have been constantly searching for parsimonious set of variables that predicts patterns of students' behaviors and their relationship to academic achievement, amongst which personality has been recognized as a determining factor on how people learn (Lawrence, 1997; Myer et al, 1998). Many scholars have accepted five-factor model of personality as a replicable and unifying taxonomy of personality (Digman, 1990; Goldberg, 1992) and have found personality traits be significantly related to successful job and school performance, both logically and statistically (Hogan and Hogan, 1989).

The understanding of individual personality traits will help determine how they will fit with their working environment of intended career field. Everybody has her/his own unique talent. This unique talent equips each person with a special ability to do certain kinds of task easily and happily. Inborn abilities are completely different from acquired knowledge, skills and interests. Interest can be changed and also gain new skills and knowledge. But, the natural inherited talent remains with the person, unchanged for the

entire of life. So, the better the understanding of the unique genetic gift, the more likely a person will have a satisfying and successful career (Life Matters, 2005).

The Credo Personality Profiling (CPP) suggests that by knowing strong traits, that person can better understand the behavioral style preference such as communicating, learning, leading, planning, and organizing life, problem solving, making decision and many more. When people are doing something they really enjoy, they get more things done and they do it better. According to Nancy Wilson (2009), researches have indicated a significant correlation between personality traits and academic performance. Students high in conscientiousness and extroversion experience gainedgreater academic success, which is evidenced by their GPAs (Lievens, Coetsier, De Fruyt, & De Maeseneer, 2002; Rau & Durand, 2000; Ridgell&Lounsbury, 2004). Aside from personality traits correlating to academic performance, self-efficacy, that is, the belief in one's ability to perform (Bandura, 1997), can affect a student's motivation to succeed and attain goals. These variables also are related to attrition rates (Higgins, 2005). Higher self-efficacy beliefs can lead to better academic performance (Audia, Locke, & Smith, 2000).

Everybody has her or his own unique talent. This unique talent equips each person with a special ability to do certain kinds of task easily and happily. Inborn abilities are completely different from acquired knowledge, skills and interests. Interest can be changed and also gain new skills and knowledge. But, the natural inherited talent remains with the person, unchanged for the entire of life. So, the better the understanding of the unique genetic gift, the more likely a person will have a satisfying and successful career.

2.6 CONCLUSION

Biofeedback computer game for preventing and treating of stress-related disorders helps the sample to come to the state of relaxation when all systems of the organism work in the regimen of natural healing. Being experienced in achieving and maintaining the relaxation state, they are supposed to easily use the skill acquired at the computer in the real

stress situation. Whenever facing any problems, they will be ready to control themselves to manage their emotions.

Personality theory has not made the inroads in education that it has in organizational and vocational research. However, there has been a definite trend in this area. Among all personality dimensions, conscientiousness has almost invariably been associated with achievement across a wide range of contexts. Personality directly and indirectly affects academic achievement through such mechanisms as learning strategies, time management, and study techniques. The overall consensus is that personality assessments should be part of college admissions criteria. In regard to students admitted technical programs, having knowledge of personality factors can be useful in terms of developing learning strategies and providing intervention when needed.

Biofeedback works by teaching subjects to acquire the skill of voluntary regulation of physiological parameters. As a result, a person will be able to keep himself calm in the situation of psycho-emotional loading and resist any emotional outburst. Currently biofeedback has also gain widespread implementation not only in clinical settings but also in education setting for reducing test-anxiety (Sprague, 1977), and improving academic performance (Smetankin, 2007; McCraty, 2003). Nonetheless, to date, no studies that were reported on the use of biofeedback for improvement of academic performance among technical college students. It is expected that an integration of MCBE-REBT (Mental, Cognitive, Behavior and Emotion – Rational Emotive Behavior Technique) module and biofeedback training will improve academic achievement as indicated by students' GPA.

Thru this rehabilitation module, there has been a shift in the way how the students take care of themselves by responsible for their own physical and spiritual well-being. This module is trying to enhance these efforts at greater self-regulation, wellness and growth. Chapter 3 will describe more on methods of this study as well as procedures of establishment of MCBE-REBT (Mental, Cognitive, Behavior and Emotion – Rational Emotive Behavior Technique) module for improving academic achievement among technical students.

CHAPTER 3

RESEARCH METHODOLOGY AND DATA COLLECTION

3.1 INTRODUCTION

This chapter provides information concerning the subject, instrumentation, procedures and method of analysis used in this study. It explains on how the data was collected and how it was analyzed. It also describes about the participants in this study, materials used for data collection, general overview of each of the procedures involved in analyzing the data collected.

3.2 RESEARCH SAMPLE

For this study, 97 out of 235 college students from PSDC College participated in this research. They are engineering students franchise program with Universiti Teknologi Malaysia (UTM). They are enrolled Diploma in Power Electrical Technology (DME) and Diploma in Electronic Technology (DTE). The samples consisted of 45 females (46%) and 52 males (54%). Their age is range from 19 to 21 years old. Pahang Skills Development Centre or PSDC, as it is known is integrated training institutions that provide quality training programs for industrial workforce besides offering skills-based education training for school leavers that meets industry's requirement. PSDC aim is to be the best training provider in the fields of skills training.

PSDC has been established for the past 10 years. So far, it has produced more than 12,000 graduates to meet demand for well-trained employees in the industrial sector. It is

one of the major players in human capital developments (HCD) of the Economic Transformation Programme (ETP), due to the status as a State Skills Development Training Centres owned by Pahang Darulmakmur State.

In order to accomplish the objective, two samples of students enrolled Diploma in Electrical Power of Technology and Diploma in Electronic of Technology were selected. Both programs were franchise program under UniversitiTeknologi Malaysia (UTM) and using the Cumulative Grade Point Average (CGPA) as the grading system for academic performance. The information concerning such variables as previous academic record, information related to SPM result and the CGPA result obtained through their personal file kept by Unit Rekod and KemasukanPelajar PSDC.

Courses in PSDC College are conducted at the Diploma and Certificate levels to provide flexibility for students to further their studies. Certificate courses are skill-based courses that prepare students for the workplace and also for those who wish to progress on to diploma courses.

Diploma in Power Electrical Technology (DME) and Diploma in Electronic Technology (DTE) were the franchise programmed between PSDC College and University Technology of Malaysia (UTM). It is a technical Diploma course to meet the rising demand from the private sector for trained professional and technical personnel. College PSDC is placed on helping students begin to develop skills and knowledge in technical areas that can have practical value in the workplace and to pursue many opportunities in today's fastest growing career fields. That is why students of DME and DTE from College PSDC are being selected as sample for this study. Details of the research sample for the data as shown in table 3.1.

Table 3.1: Research Sample Data

	Number	Percentage	Range
Male	52	54%	
Female	44	46%	
DME – Semester 1	12	12%	
DME – Semester 2	25	26%	
DME – Semester 3	19	20%	
DME – Semester 4	16	16%	
DTE – Semester 1	10	10%	
DTE – Semester 2	10	10%	
DTE – Semester 4	5	5%	
Age			19-21

3.3 METHODOLOGY

3.3.1 Rehabilitation Module – MCBE-REBT Module

The module being used is based on the Rational Emotive/Cognitive Behavioral Therapy (REBT/CBT) manual. Rational Emotive Behavior Therapy (REBT) is based on the concept that emotions and behaviors result from cognitive processes and that it is possible for human beings to modify such processes to achieve different ways of feeling and behaving. REBT is one of a number of therapies that come under the heading "cognitive-behavioral" (David et al., 2008). This study uses REBT to represent REBT/CBT.

MECB is based on REBT model which emphasizes positive self-acceptance, critical thinking, the application of the scientific method to self-understanding, and behavioral change. The overall REBT treatment is focused on the irrational beliefs mediating depressive symptoms: demandingness (DEM), self-downing (SD), awfulizing (AWF) and low frustration tolerance (LFT). Cognitive (i.e., disputation), behavioral and emotive techniques will be used to change the target irrational beliefs (David et al., 2008). Experiments with the program have shown that the students can be taught to guide their

actions through positive directed thought (David et al., 2008). The elements of MECB is similar to REBT which are Mental Technique, Cognitive Technique and Behavior Technique. The structure of the MCBE-REBT academic performance module comprises of three important elements that the students should have as acquired skills. The elements are seen below with the module structure framework followed in Figure.3.1.

1) Mental Techniques. Mental techniques are designed to help the students to change their negative thoughts by emotional means, such as generating feelings that can help, challenge and change negative thoughts.

2) Cognitive Technique. Cognitive techniques are specific strategies to change or modify unhelpful and/or negative thoughts concerning a particular event. For example, learning to change one's thoughts to cope better with one's depression.

3) Behavioral Techniques. Behavior techniques involve learning practical techniques that help the students to cope in demanding or stressful situations, such as depression and/or loss. Examples include learning how to plan and manage their daily schedule, and learning how to distract themselves from negative thoughts.

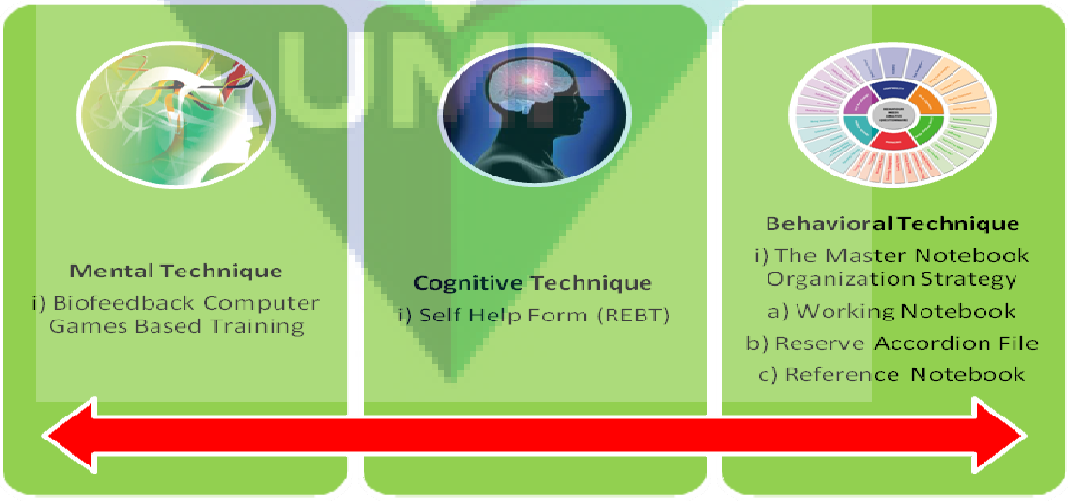

Figure 3.1: MECB-REBT Module Framework

3.3.2 MENTAL TECHNIQUE SESSION- Implementation of Biofeedback Computer Based Training

For this session the student will be given a Biofeedback Computer Based Training to train them mentally and emotionally in order to overcome stress or anxiety. But before that, a brief explanation will be provided about stress and biofeedback training. The explanation includes: a) What are stress response and relaxation response? b) How do we use pulse/ heart rate to recognize, regulate and control stress level? c) What is the essence of biofeedback game based training in terms of stress control?

Biofeedback is a form of self-regulation in which individuals learn to control physiological responses by providing them with an information signal, as sensory feedback, about biological conditions of which they may not be ordinarily aware. Feedback responses include muscle tension, skin surface temperature, brain wave activity, galvanic skin response, blood pressure, and heart rate. In combination with therapeutic instruction and practice, the feedback signals enable the students to become active participants in the rehabilitation or health maintenance process.

The importance of using Biofeedback Games Based Training with academic performance module as a Rehabilitation Module is to reduce the level of anxiety of the students and teach them on relaxation technique. When playing the game the students will learn the skills of self-regulation and emotional control. The success of winning the game depends on their ability to use biofeedback to control their heart/pulse rate.

The biofeedback approach is oriented toward helping the individual learn skills which empower him or her to take greater self-responsibility for health and all the other dimensions of functional life. It is not a treatment or therapy. It is a coaching and training process. Under the biofeedback control they can analyze their actions during the game that help them choose the most proper individual strategy of relaxation. Playing the game they will reveal new behavioral possibilities under stressful conditions, acquire physical

sensations of comfort and relaxation. In real stressful situations they can use their skill of self-regulation to get relaxed easily.

Biofeedback training programs have been around colleges and universities since the late 1960s with some programs proving to be more successful than others (Ratanasiripong, et.al, 2010). According to him, Biofeedback training is a method of helping individuals learn how to control various physiological processes such as muscle tension, blood pressure, breathing, heart rate, brain wave states, skin temperature, and skin conductance.

After everything is clear, then it is the time to experience the biofeedback training. The specific steps are as follows.

a) Start from a comfortable position (see Figure. 3.2), taking VIRA as an example.

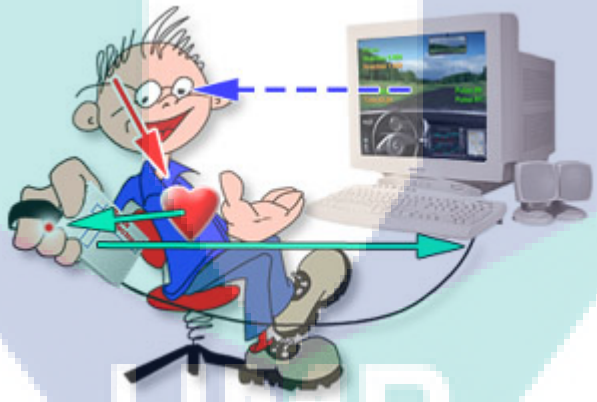

Figure. 3.2: Comfortable Position while playing VIRA

b) Two-three trials without instructor's assistance (using VIRA competition games). The task is: "The speed of your sportsman depends on your heart rate. The slower your pulse, the faster moves the sportsman. The speed of your competitor is your average pulse from the previous trial. To win you have to keep pulse stable, not rapid.

c) Part 1. Short presentation of all games will be made and the client will be asked to pick out the game he prefers to train at. The aim of the session is to choose and learn the most proper way of relaxation/concentration technique considering change of pulse

values during trials. Start from short distance in VIRA, noting that music and sounds could be distractive, then switch it off.

d) Part 2-4. The aim of this part is to learn relaxation/concentration techniques further and to use these skills to control the speed of the sportsman. The task for student is to stay calm despite challenge of the screen competition. Instructor observes students' performance. After the session is over, participants assess their progress using graphs from of results presenting.

e) Part 5-10. During these parts clients continue to improve obtained skills of relaxation/concentration controlling pulse and trying to stay calm and neutral rather than anxious/agitated. In the end of these parts, the student assesses his/her progress using graph presentation of results.

f) Final part. Final part is essential to estimate obtained skills of psycho-physiological control, by discussing with the instructor the use of the skills in everyday life and by comparing heart rate dynamics at the beginning and at the end of biofeedback course.

3.3.3 Integration of Biofeedback Training into Rehabilitation Module

The intention to integrate Biofeedback Computer Game-based Training into learning module is to help technical college students to learn self regulation and to develop relaxation technique. With the use of special sensor equipment in the training, the student can objectively watch the feedback of the pulse rate whether they are stress or not and they will learn to adjust to various levels of stress. Moreover, it informs and educates the students to obtain a sense of mastery and self reliance when managing stress situation

The biofeedback computer games being used in this study is VIRA. Before they play the game, the students have to hold the Pulse Detector device with their left or right hand. Then, they have to place an index or middle finger onto the sensor of the Pulse Detector Device and hold it down securely with velcro tape. After that they have to check the flash of the red indicator synchronized with the pulse to show that indication of good contact between the finger and the sensor. For this treatment they only have to choose

VIRA games. The game will pause when Pulse Detector Device fails to detect the pulse rate. See figure 3.3.

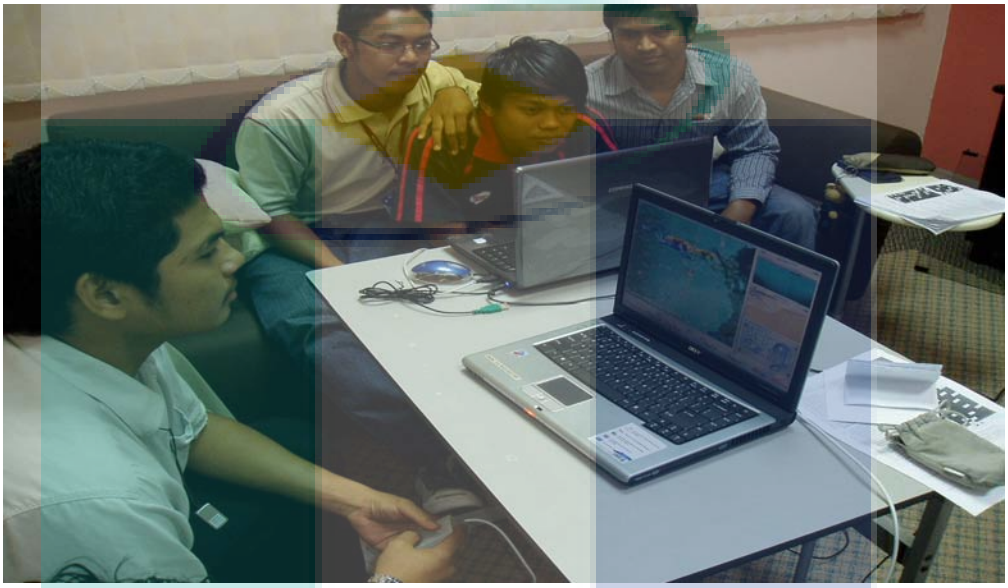

Figure 3.3: Biofeedback Training

VIRA is an underwater diving competition to search for treasure game. The main screen (seen in Fig.3.4) shows a map to select one of three locations for diving underwater. The sample has to click on any red cross to go to the Game Screen. On the Game Screen there are four figures to illustrate how the game is progressing and seven icons at the bottom of the screen are for controlling the game and depict the game results. Three figures on the right of the screen show important details:

Figure.3.4: Main screen of VIRA game

The upper figure (Position) represents the long shot of the game. It displays the location (or distance between the surface and bottom of the sea) of the two divers. The left blue point represent the sample position and the right green point show the competitor's position. At any time, the diver closer to the bottom of the sea has the winning advantage.

The middle figure (Trophy) displays the treasure collected during the game session. The sample will get a trophy everytime finish before the other diver. When they lose, all treasure collected in the current game session will disappear. However point collected are not erased. Also when the sample has learned relaxation technique they have the chances to collect more than two trophies in a row and they can collect as many as six in a row.

The lowest figure (Speed) depicts the current speed of the diver. It illustrates the changes of the pulse rate signals in graph form. The green line shows the competitor speed. When the pulse rate decreases, the curves runs up.Large amplitude of the speed graph reflects the instability. It is advisable to start playing the game when the heart rate is stable. It is not recommended to start the game soon after intensive physical activities as the Pulse Detector Device may respond in a wrong way due to high pulse rate. The students may win the game but without any real benefit to their health. This is due to with or without self-

control, heart rate will decrease during the recovery after each physical activity. Below are the example of proper (fig. 3.5) and poor (fig. 3.6) signal registration.

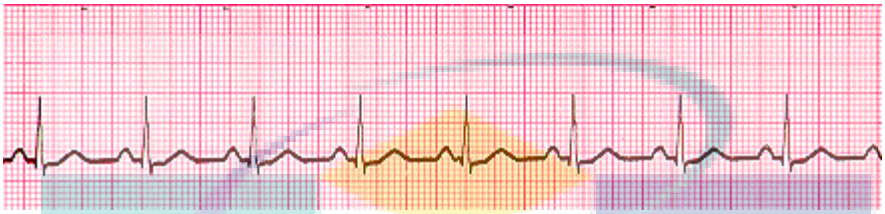

Figure.3.5: Proper Signal of Pulse Rate

Figure.3.6: Poor Signal of Pulse Rate

3.3.4 COGNITIVE TECHNIQUE SESSION

To strengthen this element, the student needs to do "Writing Self Help Form". Self Help Form is a way to help client to think in a more positive and more rational way through the alphabet approach (A-B-C-D-E-F). Contents of Self Help Form are as explained below. This technique was created by Windy Dryden and Jane Walker and Revised by Albert Ellis (Monces, 2002). More details refer to **Appendix A1.**

1) A's - Activating Events

   A is activating events or situation that people experience. On the top of the form, on the left hand side, there is a box labeled "A (Activating Events)." In this box, the students have to write about a sad event that happened to them today (focus on monitoring those times when they feel particularly sad or when they are tired/fatigued). If there is a day where nothing particularly sad happens, they have to fill in this "A" box with either (a) an upsetting event that happened to them in the past, or (b) an upsetting event they have caused.

2) C's - Consequences following the events.

   C is consequences on how people feel or act based on these beliefs. On the top of the form, on the right hand side, there is a box labeled "C (Consequences)." In this box, the student has to write the consequences of the event. There can be three types of consequences. They may experience one, two, or all three of them.First, unhealthy negative feelings can be like depressed mood, fear, rage, etc. Second, unhelpful behaviors can be like unproductive or harmful in some way. Third, negative physical consequences of distress can be like an argument among themselves, or they may find themselves flushed, hot, or shaking. There are several examples provided below the box, but the students are encouraged to write in whatever words best describe their experience.

3) The Keys to Change: B's - Negative or Unhelpful Beliefs

   B is a **B**eliefs or thoughts regarding the situation as previously described, even though it may seem like an upsetting event (A) leads them to feel upset (C), this is not 100% true. In reality, it is not the event itself that upsets them, it is their negative or unhelpful beliefs (B's) about the event that upset them. According to Beck (1995), typically unhelpful beliefs fall into three categories. More refers to **Appendix A2.**

4) D's - Debating your Negative Beliefs.

   After recognizing the negative or unhelpful thoughts, the next step is to debate or challenge them in a collaborative, Socratic, and active way. There are lots of different ways to do this.

5) E's - Effective/Helpful Belief.

   Once they have successfully debated against their negative beliefs, the students should be ready to replace them with new more effective or more helpful beliefs.

6) F's - New More Functional Emotions and Behaviors

   By changing negative beliefs into more helpful ones, the student should now feel better emotionally; behave in a more helpful way; feel better physically.

3.3.5 BEHAVIOR TECHNIQUE SESSION

Before the student proceeds with the Behavior Techniques session, each student was given a set of questionnaire consisting of the question booklet and the response sheet personality test. Credo Personality Profiling (CPP) was used in this session. The Credo Personality Profile is based on over 30 years of research and includes most traits found in other tools, yet groups them into six clusters that relate to the brain's structure (Shephard, 2005).

Secondly, the student will be given a task named “The Master Notebook System Organization Strategies”. The Master Notebook System helps students keep paperwork and materials organized and in one place, locate important papers, and refrain from carrying around unnecessary clutter. It also helps students prepare for tests because they compile and summarize work weekly. The system contains three parts: working notebook, reserve accordion file, and reference notebook.

(a) Working Notebook

The working notebook is a daily notebook for the student to take to class. It holds all the papers and information needed for each day. The working notebook should contain: a portable three-hole punch; a zippered pouch with three holes to hold highlighters, pencils, pens, clips, "sticky notes", and other small supplies; a planner/calendar; a ruler; four section dividers for each subject labeled homework, notes, handouts, and quizzes/tests and an assignment book.

The important thing is that on a daily basis, the students should date and file any of his class papers under the appropriate divider for each subject. The student should also note assignments in detail in his assignment book. Content that consist in the working notebook as per **appendix A3**.

(b) Reserve Accordion File

The reserve accordion file is for filing completed work and material no longer needed for class. The file stays at home. It provides a single place to organize and store finished work. It also keeps the working notebook from getting too full.

(c) Reference Notebook

The reference notebook is a section at the back of the working notebook. The reference notebook is an individualized collection of resources; it reflects the students' specific needs. It should contain handouts and lists of information the students needs to reference quickly in class. Some items to include are: a personal spelling list of commonly used words those are particularly difficult for the student; math facts; and formula.

Finally, the objectives of this Behavior Technique session is to make the students more effective and to reduce the students' level of stress by making note of upcoming event and planning; to help the students to structure their days and to keep control of their time and energies over the long haul; to help the students to manage their study time and to learn on how to do a systematic study skill.

(d) Credo Personality Profiling

Credo Personality Profiling (CPP) was used in this research. The Credo Personality Profile is based on over 30 years of research and includes most traits found in other tools, yet groups them into six clusters that relate to the brain's structure. The CPP lists traits considered positive and essential for success in a work environment and due to this, no one's self esteem in lowered. The traits are also categorised into Temperament, Aptitudes (Talent) and Drives. Having a high score in a particular cluster represents only one aspect of the personality, as different traits are needed for different jobs, often at different periods in life. The validity of CPP is due partly to its strong correlation with several other well

known, highly valid profiling tools. It has also been tested against cultural and linguistic norms. The profiling also can be done through online by register at http://cpp.india.m-bytes.com/User.html where the reports would be emailed.

Credo Personality Profiling (CPP) described a personality trait as a quality or characteristic of a person that is enduring and generally remains stable after age 25 to 30. It can be talent and intelligent. It also can be preferred style of feeling, thinking and behaving. The Credo Personality Profiling (CPP)suggests that by knowing strong traits, that person can better understand the behavioral style preference such as communicating, learning, leading, planning, and organizing life, problem solving, making decision and many more. When people are doing something they really enjoy, they get more things done and they do it better. According to Nancy Wilson (2009), researches have indicated a significant correlation between personality traits and academic performance. Students high in conscientiousness and extroversion experience gained greater academic success, which is evidenced by their GPAs (Lievens, Coetsier, De Fruyt, & De Maeseneer, 2002; Rau & Durand, 2000; Ridgell&Lounsbury, 2004). Aside from personality traits correlating to academic performance, self-efficacy, that is, the belief in one's ability to perform (Bandura, 1997), can affect a student's motivation to succeed and attain goals. These variables also are related to attrition rates (Higgins, 2005). Higher self-efficacy beliefs can lead to better academic performance (Audia, Locke, & Smith, 2000).

Credo Personality Profile (CPP) describes personality traits as long term predispositions for behavior. They tend to be strongly influenced by our inherited endowment perhaps as high as 80%. While culture upbringing and nurture can stimulate or reward such behavior, the root cause is more genetic. This is why they tend to endure for life and become a visible predictor or patterns and style of behavior. In the study of personality, traits are any enduring and relatively consistent characteristic of our feelings, thinking and behavior. They comprise: aptitude (talents/intelligences), some motivational drives (or need) and temperament.

By knowing which “cluster of traits” comprise our natural aptitude, drive and temperament, the students can select better studies area that are closely associated with their personality. They may be very strong in some, moderate in many and very weak in a few. Having an insight into those traits that are strong can help them choose a more rewarding career, vocation or profession as well as a deeper understanding of why they are the way they are and why they get along better with some people and less so with others.

A sample of CPP can be seen in Figure. 3.7. Refer to **Appendix A4** for each cluster of personality type profiling.

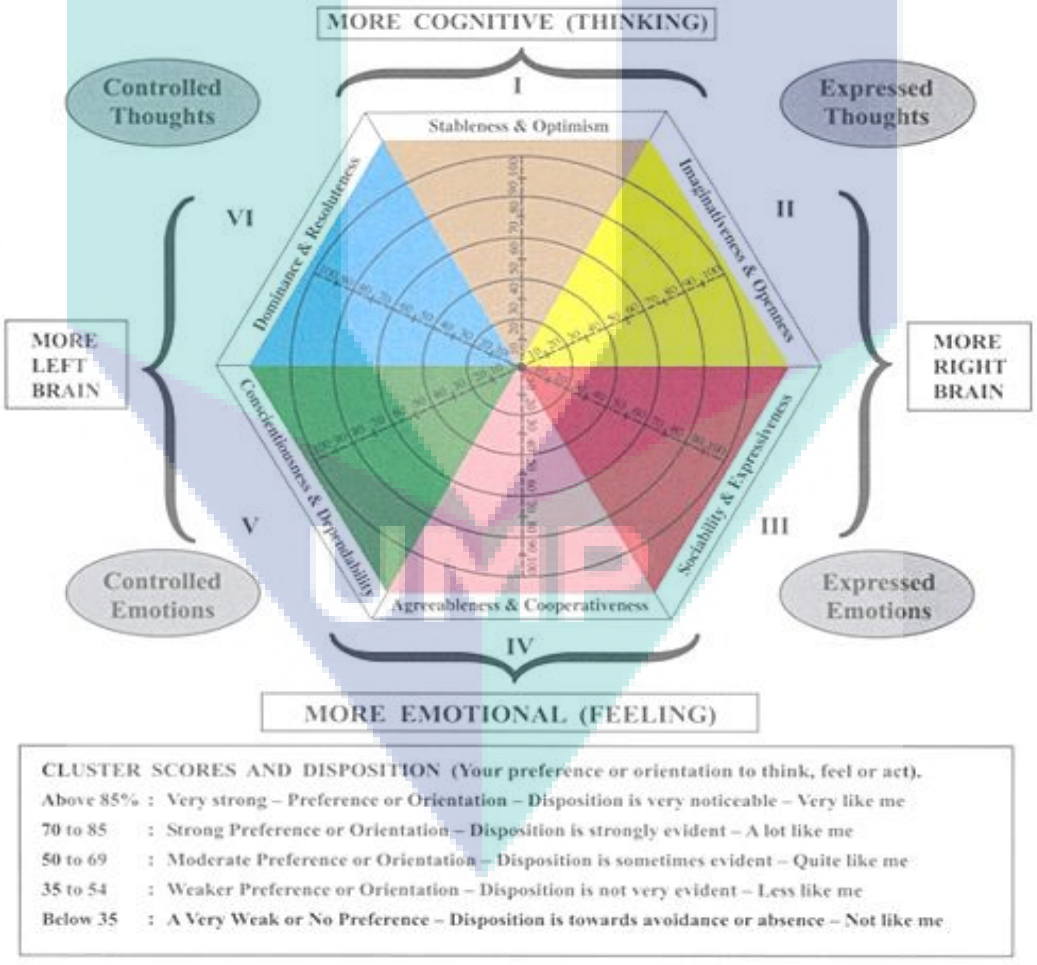

Figure.3.7: Sample of Credo Personality Profiling

Source: www.brainmatters.com.my

The CPP validity is due more to the correlation with behavioral genetics, biological influences ant the anatomy or physiology of the brain rather than psychological models of behavior. The CPP has its roots going back over thirty years evolving the solid foundations of psychological research. However it is now based on the more recent research into brain physiology from the pioneer studies of the Nobel prize winning team of neuro-scientists led by Roger Sperry and work by Robert Ornstein on the "split brain concept". Some CPP traits have been clustered as more "left" brained (Blue and Green) or "right" brain (Yellow and Red). These correlate strongly with the well documented "Split Brain" research.

Before the student proceeds with the experiment, each student was given a set of questionnaire consisting of the question booklet and the response sheet. They were given 30-40 minutes to respond to all 72 items. Both booklet and answer sheets were taken back from the student after the 40 minutes was over. The scoring of the raw data was conducted using descriptive statistics. The raw score for each category was calculated and this becomes the total score for each respective category. The raw sub total score from each category is divided into percentage then will be transferred to CPP folder and plot the percentage scores from each category on the CPP hexagon model to know the personality profile. Figure 3.8 shows the sample filling CPP questionnaires.

Figure 3.8: The sample filling CPP questionnaires.

There are six clusters of personality represent by I,II,III, IV,V VI. Scoring of the raw data was conducted using simple descriptive statistic. The raw score for each category was calculated and this becomes the total score for each respective category. The highest total is 100 point and the lowest total is 0. The raw sub total score from each category divided into percentage then will be transferred to CPP folder and plot the percentage scores from each category on the CPP hexagon model to know the personality profile as per Fig.3.9 below. Having a high score in a particular cluster represents only one aspect of the personality. CPP's questionnaire as per **appendix A5**.

I / A	II / B	III / C	IV / D	V / E	VI / F	Average
50	45	70	50	65	50	55

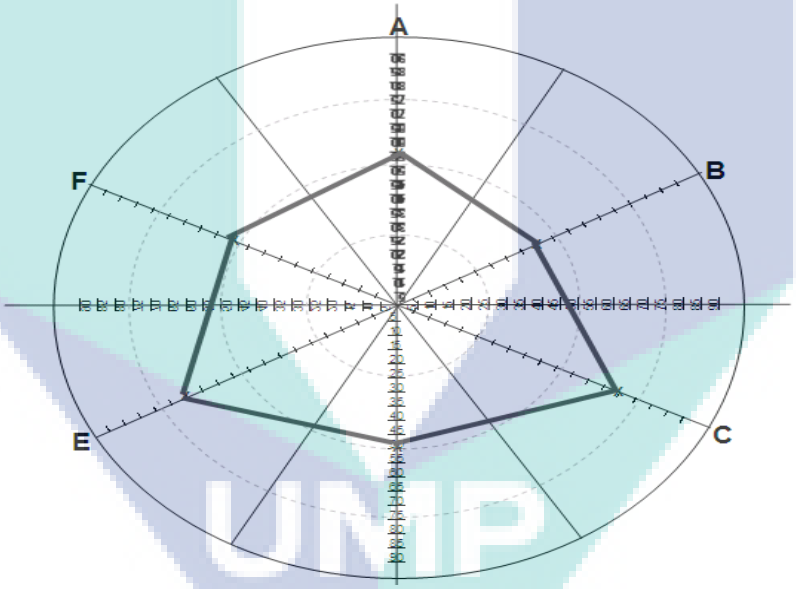

Figure 3.9: Personality Analysis
Source: Life Matters (2005)

3.4 DATA COLLECTION AND ANALISYS

The Sampling Method were used is purposive random sampling. In random sampling, all items have some chance of selection that can be calculated. From purposive random sampling the sample is selected only among the Technical Students which is fit with the objective of this study. The sample is a subset of a Technical Student's population.

Since it is impractical to test every member of a population, a sample from the population is typically the best approach available. The purposive random selection of the sample enables to confidently generalize results from a small sample to a larger population.

This study presents the technology of computer biofeedback game. Biofeedback computer training game is not a treatment but a training programme that helps the students familiarize themselves with their body system. This will help them to control and self-regulate their body activities.

Training sessions were conducted at PSDC's library named as Conference Room 2. Biofeedback Computer Games Based Training is used in order to train the students on how to learn the skill of self-regulation and emotional control. The success of winning the games depends on their ability to use biofeedback to control their heart rhythm or pulse rate. While playing the games, they are training themselves to relax at their own will. The game is developed and designed to train the students to be in control of their own psychological indices. It is controlled by their heart rhythm or pulse rate which is stress index and reflect rather accurately their psycho-emotional tension. Once the stress level becomes more manageable, mental ability is enhanced to improve concentration and optimize performance (SMRC, 2005).

While playing the game, the sensitive devices pick up signals from the body and translate it to information displayed on the screen. From the information, the students become aware of the results of their attempt to control their psychological state. Hence, there are given information to learn to control their psychological function, their capacity to relax and improve concentrate over time until they reach the desired result (SMRC, 2005). They may notice on the screen that despites all their attempts to relax, they are slowing down while the competitor gaining speed. However they have to remain calm and try to relax as much as possible. In this way, they will learn to manage their stress level.

After five tests, the results are shown in Fig.3.10 that the person has a strong emotion and has the capability to control heart rate. The ability to control depends greatly

on individual to control body movement and mind relaxation. With this ability individual have the capacity to win the game. If he wins, he needs to maintain the said performance with the strong emotional control.

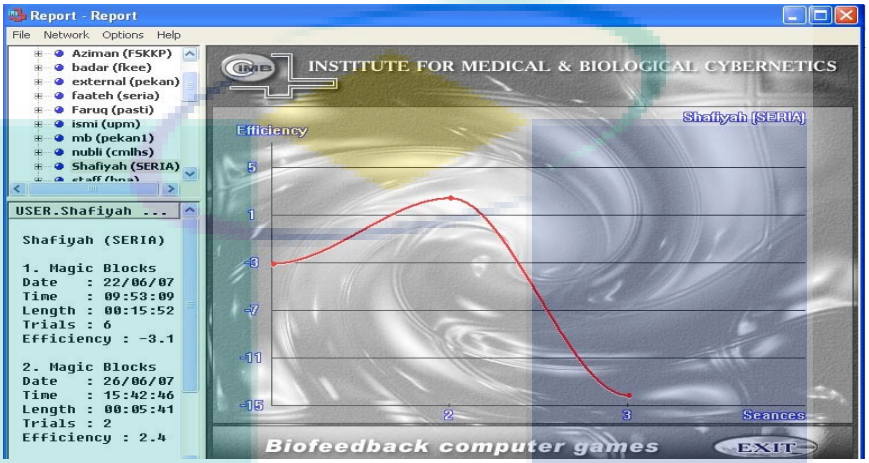

Figure.3.10: Good Tests Result of Vira Games.

After five tests, the result can also be in an oppose way that there is an increase of the curve (seen in Fig. 3.11) It shows that the person is unable to control heart movement. The longer the person plays the game the more unstable his emotion is. This indicates that his emotion is disturbed or unable to control his heart rate.

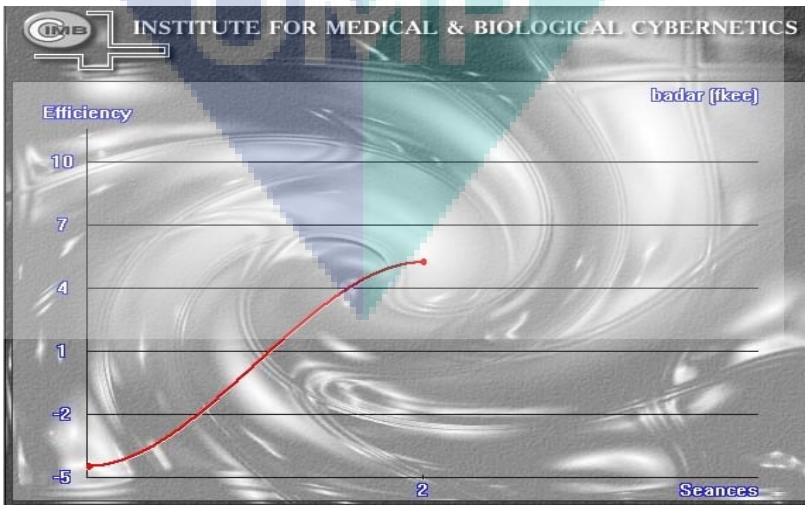

Figure.3.11: A sample poor performance from Vira game

Academic performance based on the grading system which is the Hybrid System where the Cumulative Grade Point Average (CGPA). Generally, students shall be evaluated through two (2) evaluation components, as follows:

i) Final examination which shall constitute 40% - 60% of the total marks; and
ii) Course work, which includes test, quiz, project, laboratory report etc., which shall constitute 60% - 40% of the total marks.

The results were quoted in Grade Point Average (GPA) and Cumulative Point Average (CPA) which are calculated as follows:

$$\text{GPA} = \frac{\text{Summation of points for the semester}}{\text{Total credit hours in the semester}}$$

$$\text{CGPA} = \frac{\text{Summation of points for all semesters}}{\text{Total credit hours for all semesters}}$$

To categorize the student high, medium or low achiever is based on UniversitiTeknologi Malaysia's standard for graduation which is CGPA 3.70-4.0 classified as First Class, CGPA 2.00 - 3.69 Second Class and below 2.00 is failed. For this research the grades have being summarized as Table 3.2:

Table 3.2: Classification of Achievement Based on Academic Performance Result

CGPA	**Achievement**
3.70 -4.00	High Achiver
3.69 – 2.00	Medium Achiver
1.99 - below	Low Achiever

3.5 CONCLUSION

This chapter described and discussed about methodology that had been used in order to develop MCBE-REBT Academic Performance Module. The module consist of three technique that compliment to each other's. Thus, combination of this three technique which is mental, cognitive and behavior technique is to help the students feel better physically and emotionally and to engage in healthier behaviors.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 INTRODUCTION

This chapter will elaborate on the findings of capability MCBE-REBT Academic Performance Module in order to build up the emotional competencies among the students so that they are more capable to learn and perform better academically as well as to train the students on ability to self- manage emotions.

4.2 RESULT FROM THE RESEARCH OBJECTIVE 1.

The relationship between MECB- REBT Module as a rehabilitation module and academic performance was investigated by bivariate Spearman's rho correlations. Data used in this analysis are changes on Heart Rate between pre and post (delta Heart Rate) and changes between previous GPA and latest GPA (delta GPA) (see table 4.1). Table 4.2 displays the Spearman, r_s, correlation matrix of outcome measures improvement (delta changes scores) on the total sample. It is shown that there is no significant correlation between improvement in GPA and biofeedback training as indicated by heart rate reduction.

Table 4.1: Delta HR and Delta GPA

Respondent ID	Delta GPA	Delta HR
M1	0.06	-15.2
M2	-0.32	-6.8
M3	0	11
M4	-0.29	-10.2
M5	-0.3	-6.2
M6	-0.31	-22.6
M7	0.01	-5.6
F1	-0.18	-9
F2	-0.78	-6.6
M8	0.06	-20.4
F3	-0.54	-21.4
F4	0.04	-2.2

Table 4.2. Correlations between Heart Rate (Biofeedback training index) and Academic Performance (i.e. GPA)

		Delta_HR	Delta_GPA
Delta_HR	Correlation Coefficient	1.000	0.165
	Sig. (1-tailed)	0.0	0.305
	N	12.0	12.0
Delta_GPA	Correlation Coefficient	0.165	1.000
	Sig. (1-tailed)	0.305	0.0
	N	12.0	12.0

According to Thomas & Terry (1986), biofeedback training is an intervention that has been previously successfull in reducing anxiety. In addition to looking at the use of biofeedback to reduce test anxiety, researcher have utilized biofeedback training to improve academic achievement (Carter & Russel, 1980; Denkowski, et.al, 1983; Russell & Carter, 1978). These studies suggest that biofeedback which integrated in the module is a successful method for helping students improve academically.

MCBE-REBT module consists of three techniques which is mental technique, cognitive technique and behavior technique. All the techniques complement each other in

health promotion to give a better environment and condition to all technical college students such as stress reduction technique and mind-body control technique. The module facilitate the students to learn self-regulation which is later the student have the ability to manager control their own behavior. By practicing that method, they have the ability of self-monitoring and self-reinforcement which is also may help in regulating their performance as well as stress reduction behavior.

As we can see, MECB-REBT programmed will help the students to relish quickly taking control of their own life, rather than remaining dependent upon a therapist for years. By giving the tools for identifying and overcoming the true source of all the difficulties, it will prepare them to act in many ways as their own therapist. By helping them to reinforce realistic, self-benefitting beliefs, it will enable them to eliminate present emotional and behavioral problems, and to avoid future ones.

With the advent of cognitive methods, cognitive-behavioral therapy addressed not only behavioral analysis and stimulus response associations, but also included student's thoughts, feelings, ideas, and suppositions for "second order" change that would detect, correct, test, and dispute irrational thoughts and pathological cognitive schemas (Hayes et al., 2004).

The Treatment Module consists of three techniques which is mental technique, cognitive technique and behavior technique. All the techniques complement each other in health promotion to give a better environment and condition to all technical college students such as stress reduction technique and mind-body control technique. The module facilitate the students to learn self-regulation which is later the student have the ability to control their own behavior. By practicing that method, they have the ability of self-monitoring and self-reinforcement which is also may help in regulating their performance as well as stress reduction behavior.

According to a research by Lindner & Harris, (1993), self-regulated learning represents the integration and use of cognitive, metacognitive, motivational, perceptual, and

environmental components to successfully complete academic tasks. At the college level, self-regulated learning appears to be an important aspect of academic performance. A statistically significant relationship between self-regulated learning and overall academic achievement has been documented at the college level in several studies (Lindner & Harris; Paterson, 1996). That self-regulated learners were more likely to have better learning skills than their counterparts suggests that self-regulated learning skills were important predictors of academic success (Onwuegbuzie et al., 2001).

By playing Biofeedback Computer Games Based Training, the students may learn how to regulate their own mental, emotional, and other physiological responses to stressor events in their life. Once they learn to voluntarily control what were previously involuntarily, subconsciously, or habitually controlled behaviors, then they will go on to develop new, positive automatic self-responsible habits. With biofeedback computer game they learn skills which they will use and practice on a regular basis. It is not a treatment that is done to them. It is a learning process which they integrate into their repertoire of inner strengths and skills. They learn to recognize how it feels when they are focusing more effectively and when you are spacing out, allowing themselves to become distracted. If they continue to use their brain, at the new level, then the improvements are retained even without the continued use of biofeedback.

As a conclusion, the proposed academic performance module as an Rehabilitation Module may improve student's performance which is it has an improvement on emotional stability of the student which is they are more confident in their study. This result is in line with the objective of the study which is to develop a rehabilitation module and assess the effect of the module towards academic achievement of technical college students.

4.3 RESULT FROM THE RESEARCH OBJECTIVE 2

Through biofeedback training an individual first gains awareness of the physiological processes occurring within the body and learns to consciously control those processes. Specifically, the individual is trained to modulate the symptoms of stress and

anxiety which lead to better functioning for the individual. Ultimately, biofeedback can help individuals with stress, anxiety, college adjustment, depression, hypertension, tension headache, and many other issues (See & Czerlinsky, 1990; Siepmann, Aykac, Unterdorfer, Petrowski, & Mueck-Weymann, 2008; Hammond, 2005; Tsai, Chang, Chang, Lee, & Wang, 2005; Nestoriuc, Rief, & Martin, 2008).

According to Bond & Dryden (1996), rational emotive behavior therapy (REBT) is one type of cognitive-behavior therapy (CBT) and as such, it hypothesises that people's beliefs largely determine their psychological health. It is unique because of its specification of what aspect of beliefs is responsible for affecting people's psychological well-being. Specifically, REBT maintains that rational beliefs lead to functional emotions and inferences (i.e. judgements about events that go beyond the available data), and irrational beliefs lead to dysfunctional emotions and inferences (Dryden & Ellis, 1988; Ellis, 1994).

Integration Biofeedback Computer Games Based Training with MCBE-REBT Module will create mind-body connection. By understanding the relationship of mind body, it will help the students to understand how to manage stress. A research by Kristine & Winifred (2003), stressed out that most individuals are unaware that they have the ability to use their mind, through various relaxation techniques (for example), to gain control over their body's responses. As indicated earlier, stress produces changes within the autonomic nervous system, leading to various stress related disorders which include increased heart rate, blood pressure, respirations, muscle tension, sweat gland activity, and the peripheral vasoconstriction associated with cold hands and feet (Basmajian, 1989; den Boer, 1997; Ellison, 1996; SchwarK & Associates, 1995). Individuals can learn to control these stress responses through biofeedback (Kristine & Winifred 2003).

Table 4.3: Biofeedback Treatment Result

ID	PT	PRE TEST - heart rate						ADMINISTERED TREATMENT						POST TEST						ABTY	Prev CGPA	Ltst CGPA
		T1	T2	T3	T4	T5	Mean	T1	T2	T3	T4	T5	Mean	T1	T2	T3	T4	T5	Mean			
1	I	71.6	68.5	74.2	76.7	75.2	73.24	76.8	76.8	77.5	86.4	77.4	78.98	64.5	53.3	58.8	61.6	52	58.04	YES	3.70	3.76
2	III	80.1	80.9	71.2	70.3	77.8	76.06	77.9	78.3	77.7	91.2	93.3	83.68	71.1	68.7	69.6	67.3	68.8	69.1	YES	2.80	2.48
3	IV	86	93.9	71.4	76.3	88.2	83.16	81.5	83.2	80.9	74.5	79.8	79.98	95.9	96.7	93.8	94.4	88.7	93.9	NO	3.64	3.64
4	IV	90	99.3	80.5	85.2	85.5	88.1	81.1	86.4	86.5	91.4	85.7	86.22	81.3	81.7	77.4	78.1	71.8	78.06	YES	2.85	2.56
5	I	80.3	74.6	72.8	71.5	66	73.04	67.9	66.2	65.2	67.7	68.7	67.14	70.2	73.1	64	69.3	58.9	67.1	YES	3.44	3.14
6	IV	90.6	96.3	101.3	84.9	77.7	90.16	77.3	76.7	78.7	80.6	74.3	77.52	58.9	69.6	70.5	67	70.6	67.32	YES	3.10	2.79
7	II	84	89.1	82.7	75.4	71.4	80.52	71.5	70.3	73.9	76.8	76.3	73.76	76.8	78	73.4	72.8	72.9	74.78	YES	3.20	3.21
8	II	78.6	81.9	77.5	71.9	65.5	75.08	74.9	79.7	82.7	80.2	76.9	78.88	67.8	74	58.6	63.6	67	66.2	YES	3.13	2.95
9	IV	83.9	76.8	81.4	85.3	86.1	82.7	93.4	89.7	88.3	91.9	87.5	90.16	68.4	75.2	75.7	79.1	81.7	76.02	YES	2.89	2.11
10	IV	88.1	76.9	78.5	83.3	89.1	83.18	71.1	78.1	74	75.8	70.3	73.86	61.1	64	58.3	63.6	67	62.8	YES	2.20	2.26
11	IV	74.1	68.8	68.3	70.4	70.9	70.5	82	86.5	86.4	89.2	84.3	85.68	56	52	44.8	48.1	44.1	49	YES	2.75	2.21
12	IV	73.4	79.6	77.5	75.9	72.4	75.76	78	70.6	67.4	71.3	72.3	71.92	61.2	68.1	83.5	85.8	68.8	73.48	YES	2.95	2.99

Note : PT = Personality Traits, ABTY = Ability to Control Emotional, Prev CGPA= Previous CGPA, Ltst CGPA = Latest CGPA, PS = Personality Score, T = Trial

Table 4.3 shows the changes of heart rate when the students play the Biofeedback Computer Games. The changes show that they are on learning the skills of self regulation and emotional control. The result showed that 11 (92%) students were succeeding to win the game during Post Test Treatment. The success of winning the games will depend on their ability to use biofeedback to control their heart rhythm or pulse rate. While playing the game they are training themselves to relax at their own will and help them in behavior modification by promoting self regulation. This is a skill, which can be improved with biofeedback training. Self regulated learning strategies are the compilation of executable plans a learner uses in order to attain a goal. Self-regulation is learned by use of biofeedback. Gaining self-regulation ability to control stress responses can assist student performance in the classroom, in social interactions, during athletic events, and in job situations. Under the biofeedback control they can analyze their actions during the game that help them choose the most proper individual strategy of relaxation. Playing the game they will reveal new behavioral possibilities under stress conditions, acquire physical sensations of comfort and relaxation. In a real stress situation they can use their skill of self-regulation to get relaxed easily.

The importance of using Biofeedback with academic performance module is to reduce level of anxiety of the students and teach them on relaxation technique. Table 4.4 displayed average of heart rate data from five trials for each respondent. According to figure 4.1, on average subjects were able to reduce their heart rate from trial one to trial five for each condition (pre, treatment, post). A Non-Parametric Friedman Test is used to evaluate whether any difference on heart rate measure among three conditions (pre, treatment, and post treatment). The descriptive statistics is displayed in table 4.5. All tests were conducted with significance level 0.05.

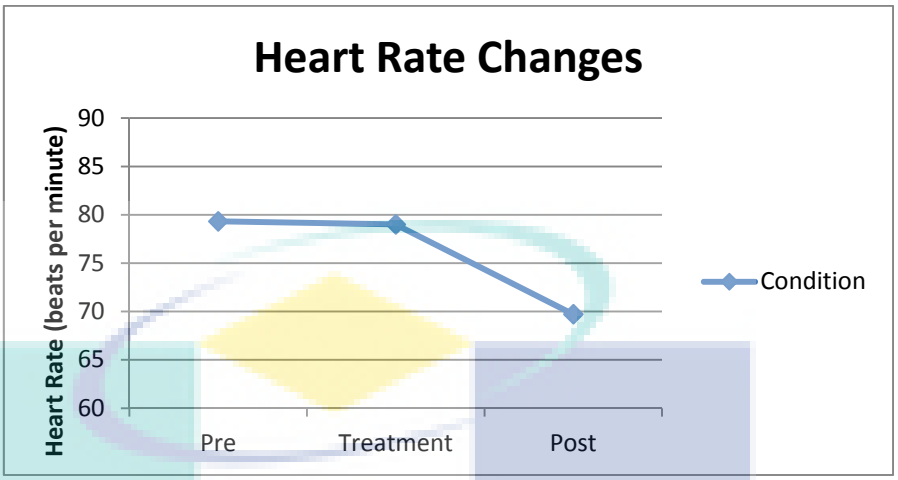

Figure 4.1: Heart rate changes

Table 4.4. Summary of Heart Rate Measures

Respondent ID	Pre	Treatment	Post
M1	73.4	79	58.2
M2	76	83.6	69.2
M3	83	80.2	94
M4	88.2	86.2	78
M5	73.2	67.2	67
M6	90.2	77.6	67.6
M7	80.4	73.8	74.8
F1	75.4	79	66.4
F2	82.6	90.2	76
M8	83.2	73.8	62.8
F3	70.4	85.6	49
F4	75.8	71.8	73.6

Table 4.5: Descriptive Statistics of Heart Rate Data

	N	Mean	S.D	Min	Max	Percentiles		
						75th	25th	50th (Median)
Pre_HR	12	79.317	6.2421	70.4	90.2	73.900	78.200	83.150
Exp_HR	12	79.000	6.6781	67.2	90.2	73.800	79.000	85.100
Post_HR	12	69.717	11.1660	49.0	94.0	63.700	68.400	75.700

Result of Friedman test shows that the heart rate of subjects receiving biofeedback training significantly reduced from pre to post intervention (χ^2 (2) = 8.667, p = 0.011). Post hoc test was conducted using Wilcoxon-signed rank tests to find which pair of conditions is significantly different. Because there are three pairs of conditions, a Bonferroni correction, then, is applied (significance level 0.05 is divided by 3 ≈ 0.0167). From table 4.6, it is shown that there is a significant reduction on heart rate measures between pre and post treatment while other pairs of conditions are found not significantly different.

Table 4.6: Result of Post Hoc Test

	Exp_HR - Pre_HR	**Post_HR - Pre_HR**	**Post_HR - Exp_HR**
Z	-.157[a]	-2.432[a]	-2.040[a]
Asymp. Sig. (2-tailed)	.875	.015	.041
Exact Sig. (2-tailed)	.893	.012	.042
Exact Sig. (1-tailed)	.447	.006	.021

Where:
a Based on positive ranks.
b Wilcoxon Signed Ranks Tests

4.4 RESULT FROM THE RESEARCH OBJECTIVE 3

The objective was to identify type of personality of the students integrated with MECB-REBT Module. Of the 97 respondents who completed the Credo Personality Profiling, fifty five (55%) showed a preference for Cluster IV personality which is representing Agreeableness and cooperative. The mean GPA of this group was 2.88. Three (3%) showed a preference for Dominance and Resoluteness which is cluster 6. Details of personality profile of college's students as per table 4.7 and figure 4.2.

Table 4.7: Personality Profile of College's Students

Personality Type	Number of males	Number Of Females	Total number for each personality	Percentage
I	9	2	11	11%
II	9	11	20	21%
III	5	3	8	8%
IV	27	26	53	55%
V	1	1	2	2%
VI	2	1	3	3%
TOTAL	**53**	**44**	**97**	**100%**

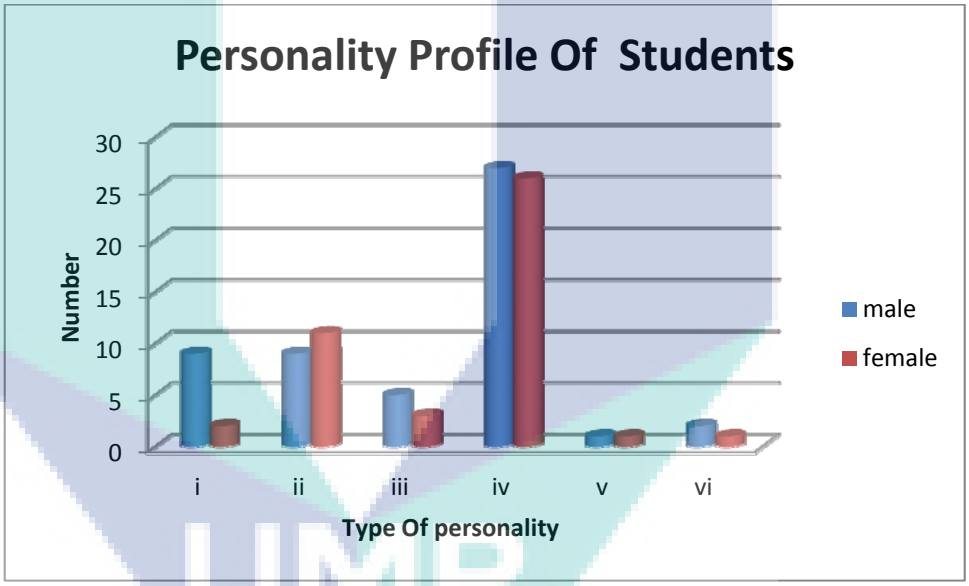

Figure 4.2: Graph of Personality Profile of the Students

From the visual observation it showed that personality profile most of the students were under Cluster IV (Agreeableness), which was then followed by Openness (Cluster II), and then by Stableness (Cluster I). Non-parametric correlation analysis (Spearman's rho) is used for method of analysis. The result is provided in the table 4.8.

Table 4.8: Correlations between Personality and Previous Achievement

			Personality	Previous_ Achievement
Spearman's rho	Personality	Correlation Coefficient	1.000	.045
		Sig. (1-tailed)	.	.331
		N	97	97
	Prev_Achvmnt	Correlation Coefficient	.045	1.000
		Sig. (1-tailed)	.331	.
		N	97	97

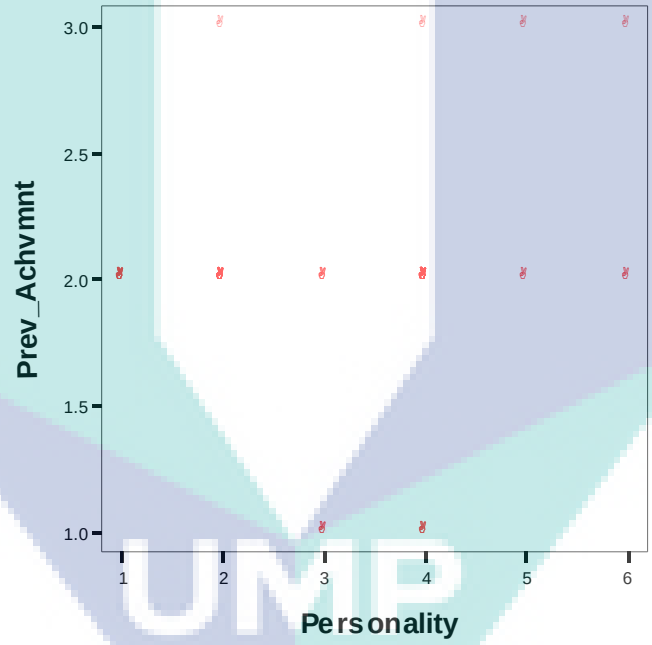

Figure 4.3: Scatter Plot of SPSS Graph

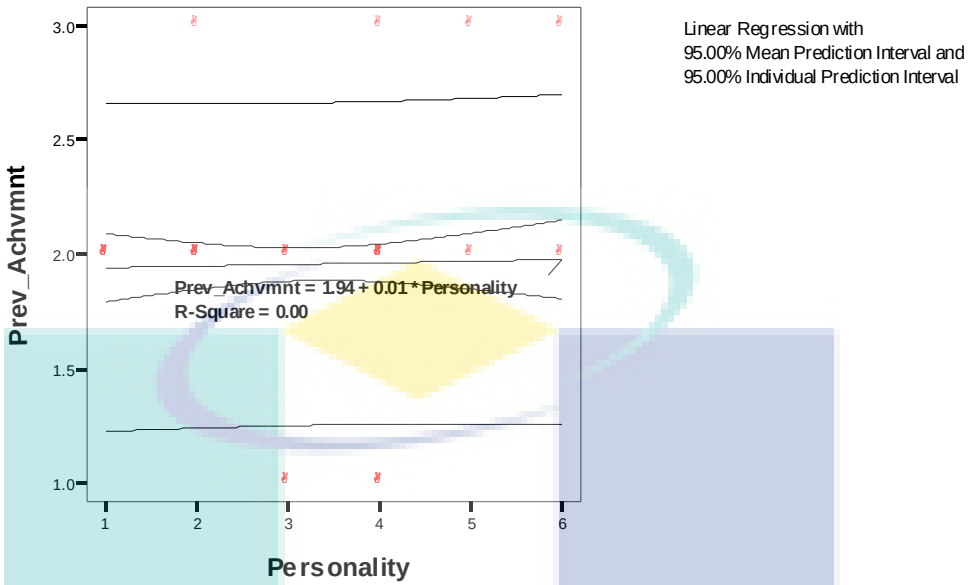

Figure 4.4: Scatter Plot of SPSS Graph – Regression Fit

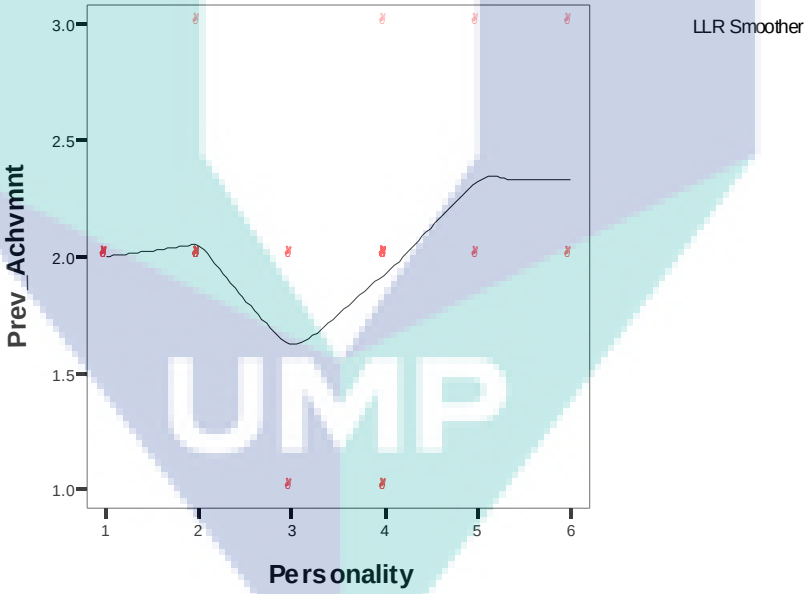

Figure 4.5. Scatter Plot of SPSS Graph – Smoother Fit

Table 4.8 showed that correlation between personality trait and previous academic achievement (i.e. low, medium, high) is not statistically significant because its respective significant value is less than 0.05. Correlation coefficient is also very small (r_s = 0.045) which means that the personality trait only accounts for 0.2% of the variability in academic

achievement. Figure 4.3 also displayed that data is widespread without specific pattern. This result is also supported by figure 4.4 and 4.5 with regression or smoother. Regression will fit the straight line that best represents the relationship between the variables in the scatterplot while Smoother will fit the curved line. As a conclusion the data from the study does not have sufficient evidence to reject null hypothesis. In other words, that there is no relationship between personality trait and academic achievement.

Maybe factors affecting academic performance are not solely contributed by personality trait. Ramsden (1992) suggests student's learning outcome are directly influenced by their orientation to learning. An individual's orientation to learning is likely to be influenced by their educational experiences. Their approach to leraning is a function of both their learning orientation and their perception of task requirements. Learning task perception are in turn influenced by the context of learning are curriculum, teaching processes and assessment method. This college's students are primarily from engineering field. Perhaps the personality factor is more consistently associated with academic performance is Conscientiousness (Blickle,1996; Busato, et al. ,2000; Costa and McCrae,1992; De Raad and Schouwenburg,1996; Goff and Ackerman,1992). Several studies have also evidenced Conscientiousness differences in work performance (Mount and Barrick, 1995; Salgado, 1997). Another explanation has been that Conscientiousness is closely related to motivation, a variable of considerable importance with regard to all types of performance (Andersson and Keith,1997; Boekaerts, 1999; Hamilton and Freeman,1971;Pelechano, 1972). According to Campbell (1990), motivation can be understood as the choice of (a)expending effort, (b)the level of effort and (c)persisting at that level of effort. It has been therefore suggested that Conscientiousness and general performance are related through motivation particularly when extrinsic determinants of motivation are held constant (Sackett,Gruys,& Ellingson,1998). A summary for result of CPP questionnaire from 97 subjects is displayed in table 4.9.

Table 4.9: Summary of CPP Questionnaire

Academic achievement	Type of Personality						Total Number Student
	I	II	III	IV	V	VI	
Low	0	0	3	5	0	0	8
Medium	11	19	5	47	1	2	85
High	0	1	0	1	1	1	4
TOTAL	**11**	**20**	**8**	**53**	**2**	**3**	**97**

Table 4.10: Type of Personality

	High score Of CPP	Low score Of CPP
Low and Medium Academic Achievement	Cluster IV : AGREEABLENESS AND COOPERATIVE Likes to be helpful and cooperative. Amiable and sensitive. Concerned about others feelings and view empathizes with them. Tend to agree more than disagree. Can be very trusting and loyal	Cluster VI : DOMINANCE AND RESOLUTENESS More of a follower than a leader. Readily trusts and accept other's view. Less concerned about winning. More laid back and easy going. Avoid competitive situation.

Based on table 4.10, it showed that high score in cluster IV are representative of people who are agreeable and cooperative. They tend to be good natured, warm, empathetic and caring. They are more trusting, kind, compassionate and sensitive to other's need, often described as humble and modest. They may be labeled as courteous, polite and considerate. Their willingness to be agreeable may stem from their naturally high need for affiliation and to be close to people. They tend to be more altruistic and humanistic and like to help others especially those less fortunate than them. If they become a leader they will be more soft and participative in style. They will be more caring, compassionate or nurturing leader,

suited to counseling and conflict resolution but others may take advantage of their good nature.

This type of personality traits suit for work that needs high level of teamwork, teaching, counseling or mentoring, training and human resources, nurturing and caring leadership, customer service and jobs in the hospitality industry and work in area of humanistic or voluntary industry. People who score high on this dimension are empathetic, considerate, friendly, generous, helpful, and generally likable. They also have an optimistic view of human nature. They tend to believe that most people are honest, decent, and trustworthy.

Agreeableness will not be significantly related to academic performance. This prediction is based on the lack of existing evidence for the significant relation between agreeableness and academic performance on one hand, and agreeableness and intelligence on the other (Zeidner and Matthews, 2000). The situation in which agreeableness appears to have high predictive validity is in students' work that involves considerable interpersonal interactions, particularly when the interactions involve helping, and cooperating with others (e.g., group project assignment, group work in the classroom)

To become a high academic achiever, a students should have these criteria of personality:

Table 4.11: Personality Criteria for High Achiever

	High score Of CPP
High Academic Achievement	Cluster V : CONSCIENTIOUSNESS AND DEPENDABALITY Generally punctual. Plans user of time. Plays by the rules- are very professional. Well organized and reliable. Detailed. Follows up. Likes to complete one task before doing another.

Table 4.11 showed high score in cluster “V” depicts a very conscientious and hardworking personality. They tend towards productivity and industriousness. They are more tasks oriented, dependable, reliable, organized, persistent and responsible. They are often labeled as serious, disciplined and decisive. Such conscientiousness makes them a valuable person. They tend to manage their time well and are generally punctual. They may take on too much work and sometimes find it hard to delegate or say “no”. They may be labeled as a “workaholic” but in positive way as they like to be busy and productive. They tend to have naturally high mental energy and others may find it tiring to keep up of the positive “Type A” Personality. They prefer an organized, systematic, orderly, neat and tidy work environment.

Conscientious individuals are generally hard working and reliable. When taken to an extreme, they may also be workaholics, perfectionists, and compulsive in their behavior. People who are low on conscientiousness are not necessarily lazy or immoral, but they tend to be more laid back, less goal oriented, and less driven by success.

The relation between Conscientiousness and academic performance has often been interpreted in terms of motivation; conscientious students are thought to be more motivated to perform well academically than are less conscientiousness students (Chamorro-Premuzic and Furnham, 2005). Additionally, it is often assumed that there is a logical relation between behaviors underlying some facets of Conscientiousness and academic performance. For example, it seems likely that students who are organized, hard-working, and achievement-oriented will perform better at typical academic tasks than those who are not.

Conscientious students concentrate on only a couple of goals and strive hard to achieve them. They are predisposed to being organized, exacting, disciplined, diligent, dependable, methodical, and purposeful. Conscientiousness has been linked to educational achievement and particularly to the will to achieve (Howard and Howard, 1998). Blickle (1996) has demonstrated that conscientiousness is related to learning outcome mediated by learning strategies. Conscientious students are good at organizing their work, managing

their time and studying hard with clear goals (Entwistle and Tait, 1996). They have an intrinsic motivation and a positive attitude (Entwistle, 1988). Students who are low in conscientiousness tend to be less careful, less focused and more likely to be distracted from a task. Individuals who are high on conscientiousness perform better than do those who are low in conscientiousness (Barrick and Mount, 1991).

Conscientiousness will be positively and significantly related to academic performance. This would confirm the results of several recent studies that reported significant associations between these variables (Blickle, 1996; Busato et al., 2000; De Raad and Schouwenburg, 1996). At the broadest level, conscientiousness has been found to be positively associated with GPA, indicating that conscientious students tend to perform better academically than do less conscientiousness students (Bauer and Liang, 2003, Chamorro-Premuzic and Furnham, 2003, Conard, 2006, De Fruyt and Mervielde, 1996, Goff and Ackerman, 1992)

According to the result of 97 respondents from PSDC's Technical College who completed the Credo Personality Profiling, it showed that fifty five (55%) or half of the respondant showed a preference for Cluster IV personality which is representing Agreeableness and cooperative which was then followed by Openness (Cluster II), and then by Stableness (Cluster I). The correlation between personality trait and previous academic achievement (i.e. low, medium, high) is not statistically significant because its respective significant value is less than 0.05. Correlation coefficient is also very small (r_s = 0.045) which means that the personality trait only accounts for 0.2% of the variability in academic achievement. In other words, that there is no relationship between personality trait and academic achievement.

Conscientiousness almost invariably has emerged as the foremost personality factor in educational and occupational research (Barrick et al., 2001; Chamorro-Premuzic & Furnham, 2003; De Raad, 2000; De Raad & Schouwenburg, 1996; Furgeson, Sanders,O'Hehir, & James, 2000; McKenzie et al., 2004; Mount et al., 1998; Phillips et al., 2003;Salgado, 2002). Broadly, conscientiousness relates to self-control, namely, the ability

to resist impulses (Costa & McCrae, 1992). Conscientiousness governs the ability to plan, organize, and execute tasks. Conscientious individuals are goal focused, strong willed, and determined. There is a strong link between conscientiousness and time efficiency (Kelly & Johnson,2005). Conscientiousness is associated with perfectionism, although it tends to be linked with self-oriented or adaptive aspects of perfectionism (Hill, McIntire, & Bacharach,1997). Costa and McCrae asserted that high conscientiousness can result in excessive fastidiousness or workaholic behavior.

4.5 CONCLUSION

The main goal of this study was to examine the relationship between personality and academic achievement and to give an understanding to the low achiever students on how stress affects their body and brain. By practicing relaxation techniques, the students can be trained to control excessive arousal brought on by any stressful situations. At the same time while playing the game, the students have to stay focused and maintain concentration which contributes to better performance and self regulated. As a result they achieve better control of psycho-physiological state, effective coping with anxiety and better performance. The students can learn the skills of relaxation and will be ready to control them, manage their emotions, and yet change their undesired behavior.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

This chapter summarizes the research's outcomes and recommendations for further work to be carried out. This chapter also highlights the contribution of the findings to new knowledge and applications. Scope for future research is also discussed based on the results and findings and the limitation faced in carrying out this research.

5.2 LIMITATION

The results of this study should be interpreted with caution due to small sample size, lack of diversity and conducted in a single technical college. Further study, therefore, utilized larger sample size. Biofeedback Computer Games Based Training device used in the study only recorded heart rate measures recorded from the photoplethysmograph sensor. As the respiration rate is a crucial parameter in resonant breathing biofeedback, thus the future study used a more sophisticated biofeedback system device which provided wider features and more quantitative measurement of cardiovascular and respiratory system.

A second limitation in this study concern generalizability of the study is limited to the PSDC's college students and may not be representative of the Malaysian Technical student in other higher learning institutions. Other limitation in this study that is other factor contributes to academic performance except personality traits are not measured by

the instrument. Other limitation of this study is because only focuses on academic achievement which is related to CGPA of the students. problem with using GPA is that it is multifaceted (Paunonen & Nicol,2001) and affected by several things.

For those student who have low academic achievement they should improve their personality by more focusing and be a self-regulated student by practicing a lot in Biofeedback Computer Game-based Training. It is because while playing the game, the sensitive devices pick up signals from the body and translate them to information displayed on the screen. From the information, it will help the sample to aware of the result and attempt to help them controlling their physiological state. When they know the result as information, then, they have to learn how to control their physiological function, their capacity to relax and improve concentration over time until their reach the desired result. The biofeedback approach is oriented toward helping the individual learn skills which empower him or her to take greater self responsibility for health and all the other dimensions of functional life. It is not a treatment or therapy. It is a coaching and training process.

5.3 CONCLUSION

This research investigated is there any relationship between personality and academic performance for Technical College's students and how rehabilitation module may improve the academic performance of the students. Based on the research, a systematic analysis of personality predictors of academic performance could have several benefits which are:

a) It could help increase the generalizability of the personality-Performance relationship into academic settings.

b) It could help researchers understand personality contributions to academic performance.

c) It may lead to efforts aimed at improving an individual's subsequent performance in college and in the work force.

d) To help the student to predict their own trait of personality and to make the

student more successful, satisfied and productive because they are doing what comes naturally to the person and helping the to know their strength or weakness.

Drucker (1989) writes that education seems to play a very important roles in preparing students for their future. This future include students participation in their communities, their ability to raise family and enjoy opportunity to enjoy the fruit of their labour. Moreover, the educational system seems to strengthen the value of a society within its members, to deepen role specific behavior of members of a society as well as to reinforce students personalities which are reflected in their behavior (Mc Coy, 1990).

In general, by frequently practicing method in rehabilitation module, it will help the students to self manage emotions and academic performance which is able to build up the emotional competencies so that they are more confident and energetic about their learning abilities. This module teaches the students a variety of skills to help them manage any stress or emotional instability they might experience. It is also to test applicability of the module in influencing personality in improving academic performance.

The organizational culture and environment influence the way lectures are conducted in PSDC which in turn contributed ti the development of students' personality and attitude. Perhaps the role of PSDC is one of exposing students to different points of view and providing guidance in developing students potential growth, personality, leadership and individuality. This can be achieved through debates, class discussion, public speaking and many more.

However, the findings need to be interpreted with caution due to small size of sample and by using only one personality profiling which is credo Personality Profiling. The current finding represents type of personality from one personality profiling questionnaire. However, to make it more successful other types of personality profiling should be considered.

The findings of the study indicate that students differ in their personality and therefore in their academic performance and behavior. Since personality develops over time, i.e., from one's childhood to present time, it could not be concluded how much PSDC could prepare their students for overall their academic performance.

5.4 RECOMMENDATION

The present study was limited to one educational institution. However, investigating the questions posed in this section upon a more diverse sample would increase the external validity of the results. A wide-scale study with samples from several different of educational institution would enhance the generalizability of the results and the utility of the current research project. Additionally, incorporating independent measures of academic performance would reinforce the study's validity. Moreover, previous research involving many participants supported the conclusions of this study. The current study not only contributes to the pertinent body of literature, but may also encourage further research.

Rehabilitation Module in this research is based on Rational Emotive Behavior Therapy (REBT) technique which is also incorporating with Biofeedback Computer Games Based Training. So far, there was no research done by combination both methods as a complementary tool in assessing emotional and feeling to help the students manage their stress or emotional instability. According to Mohd Ghani (2009), thus a research must be done by incorporating the behavior cognitive way as being used in this research into more variety of tools such as bio-feedback and human energy field in accessing undergraduates study methods. By using both methods, it would be able to determine factors that may affect students' difficulty in academic and also may provide a treatment to them. Research has shown that emotional factors are known to be significant in study and work performance. A strong emotion has influence on work performance. Individuals who have a higher power of concentration will produce better performance as compared to low. Those who have lower emotion will easily feel lethargic, be less active and will have a lower concentration power in carrying out a task. One of the current techniques used to measure emotional performance is through biofeedback (Abdul Wahab, et.al, 2008). Biofeedback

technique can be defined as measuring emotional changes physiologically. Through this biofeedback technique, physiological changes are measured through the use of biofeedback sensors which are connected to a computer. From the physiological changes, the device and computer will be able to measure and interprets the rate of emotional changes.

This study did not look at the students' external academic factors such as study environment, lecturer's performance, subject matter familiarities and many more academic performance influence factors. This is because of limitation of time and inconsistency of environmental factors to the academic performance. However, the study shows that, if the students are able to control their emotional performance and do change their internal factors are also able to improve their academic performance. This is due important to help students improve their academic performance. In the academic improvement programmed, such factors needs to be considered. Thus taking in consideration too many factors as an influence factors to academic performance is useless and requires more time. The more important to use the most influence factors at improving academic performance that is emotion and behavior.

By utilizing the modalities of biofeedback and relaxation skills training, PSDC'S college can provide students with a valuable resource that teaches them how to monitor and regulate their response to stress. In this way students experiencing stress can become more efficacious in reducing or alleviating the severity of their symptoms, strengthen their immune systems, and become more empowered to better manage their personal wellness. Regular practice of relaxation reinforces what is learned during the session and facilitates generalization of the relaxation response. In this way individuals learn to heighten body awareness and reduce physiological arousal leading to more automatic relaxation (Andrasik, 1990). Thus, individuals are able to develop valuable self-regulation skills that help to relax the central nervous system, decrease sympathetic arousal, and help retrain the autonomic nervous system producing homeostasis and supporting general health and well-being and may contributes to a better academic performance.

It is recommended that further research be conducted on this topic by using larger sample size, better instrument and other group of respondents. The recommendation made due to the result that showed a weak correlation. Other variables such as the course subject, family background, teaching method and lecturer personality should be considered. Future studies might expand the scope of research on academic performance to include areas such as intellectual ability and motivation, absenteeism, degree of social interaction into college and so forth.

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APPENDIX A1

Self Help Form

UMP

APPENDIX A2

Categories of Typically Unhelpful Beliefs

Categories of Typically Unhelpful Beliefs

- Automatic thoughts – stream of thinking that coexists with a more manifest stream of thought -; interpretation of a situation often expressed in automatic thoughts influences the subsequent emotion, behavior, and physiological response;
- Intermediate beliefs – deeper, often unarticulated ideas or understandings that students have about themselves, others, and their personal world, which give rise to specific automatic thoughts;
- Core beliefs (i.e., schemas) – one's most central ideas about the self.

  First, the students should focus on identifying and modifying automatic thoughts, and later on the intermediate and core beliefs. If the automatic thoughts fall into any of the following categories of common thinking errors we are prone to making when we are not feeling comfortable in a particular situation or when they are experiencing unpleasant or negative feelings and sensations. These errors include:

  a. All-or nothing thinking / Black-and-white thinking. This involves seeing things in black and white (in extreme terms). That is, situations or circumstances are interpreted as being good or bad, positive or negative. There is no middle/common ground.

  b. Over generalizing. This type of thinking involves placing a lot of importance on one single negative experience, to the point where you see one negative experience as being a sign for a never-ending pattern of negative events that you forecast (expect) to face in the near future.

  c. Mental Filter. This type of thinking involves picking out a single negative detail from an unpleasant experience you may have had, and then dwelling exclusively on this negative detail. That is, you

ignore the bigger figure and 'filter out' any positive aspects of the event.

d. Mind-Reading. This error involves thinking that you know what other people are thinking and feeling and why they act (or behave) the way they do, even without asking them.

e. Catastrophizing – Magnifying events out of proportion. This thinking error involves exaggerating the importance of things, especially negative situations. You make a big issue out of one negative experience.

f. Minimizing (down-playing) the Positive. This thinking error involves downplaying, ignoring or 'minimizing' your own, or other people's strengths and assets, or a positive event or situation that you have experienced.

g. Personalization. This thinking error involves taking responsibility or inappropriately blaming yourself for the cause of a negative experience which often may be beyond your own control.

h. Jumping to Conclusions. This thinking error involves reaching a decision or interpreting a situation in a negative manner based on no definitive (certain) facts, or where the evidence actually supports the contrary (opposite) conclusion.

i. Blaming. This thinking error involves blaming yourself for other people's troubles. Alternatively, you hold other people responsible for your troubles and misadventures.

APPENDIX A3

Working Notebook

UMP

APPENDIX A4

Credo Personality Type Profiling

Personality Colours	**Basic Behavioural Model**	**Learning Styles - Personal Values & Needs**	**Competencies Model**	**The Eight C's Of Wholebrain Thinking**
Brown **Stableness & Optimism**	• Optimist • Stabiliser • Consultant • Pragmatist • Proactivist • Calmer • Mentor • Realist	• More Reflective/ Auditory • Need calmness and Quiet • More Intelectual/ Conseptual • Independent learner/ self directed • Avoid Highly Emotional Trainer	• Perceptual Objective • Manages own life & Health • Work calmly on pressure • Clarifies vision, value and goals • Assess own strengths and weekness	• Realistic • Pragmatic • Optimistic • Consultative • Calm
Yellow **Imaginative & Openness**	• Conceptualise • Innovator • Originator • Explorer • Inventor • Visioner • Startegist • Idealist	• Divergent • More Chaotic • Like theories • More Visual Stimuli • Unending Curiosity • Ask Lots of Questions • Non structured or Sequential • Adventure or Outdoor Learning • Wants variety Of	• Willing to experiment and take risks • Open to new ideas or method • Creative & innovative • Responsive to change • Make things happen • Thinks strategically • Take initiative • Flexible thinking • Being pro-active	• Visionary • Strategic • Divergent • Unstructured • Intuitive

		pace & method	• Gets the big picture	
Red **Sociability & Expressive**	• Entertainer • Motivator • Socialiser • Persuader • Energiser • Inspirer • Extravert • Exciter	• Must Be Able To Speak • Likes background music • People Interaction • Active Learning • More Kinesthetic • Multi-Sensory • Seeks Activities • Group Activities	• Shares values • Develops others • Able to influence others • Communicate effectively • Communicate assertively • Making presentation effectively • Coaches, counsels and develop others • Shares concern with those who need to know	• Motivational • Inspirational • Emotional • Expressive • Excited
Purple **Agreeableness & Cooperative**	• Compromiser • Harmoniser • Facilitator • Humble • Accomodator • Caunsellor • Moralist • Modest	• Seek high level of cooperation • Dislike competitive situation • Comfortable in a small group • Value Driven • Need low stress environment • More Kinesthetic • Acceleration learning	• Flexible and adaptive to others needs • Listen interactively with emphaty • Value, integriti, honesty and commitment • Inter-cultural sensitivity • Manage diversity • Establish rapport and harmony coorperate • Negotiate “win-win’ outcome • Manage	• Caring • Concerned • Empathetic • Moralistic

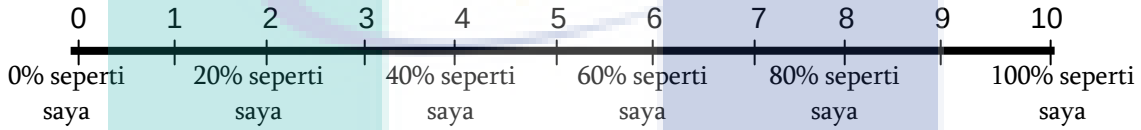
			Conflict	
Green **Conscientiousness & Dependability**	• Traditionalist • Consolidator • Bereaucrat • Organiser • Completor • Conserver • Introvert • Planner	• Likes Detail Guideline • Can delay gratification • Needs Information • Logical Sequence • Needs Structure • Will listen well • Wants to finish • Learns alone • Will persist	• Quality assurance • Working Efficiently • Meeting deadline • Accountability & transparency • Accept authority & Responsibility • Create system for nurturing talent • Understand policies, system & procedures • Manage group processes to achive productive meeting	• Conservative • Cautious • Sequential • Structured • Organized
Blue **Dominance & Resoluteness**	• Cynic • Driver • Sceptic • Director • Autocrat • Governor • Influencer • Competitor	• Factual • Concrete • Convergent • Task Goal Focus • Can be very skeptical • Can work quietly on own • Seek proof and evidence of theories	• Goal setting • Priorities setting • Decision making • Literate in use of IT • Has financial ability • Cause effect thinking • Give objective feedback • Has technically know how • Delegating and empowering	• Convergent • Concrete • Logical • Analytic • Competitive

APPENDIX A5

Credo Personality Profiling Questionnaires

JELASKAN SKOR SIKAP ANDA (1 – 10) TERHADAP KENYATAAN INI

Berikut adalah kenyataan-kenyataan terhadap sikap. Berikan skor anda antara 1 hingga 10 berdasarkan kepada skala yang diberikan di bawah



	Kenyataan	I	II	III	IV	V	VI
1.	Meyakinkan dan pandai memujuk						
2.	Perlu berada di samping orang						
3.	Bersedia bekerjasama dan memberi pertolongan						
4.	Bermatlamatkan pencapaian						
5.	Mengutamakan hubungan yang harmoni						
6.	Yakin diri dan kawalan diri						
7.	Menyukai autoriti dan kuasa						
8.	Suka bergaul dan ramah						
9.	Mengutamakan keselesaan						
10.	Pendesak dan berasaskan matlamat						
11.	Peka						
12.	Berupaya mengawal diri						
13.	Pendengar yang baik						
14.	Memulakan sesuatu perkara						
15.	Memahami perasaan orang lain dan bertimbang rasa						
16.	Penuh bertenaga dan penuh minat						
17.	Berasaskan tugasan						
18.	Senang untuk diajak berkawan						
19.	Berstruktur dan boleh diramal						
20.	Kuat bekerja dan rajin						
21.	Sentiasa bertindak pantas						
22.	Dapat menyuarakan pendapat dengan mudah						
23.	Penyayang dan memberi galakan						
24.	Suka mempengaruhi orang lain						
25.	Suka berkongsi ilmu						
26.	Suka sesuatu yang menurut susunan						

27.	Dapat menerima idea baru dengan terbuka						
28.	Tenang, tidak mudah marah dan gentar						
29.	Berani dan yakin diri						
30.	Dipercayai orang lain						
31.	Optimistik dan positif						
32.	Sukakan kepada seni dan kesenian						
33.	Pendiam dan tidak ramah						
34.	Suka mempelajari atau mengetahui dan suka bertanya						
35.	Tegas dan berfikiran teguh						
36.	Peramah dan dapat menunjukkan perasaan atau fikiran						
37.	Boleh diharap dan boleh dipercayai						
38.	Stabil dan boleh diramal						
39.	Suka berkongsi perasaan						
40.	Berani mengambil risiko						
41.	Dapat menyesuaikan diri dan boleh berubah mengikut keadaan						
42.	Teratur dan sistematik						
43.	Suka sesuatu yang kemas, teratur dan tersusun						
44.	Menumpukan daya usaha terhadap peluang						
45.	Teliti dan produktif						
46.	Ceria						
47.	Tegas dalam membuat keputusan dan berazam						
48.	Baik hati dan menyenangkan						
49.	Berwawasan dan berfikiran ke hadapan						
50.	Bertimbang rasa dan belas kasihan						
51.	Ceria dan periang						
52.	Menggunakan dan mempercayai gerak hati						
53.	Mencari pembaharuan dan kepelbagaian						
54.	Praktikal dan pragmatik						
55.	Berfikiran secara realistik						
56.	Bertindak secara spontan						
57.	Suka nombor dan penaksiran secara kuantiti						
58.	Mempunyai daya imaginasi dan artistik						
59.	Memberi perhatian terhadap hal yang sekecil-kecilnya						
60.	Menyukai muzik dan irama						
61.	Rasional						
62.	Melihat masalah sebagai peluang						
63.	Terperinci dan tepat						
64.	Berfikiran secara strategik						
65.	Melihat halangan sebagai cabaran						
66.	Dapat memberi perhatian dan fokus						
67.	Kreatif dan inovatif						

68.	Berdasarkan fakta dan menggunakan analisis	■	■	■	■	■	
69.	Beretika dan bermoral	■	■	■		■	■
70.	Dapat memberi idea-idea yang baru dan asli	■		■	■	■	■
71.	Sukakan aktiviti dan pergerakan	■	■		■	■	■
72.	Mencuba idea dan benda baharu	■		■	■	■	■

Nama:	No Kad Pengenalan:
Jantina / umur:	Bangsa:
Telefon:	Tarikh:

Sila tinggalkan Ruangan ini

		I	II	III	IV	V	VI
1	Jumlah Skor Bahagian A						
2	Jumlah Skor Bahagian B						
3	Jumlah Skor Bahagian C						
4	Jumlah Skor A+B+C						
5	Peratusan dibahagi						

APPENDIX A6

Conference Paper

Published / Organizer	**Title**	**Date**	**Name Of Conference**
a) National Library of Malaysia Online Public Access Catalogue University Technical Melaka (UTEM)	A Study On The Relationship Between Personality Traits And Academic Achievement Of Technical College's Students	26-28 November 2007	International Conference On engineering & ICT **(ICEI 07)**
b) International Islamic University Malaysia (IIUM)	Behaviour Modification using Biofeedback Computer Based Training in the Prevention of Academic Low Achievement for Technical College Student	13-15 May 2008	International Conference on Engineering Professional Ethics and Education **(ICEPEE '08)**
c) University Kebangsaan Malaysia (UKM)	Personality Traits, Academic Achievement And Biofeedback Computer Based Training In The Prevention Of Academic Low Achievement Of College Students	26-27 August 2008	International Conference on Learner Diversity (**ICELD 2008**)
d) University Malaysia Pahang (UMP)	MCBE-REBT Module For Betterman Of Academic Performance Among Technical College Students	2009	National Conference of Post Graduate Research **(NCON-PGR 2009)**