

**THE DEVELOPMENT OF THAI-PSYCHOLOGICAL CAPITAL
INVENTORY COMPUTERIZED VERSION**

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ABSTRACT

The research aimed to evaluate the computerized version of Thai-psychological capital inventory by studying the internal consistency reliability analysis. Correlation and satisfaction in the Thai-psychological capital inventory computerized version was determined through a sample of 140 students currently studying in Matthayom 4-6 (Grade 9-12) at Pua school, in Nan Province.

The research found that the computerized version of Thai-psychological capital inventory had internal consistency, reliability at 0.952, while the Thai-psychological capital inventory computerized version have a high positive correlation ($r = .986$), compared with the Thai-psychological capital inventory traditional version had significant difference at $p < 0.01$. The level of satisfaction in using the Thai-psychological capital inventory computerized version showed that satisfaction levels were very satisfied.

The research showed that the Thai-psychological capital inventory computerized version is effective and powerful enough to be an alternative tool to the traditional version in order to assess the psychological capital for Thai.

KEY WORDS: DEVELOPMENT / PSYCHOLOGICAL CAPITAL INVENTORY /
COMPUTERIZED VERSION

64 pages

การพัฒนาแบบประเมินต้นทุนทางจิตวิทยาสำหรับคนไทย รูปแบบคอมพิวเตอร์
THE DEVELOPMENT OF THAI-PSYCHOLOGICAL CAPITAL INVENTORY
COMPUTERIZED VERSION

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บทคัดย่อ

การวิจัยครั้งนี้มีวัตถุประสงค์เพื่อพัฒนาแบบประเมินต้นทุนทางจิตวิทยาสำหรับคนไทย รูปแบบคอมพิวเตอร์ โดยศึกษาค่าความเชื่อมั่นเชิงความสอดคล้องภายใน ค่าสัมประสิทธิ์สหสัมพันธ์และระดับความพึงพอใจในการใช้แบบประเมินต้นทุนทางจิตวิทยาสำหรับคนไทย รูปแบบคอมพิวเตอร์ กลุ่มตัวอย่างที่ใช้ในการวิจัยครั้งนี้คือ นักเรียนชั้นมัธยมศึกษาปีที่ 4-6 โรงเรียนปัว จังหวัดน่าน จำนวน 140 คน

ผลการวิจัยพบว่า แบบประเมินต้นทุนทางจิตวิทยา รูปแบบคอมพิวเตอร์ มีค่าความสอดคล้องภายในรวมทั้งฉบับเท่ากับ 0.952 ในขณะที่เดียวกันค่าสัมประสิทธิ์สหสัมพันธ์ของแบบประเมินต้นทุนทางจิตวิทยาสำหรับคนไทย รูปแบบคอมพิวเตอร์มีความสัมพันธ์เชิงบวกในระดับสูง ($r = .986$) กับแบบประเมินต้นทุนทางจิตวิทยาสำหรับคนไทย รูปแบบเดิม อย่างมีนัยสำคัญทางสถิติที่ระดับ 0.01 ในส่วนของความพึงพอใจต่อการใช้งานแบบประเมินต้นทุนทางจิตวิทยาสำหรับคนไทย รูปแบบคอมพิวเตอร์ พบว่ากลุ่มตัวอย่างมีความพึงพอใจอยู่ในระดับพึงพอใจมาก

จากผลการวิจัยแสดงให้เห็นว่าแบบประเมินต้นทุนทางจิตวิทยาสำหรับคนไทย รูปแบบคอมพิวเตอร์มีประสิทธิภาพเพียงพอที่จะเป็นทางเลือกหนึ่งของเครื่องมือในการประเมินต้นทุนทางจิตวิทยาสำหรับคนไทยต่อไป

64 หน้า

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CHAPTER I

INTRODUCTION

Background and Significance of the Problem

The rapid changes of the world today, as well as communication without borders. Causing uncertainty about the economic, political, social and cultural. Humans Faced to the atmosphere of the competition. The society is constantly changing, so no man can stop to rest or relax, to keep up-to-date changes. All these factors will inevitably influence lifestyle of individuals. However, the material is not the only indicator that a person is happy or a better quality of life. The hard work to redeem for convenience causing fatigue, both physically and mentally. The accumulated stress can undermine happiness in the lives of individuals and may lead to mental illness, which affects the efficiency of the work. Thus preventing by strengthening of the mental health of a person is important. A survey of the population of working age across the world, the World Health Organization (WHO) has indicated that the populations of working age are vulnerable to crashes by working more than 1900 million people around the world. each year to workers suffering from work. more than 160 million people, of which 8 percent of all workers experiencing work stress. In every year there are workers who get sick by working for more than 160 million people. Of this amount 8 percent of all workers experiencing work stress. According to the Mental Health Helpline 1323 in 2014 found that there were 47,780 clients who used this service . For 39,084 people (Age between 15-60) are woking-age population 17,262 male and 21,814 female. The first problem is stress or anxiety is approximately 12,602 people or 32.24 percent. The working age between 26-30 years old is the highest group that consult about stress or anxiety problem for 2,084 people or 5.3 percent. Which if you view at the numbers, it can be seen that there are relatively few. But stress during age may reflect an adjustment to the working age. It was also found that the population of working age who called the hotline service, mental health 1323 more than 9389 people or 24.02 percent have a mental disorder. All of this suggests that stress in the workplace is a major effect on

their capabilities, quality of life and quality of labor and may cause the psychiatric disorder.

The psychological capital consists of components that can be used as immune to psychological problems. There are several kinds of research that studied about the psychological capital is mentioned positive impact on individuals and organizations. A number of empirical research suggests that a positive assessment in the workplace affects the overall well-being of employees. (Luthans, Youssef, Sweetman, & Harms, 2010; Luthans & Harms, 2013) Currently, psychological capital has been an increasing attention by extending the scope of studies and research in several areas. Psychological capital is based on the concept of positive organization behavior (POB) by focusing on individual aspects of positive resource utilization and individual's strengths come into power in creating good and wound repair in mind or something worse in life by focusing on the feelings of the normal people to feel fulfilled in life. Positive organization behavior (POB) is defined as "The study and apply of Human' s positive resources and psychological capital hat can be measured, developed and deal managed effectively to improve performance (Luthans, 2002). Strengthening psychological capital can be used to improve the properties of the Authentic Leadership Development (ALD). (Avolio & Luthans, 2006; Luthans & Avolio, 2003) And there is a research has supported that strengthening the psychological capital of all employees can generate significant beneficial results for the organization. (Larson, M. D., Norman, S. M., Hughes, L. W., & Avey, J. B, 2013) In addition, psychological capital has been predicted satisfaction domains of in life, such as work, relationships, and health. In Thailand, there is a Thai-psychological capital inventory developed by Sucheera Phattharayuttawat. This inventory is intended to measure obvious feature, based on theories that were standardized, and specific content to measure as well as scoring and interpretation by exact statistics. In addition, the Thai-psychological capital inventory also has high reliability ($\alpha = 0.9824$) which are standard in assessing the human' s strength in the elements of psychological capital in the context of Thai.

At present, we can not deny that technology plays in our lives more and more in every way. The technology that contributes to fast, convenient and eliminates errors from the work which is done by humans. Working in various sectors has brought modern technology such as computers used for work and service to serve the people

more and more to enhance performance. In education, computers have been used as a tool for searching knowledge and tools for teaching and learning a lot. As a result, a computer is a tool used widely even at the household level. As the advancement of the technology mentioned above, the researcher is interested in integrating psychological evaluation and computer technology to create a tool that is more efficient in terms of data collection, accuracy in data analysis and reduce the use of resources (time, paper, etc.).

As mentioned, the researcher is interested in the development of the efficiency measurement of The Thai-Psychological Capital Inventory computerized version by integrating a psychological measure of the psychological capital and computer technology. Which high reliability compared with the traditional The Thai-Psychological Capital Inventory and more convenient in use with modern lifestyle of Thai citizens.

Research Hypothesis

1. The computerized version of The Thai-Psychological Capital Inventory will be more effective as it provides high reliability and correlation compared with the traditional one.
2. The samples were satisfied by using the Thai-Psychological Capital Inventory computerized version.

Research Objectives

1. To develop the effective Thai-Psychological Capital Inventory computerized version compared with the Thai-Psychological Capital Inventory paper-pencil version.
2. To determine the level of satisfaction in using the Thai-Psychological Capital Inventory computerized version.

Scope of the Research

Population and Sample

The population used in this study are students between grade 9-12 (Matthayom 4-6) from Pua school, a school under Secondary Educational Service Area Office 37 (Phrae - Nan) which is well-prepped with computer equipment for teaching and has moderns computer lab.

The sample will be chosen by using Cluster Random Sampling from students between grade 9-12 (Matthayom 4-6) from Pua school, a secondary school in the educational service Area Office 37 (Phrae - Nan) as 139 people who volunteer to participate in the study and answer the questionnaire.

Research Materials

1. Thai-Psychological Capital Inventory computerized version which was developed by the researcher.
2. Thai-Psychological Capital Inventory by Sucheera Phattharayuttawat is a self-report questionnaire which contains 44 items.
3. Satisfaction questionnaire with The Thai-Psychological Capital Inventory computerized version.

Benefits

1. Using technology to calculate questionnaire results can reduce human error when processing the score.
2. To be used as a guideline to develop the more effective and modern psychological tools.

Definition of Terms

Psychological Capital

Psychological capital (PSYCAP) is the positive characteristic of individuals which can be measured, develop and enhance their abilities. (Youssef & Luthans, 2007) There are 4 state-like of the PSYCAP including hope, self efficacy, resilience and optimism (Luthans, Youssef & Avolio, 2007).

The development of Thai-psychological capital inventory computerized version

A Computer programs, which was developed from the Thai-Psychological Capital Inventory, which can be processed to calculate scores and results.

Efficiency

The Thai-Psychological Capital Inventory computerized version is being tested by the sample and will be high reliability and a stronger correlation compared with the traditional version.

Satisfaction

The satisfaction level in using the Thai-Psychological Capital Inventory computerized version is strong. This is measured from the Satisfaction Questionnaire in using The Thai-Psychological Capital Inventory computerised version. There are five levels of satisfaction including most satisfied, very satisfied, neutral satisfied, not satisfied and very dissatisfied.

Reliability

Reliability, refers to an ability of a tool to obtain the same score when used with the same person despite different time. In this study, the reliability is measured by Cronbach's alpha which is a way to find internal correlation.

CHAPTER II

THE LITERATURE REVIEW

The objective of this research is to develop the Thai-Psychological Capital Inventory computerized version. The reviewed topics are:

Psychological Capital: PsyCap

- The definition of psychological capital
- The components of the psychological capital
- The important of of psychological capital
- Psychological capital assessment

Thai-Psychological Capital Inventory

- Thai-Psychological Capital Inventory development
- The characteristic of Thai-Psychological Capital Inventory
- The interpretation of Thai-Psychological Capital Inventory

Human computer interaction (HCI)

- The purpose or targets of HCI
- Technical design

Computer Assisted Instructions: CAI

- The definition of computer assisted instructions
- Computer and psychological assessment
- The important characteristic of computer assisted instructions
- The process of developing a computer assisted instructions

Psychological Capital: PsyCap

Psychological capital is the integration of positive psychology resources and positive organizational behavior (POB). The empirical analysis found that the various elements of psychological capital will work together as a complex structure. (Luthans, Avolio, et al., 2007) So the psychological capital is more than the sum of the individual components (hope, efficacy, resilience, and optimism). The underlying fundamentals theory associated with hope, self-efficacy, resilience and optimism is a positive assessment of the situation and the probability of success based on the efforts of inspiration and perseverance. (Luthans, Avolio, et al., 2007, p. 550) Psychological capital is defined as "The development of an individual's positive state of mind". The properties of psychological capital are determined by 1) based on theories and has studies supported 2) measurable 3) being state-like (changeable and can be improved) and 4) Effecting positive attitude, behavior, especially performance. (Luthans, Youssef-Morgan, & Avolio, 2015).

The definition of psychological capital

The formal definition of psychological capital is an individual's positive psychological state which can be improved by having following characteristics (Luthans, Youssef, & Avolio, 2007, p. 3) :

- 1) Self confidence (self-efficacy) can be used when necessary to succeed in a challenging tasks.
- 2) A positive expression (optimism) about succeeding in the current time and in the future.
- 3) There is an effort towards a goal and when in crisis can be redirected toward the goal (hope) to be successful.
- 4) When beset with problems and suffering, individuals can overcome and return to their previous health in order (resilience) to achieve success.

The components of the psychological capital

1. Hope

Hope is a term commonly used in everyday life and hope is a positive resource. How hope affects individuals / teams, community organizations and countries are not clearly understood. There is also confusion between hope and wishful thinking (Lopez, 2013). Snyder has defined hope as the nature of inspiring positively, which is based on the methods and practices that lead to success as follow: 1) agency (goal-directed energy) is the power or motivation to the goal. 2) The pathways (planning to meet goals) are a planned commitment to success (Snyder, Irving, & Anderson, 1991, p. 287) For the agency could be regarded as the intention to be likely to successful or get the desired results. (Snyder, 2000, 2002; Snyder et al., 1996) Snyder's research supports that hope is more than cognitive or thinking which the individual can set the goals that can be successful, but great challenging and it is expected to reach that targets through self-directed, energy and internalized control. So the hope is consists of a willingness to successful and the ability to identify, clarify and implement guidelines to ensure success. (Snyder, 2000) To set to suitable target is not only influenced the motivation, alternative, efforts, and persistence. It also consists of willingness and the ability to design a way to contribute to the successful which is call "pathways" (Latham, 2000) Hope is tightly integrated with the ability of individuals in the imagination of a better future or a real future. As well as the process that caused the relationship or union that make open-ended thinking and ideation, easier to develop new targets, pathways and possibility way in general (Carlsen, Hagen, & Mortensen, 2012).

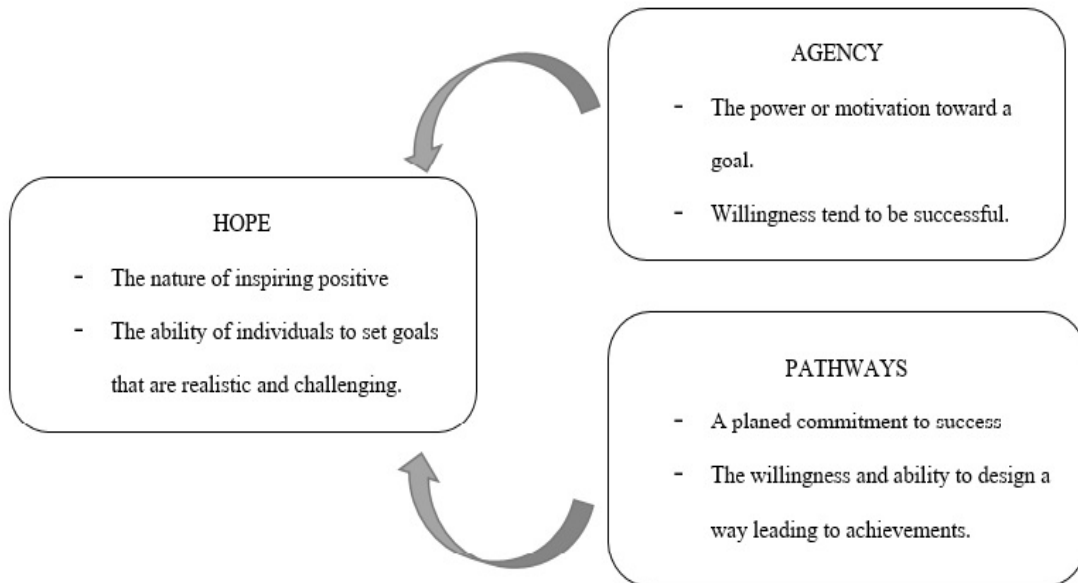


Figure 2.1 The diagram shows the characteristics of hope

Snyder and colleagues have developed Hope Scale to measure hope to use the questions related to how hope reflects a commitment to succeed. Hope may involve desirable attitude towards work, for example, a recent study found that the level of expectation of the production workers at an organization correlated with job satisfaction and organizational commitment. (Larson & Luthans, 2006) Youssef and Luthans (2007) suggests that the hopes of the management and staff of more than 1000 people in a positive way, which involves performance, job satisfaction, work happiness and responsibility to the organizations. According to Ong, Edward & Bergeman (2006) found that individuals with the hope have low stress and less negative emotions and therefore can recover more efficiently than those without hope ($y = 0.328$, $t = -4.97$, $p < 0.001$).

2. Self efficacy

Self-efficacy is the belief of individuals about their own abilities, which involves self-awareness. Although self-efficacy is a kind of the perception, but this perception influences the effective performance and productivity of individuals (Bandura, 2006). In adults especially, people must learn to deal with their own needs

and changes around them. This includes marriage, parenthood, and careers. In early adulthood, there will be demand for safety and security, friends, and relationships in the long term. So the self-efficacy is important to empowering individuals to be successful (Bandura, 1994). Self-efficacy can be changed (Bandura, 2001) when people truly believe in their potential. They will be able to try their best and be replaced by successful. On the other hand, if an individual self-perceives on their capabilities as being lower than their actual abilities, this makes it difficult for them to be successful in challenging tasks. Self-efficacy has 3 dimensions;

- Magnitude is a difficult task that the individual expects to do.
- Strength is confidence in their own abilities.
- Generality is the individual's efficiency of expectations of working with familiar tasks.

Self-efficacy is based on Social Cognitive Theory. Self-efficacy is consistent with the psychological capital in a positive aspect, which is associated with the operation. There are several studies shown that self-efficacy has a direct effect on depression and stress (Maciejewski, Prigerson & Mazure, 2000).

The individuals who have psychological capital and a high level of self-efficacy always challenge themselves with higher goals by finding and voluntarily choosing the difficult task. When faced with suspicion, self-doubt, skepticism, negative feedback, social criticism, obstacles, and repeated failure, the person who has high levels of self-efficacy would be affected only slightly. On the other hand, can cause significant damage to people who have low self-efficacy. (Bandura & Locke, 2003)

3. Resilience

Resilience is focused on how people can control and deal with any burden by themselves. The main characteristics of resilience are the ability of individuals to recover from life crisis and still has positive attitudes, powers, inspirations and hopes for those situations. People who have resilience may see aspects of a problem as not being a problem at all but, instead, as a challenge and they will have a high tolerance for various problems.

Resilience is associated with anxiety and depression, as shown in The Conner-Davidson Resilience Scale, which consists of four dimensions. The dimensions

of self-confidence and optimism are associated most negative with anxiety and depression, followed by the dimension of the problem solving and the pursuit of achievement (Bitsikal, Sharpley, & Pters, 2010). Resilience in psychological capital from Luthans was developed by Wagnild(2009) know as Resilience Scale, which validity is at a higher level. This study has reviewed the literature and in-depth interviews with 24 American women. The core concept is based on the following five cores (Wagnild, 2009).

1. Equanimity: The equilibrium between positive and negative perspective.
2. Meaningfulness: To realize life goals and recognize that life is valuable.
3. Perseverance: The appearance of resistance to misfortune, disaster or discouragement.
4. Existential aloneness: Recognizing the uniqueness of each individual (Understanding the differences between the individual) and understanding that some experiences can be shared or participate in with others but some experiences must be faced alone.
5. Self-reliance: The confidence in an individual' s potential is the ability to believe in oneself, then use the strengths and capabilities to face undesirable circumstances to guide the expression

In Thailand, the Department of Mental Health (DMH, 2009; Tuntatead 2012) has developed Resilience Quotient (RQ) to assess the ability of the individuals in 3 aspects. The first aspect is emotional stability (Equanimity), the second is to have good ideas and social support (family, siblings, and friends). This is consistent with studies of Supara Chaoprecha (2008), who showed that children who were abused will have resilience from internal rather than external factors, but should be aware of a sustainable resilience. The third aspect is troubleshooting by oneself. Self-reliance, self-confidence, and help seeking. These 3 aspects are appropriate to the context of the society in Thailand, so the research was to assess the resilience in terms of 1. The ability to live, despite experiencing a life crisis again. 2. The purpose of life forms. 3. Tring to maintain a balance of emotional stability.

4. Optimism

Psychological capital in the field of optimism is related to the trends in the characteristic of expecting good things to happen in the future also including the positive expectations for the world. (Carver, Scheier, Miller, & Fulford, 2009) Optimism or positive thinking is a strong belief that good things will happen, including the ability to provide good reasons to explain the events that are good or not, whether past or present.

The theories of optimism

1. The theory of dispositional optimism by Carver & Scheier (Carr, 2004; 82-85)

Dispositional optimism is the feeling of confidence that the individual can achieve the aims and limitations of a person's belief when he/she faced life events, whether good or bad. Optimism and pessimism are based on future expectations, which involve motivation theory called the theory of expectation values. Expectations clearly have an impact on a person's mood and behavior.

2. Explanatory optimism or Explanatory style by Seligman

This theory attempts to explain the positive perspective of optimism that is the belief that what happened in the past influences the future expectations and explanatory style and the belief that good events occurred from optimism, emotional stability, and diversity of the reason behind the events. For bad events, individuals should consider that occurrence under conditions that can not be controlled from the outside, and bad things are just temporary, not permanent and do not have a long-term impact on our lives. This belief is the perspective to self, the world, and the future by focusing on the opportunities and hope around us. Hope gives a man an opportunity to manage or change for the better.

Thus, an optimistic person has the capacity to enjoy the present, have lively emotions, have less control by accepting a risk and other differences, expressing gratitude and appreciation for others, disregarding the conflict/interfere targets or changes and increases in the chances of success. Scheier & Carver has developed a positive assessment, called The life orientation test with a total of 10 questions. This tool was developed to assess the individual differences between optimism and pessimism. The LOT-R has been developed and is compatible with the research on behavior, mood, and health. For example, Explanatory Style relating to Adversity

Quotient ($r = 0.21, p < 0.05$) (Johnson, 2005) and optimism can predict the success in changing cardiac health. This was used in a rehabilitation program with 22 patients with coronary artery disease (Shepperd, Maroto & Pbert, 1996), and showed predictable performance and accountability of the organization as well (Youssef & Luthans, 2007; Luthans & Youssef, 2007).

From the above it can be concluded about the the psychological capital to the diagram below.

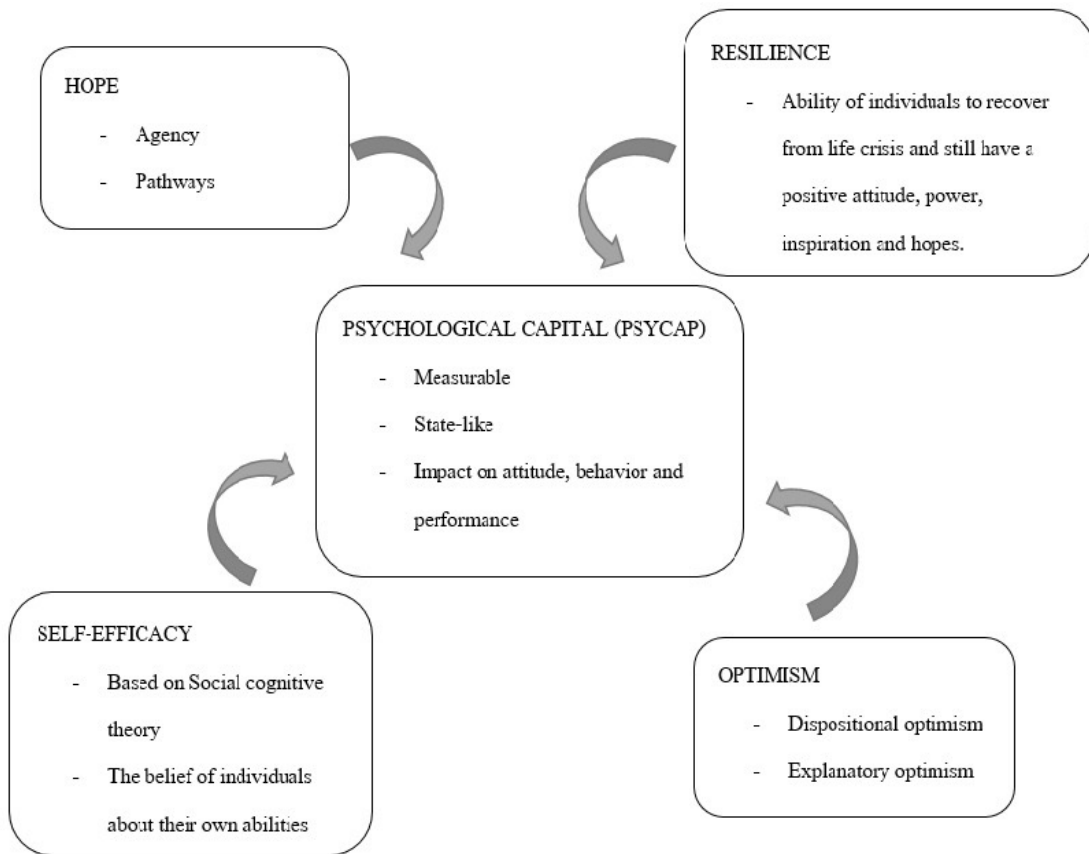


Figure 2.2 The diagram shows conclusions of the psychological capital

Measurement and Evaluation of psychological Capital

PsyCap measurement criteria focused on the positive aspect. (rather than negative), specific to the workplace. (rather than another context) and state-oriented development (rather than trait) which is relative to performance. Several tools for measuring self-efficient, hope, optimism, resilience, positive psychology and other structures are designed, researched and measured the validity. These measurements have been rising substantially from the emergence of the field of positive psychology. To establish a measurement must be taken the basis of several theories used to measure the concentration and the positive psychology resources. For example, Bandura (1997) has created several theories and studies which showed that the effectiveness should be measured in terms of the magnitude and strength. Magnitude refers to The level of difficulty of the task which the individual is expected to do. Measured by the assessors answered yes or no to the questions that they can perform certain tasks on one level or not. The level in this will increase gradually. Strength refers to the degree of certainty that an individual can work hard in each level. Measure the reliability of the respondents by calculated to a percentage or Bandura called the effective in each level (Bandura, 1997, 2012; Locke, Frederick, Lee, & Bobko, 1984; Stajkovic & Luthans, 1998a, 1998b).

However, research has supported the Likert scales were used to measures the magnitude and strength to measure the effectiveness. Likert scales of these structural factors, reliability and validity are similar to the measurement of the effectiveness of magnitude and strength in the traditional method. (Maurer & Pierce, 1998). For example measuring the effectiveness of Parker (1998), which measures the dimensions of the PsyCap. PCQ using the Likert scale in the context of workplace and using for measure PsyCap questionnaires in 3 version (PCQ-24, PCQ-12 and I-PCQ).

From the study about the psychological capital in the past led to the creation of several positive psychology measurements that have reliability and validity by combining a number of multiple questions together. (Lopez & Snyder, 2003) For example, the measurement of optimism has 48 questions coupled with the necessary to measure, predicting results, and control other variables which are usually done in a single questionnaire. Use of a lot of long measurement together causing that measurement to reduce the voluntary response rates and the reliability of each

measurement. Later Scheier and Carver (1985) have brought the optimism assessment to improved by reducing the question to the PCQ editions with only 12 items. The measure of PsyCap structure by using the questions least as much as possible but enough to measure in high reliability and validity and not lower than this. So this is the reason that the PCQ-24 is more popular. But to reduce the length of the PCQ-24, there is PCQ-12 to gather information on PsyCap researches. The short measure does not require the same reliability because the more time used in measurement, the more risk of not being able to cover all dimensions. Whenever users are very knowledgeable about the structure, they can use the short version by regarded as "represent" of the dimension of that measurement. The details of the PCQ-24 and PCQ-12 are as follows.

The development of Psychological Capital Questionnaire: PCQ created from the measurements that have been published and are well-known. It consists of 4 dimensions including Self-efficacy (Parker, 1998), Hope (Snyder et al., 1996), Resilience (Wagnild & Young, 1993) and Optimism.(Scheier & Carver, 1985) It contains 24 items (6 items/dimension), based on the validity and content validity that are considered by experts. The 6 items were selected from the 4 standard questionnaires as mentioned by the experts. It is adjusted to suit the user and the responses by being measured in 6 Likert scale (1 = strongly disagree 2 = disagree 3 = slightly disagree 4 = slightly agree 5 = agree 6 = strongly agree). (1 = strongly disagree 2 = disagree 3 = slightly disagree 4 = slightly agree 5 = agree 6 = strongly agree).

PCQ-12 is shortened from PCQ-24 which contains 12 items divided into 4 domain focus on self-efficacy (3 items), hope (4 items that was divided into 2 performance items and 2 pathway items), resilience (3 items) and optimism (2 items), which Avey et al. selected the 12 items by following the procedures and the criteria for psychological testing of Stanton et al.(2002).

I-PCQ is different from PCQ where I-PCQ create questionnaire by using definitions of self-efficiency, hope, optimism and resilience. Then add the items into the questionnaire which asks assessors to rate the definition of each character which is similar to "someone" (not themselves). In positive situation (e.g., "Someone has a new job"). In negative situation ("Someone makes a mistake at work") and in the natural situation ("Someone talks to his/her supervisor") In addition by the different of the total amount and number of items to measure psychological capital of each version. There

are also differ on the question of negative (3 items in PCQ-24, none in PCQ-12 and I-PCQ) and the number of items that were added (none in PCQ-24 PCQ-12 and 4 items in I-PCQ). (Luthans, Youssef-Morgan, & Avolio, 2015)

The measurements of positive psychology that generally use today were developed and measured the validity in a different context. These measurements are used in the field of the clinic and can not be used directly in the workplace. (Lopez & Snyder, 2003) The prominent of the measurements are to measure their effectiveness and job role of Parker (1998) and Snyder (2000) which offered the measurement of hope specialization by combined 6 dimensions. On the other hand, for creating the resilience's measurement. It's mainly based on the assessment of children and young people. So, despite several documentations in both breadth and depth that supports about PsyCap measurement but most of the evidences are not include the context of working-age. Therefore, its use in such a context, it must be upgraded to be used in such a context, however, the current research in these fields in both breadth and depth on focusing in the workplace.

The Thai-psychological capital inventory

There are 2 editions of the Thai-psychological inventory. The Thai-psychological inventory first edition developed by Haruetaitip Tuntatead in 2012 designed for individual assessment, evaluation and research. It is a self-report questionnaire consisting of five levels of 53 questions divided into six domain as resilience, hope, optimism, self-efficacy, relationship, and pathway. The entire domain is all part of the structure of psychological capital. The purpose of an assessment may also dictate a specific focus in either differentiated domain, has standard theories supported and specific measured as well as scoring and interpretation by clear statistics and high reliability $\alpha = 0.98$.

The second edition of Thai-psychological inventory was developed by Sucheera Phattharayuttawat. (In the process of publication.) From this edition, the inventory was reduced items from 53 items into 44 items by cut 2 domain of relationship and pathway. So the inventory has 4 domain including hope, self-efficacy, resilience, and optimism. The Thai-psychological inventory second edition has been developed and

conducted research with the aged group between 12-87 years old by collected data from 2855 people. The purpose of an assessment may also dictate a specific focus in either differentiated domain, has standard theories supported and specific measured as well as scoring and interpretation by clear statistics and high reliability ($\alpha = 0.9824$).

Assessors will select an answer in five levels (5-rating-scale) as follow:

5 means	absolutely agree
4 means	moderately agree
3 means	agree and disagree sometimes
2 means	moderately disagree
1 means	absolutely disagree

Interpretation of scores

The average of 4.21-5.00	The assessors has psychological capital in very high level.
The average of 3.41-4.20	The assessors has psychological capital in high level.
The average of 2.61-3.40	The assessors has psychological capital in moderate level.
The average of 1.81-2.60	The assessors has psychological capital in low level.
The average of 1.00-1.80	The assessors has psychological capital in very low level

The structure of the Thai-Psychological Capital Inventory

1. Hope, which is measured by Expectancy Theories of Synder.
2. Efficacy was confident in the ability of their own, according to the social learning theory of Bandura (Bandura, 2006) and theories of adult psychological development.
3. Resilience is the ability to recover from suffering based on Resilience-Scale of Wagnild. (Wagnild, 2009)
4. Optimism is the belief that there must be something good going based on dispositional optimism theory and explanatory optimism theory.

The reliability of the Thai-Psychological Capital Inventory

Table 1 Reliability Coefficients of Thai-Psychological Capital Inventory (n=2,855)
(Phattharayuttawat et al., 2016)

Domain	Item-total correlation	α (95% CI)
1. Resilience	.73-.89	.9821 (.9820-.9821)
2. Hope	.75-.81	.9820 (.9819-.9821)
3. Optimism	.76-.89	.9821 (.9819-.9822)
4. Self-efficacy	.71-.91	.9823 (.9821-.9824)

Human computer interaction (HCI)

Human-computer interaction (HCI) is the study of the interaction between humans and computers. This study is associated with many related fields, for example, design, psychology, behavioral science, computer science, etc. The system or application developer must study and try to understand how the user expects in using computer or computer system. Then create a system which response to users' demands as much as possible. These can effect to the happiness and convenience in use. Human-Computer Interaction (HCI) is the part that is separate from the Management Information System (MIS) (Banker et al. 2004; Zhang et al. 2002; Zhang et al. 2005c) "Which focuses on human-information interaction, technology, and performance, especially in business, managerial, organizational, and cultural context" (Zhang et al. 2002).

Principles of Human Computer Interaction

An effective system should provide users a nice feeling of use, understandable utilities, and controllable functions. Therefore, the development of HCI

requires appropriate indications which can be divided to six main principles as following; (Kim, 2015).

1. Understanding of users is the design which considers on user-centered. This principle has been identified as the design that focuses on interaction and interface. It should be able to meet the requirements of target users and should also concentrate to their capability of using the system. In terms of design and development of HCI, sometimes, it may not come from the depth understanding of users. For instance, in some cases, the designer can only conjecture how users will response. However, the HCI designer should understand and learn about the target users details such as gender, age, education level, social status, cultural background, disability and computer Skill. The variation of these may reflect a difference in users' demand. The requirement of people who are visually impaired may differ from that with normal vision.

2. Understanding in tasks is the essential factor which related to the interaction modeling and user analysis. It consists of arranging presentation sequences, presentation information and presentation data which can make the system the most suitable for users. Designers have realized that different users will have different mental models which will be reflected in the structure of the interface to make it easier to use for all users.

3. The interaction design that reduces memory load. This principle, regardless of the natural of human memory. Humans memory consists of 3 components which are Sensory Memory (SM), Short-Term Memory (STM) and Long-Term Memory (LTM). This principle focuses on short-term memory load light in regards to the role of interfaces to provide designs which are convenient and easy to use. For the amount of stimuli that can be found in the STM is in the range of approximately 30 seconds or approximately 7-9 chunk (for example 7 letters, numbers, departments, units, meaning words or groups of meaning words or chunk). Moreover, images, sounds, and meaning are important for the system. Thus, in terms of HCI design, for example, the design of system menu is not complicated. Therefore, choosing proper keywords, continuity of services, intensify notifications and alerts throughout the interactions can enhance the effectiveness of interfaces.

4. The determination of building long-term stability. In this principle, the design still relies upon the natural of human memory to help in system interfaces design.

Application interfaces have been designed in the identical way of the related ones in order to familiarize users with the similar interfaces. This will allow users to use the program or an application easier.

5. The ability of the system to recognize users. This principle refers to the development of a system for user reminding. For example, in online shopping applications, users are required to fill a lot of information including personal information, addresses and credit card number in order to maintain the awareness of the users' working situations, accurate response, information and memories. Then, provide feedback continuously to revive of users' memories and allows users to operate the system easily, which contributes to the impression in using the applications or programs.

6. To prevent errors from the interaction and interface, the system should be designed to avoid confusion and misunderstanding, for example, the design of menu systems should be simple and easy to use in order to reduce errors in the use and offer the convenience for users, which will lead to the satisfaction of use.

7. The natural is the key principle of HCI. The natural reflects the nature of the tasks in humans' daily lives. A perfect HCI design must be concerned about the communication that able to connect effectively between humans and computer.

Human Computer Interaction focus on the 3 elements as follow: (Rees et al. 2001; Raul, 2011)

1. Human-related to the studies of users or groups of users to work together. These will bring the perceptions of users (For example, vision, audience, and touching to the Controlling data transfer, which depending on the users' different skills, restriction, ability to learn and the existing knowledge as well as the natural and cultural background.

2. Computing Systems refers to widely scope of systems including machines and automatic systems.

3. Interaction is the interaction between users and computers, in both software and hardware. For example, text, content, peripherals (keyboard and mouse), etc.

The purpose or targets of HCI

1. The programs or applications' systems, which are designed for the user to be easy to learn and not complicated to use, stimulate interest, motivate the user to use the programs and utilities.
2. The systems have speed processing and effectiveness.
3. The program design intended to reduce errors as much as possible and focus on the accuracy of processing.
4. After the users has used the programs for a long time. They will still remember how to use it or can recognize easily

Computing Environments

Social environment can affect how humans using the computer. Different styles of computing paradigms reflect the difference of social conditions. Cognitive Computing Environment is interested in the knowledge that related to the interaction between humans and computers. This field is a scientific study and knowledge including basic concepts of psychology, for example, learning and solving problems in terms of abilities, strategies, knowledge and styles.

Technical design

In part of interface design, the designers should understand and consider to the characteristics of the users, for example, age, disabilities, attention, the technical skill of the users, etc. In addition, the computer has been used in a variety of environments, which determines cognitive stress levels in different users. The designer should consider the safety of users, for instance, the designer should not use too bright colors, which can irritate the uses' eyes. Moreover, using the appropriate colors can help the program to be more attractive and facilitate to use the program. The effectiveness of colors can be an effective tool. On the other hand, the effect of the inappropriate colors decreases the effectiveness of the program or the satisfaction of the users. The design should observe and understand the whole system. Observation of human behavior and working performance by not overlook the little things can prevent an error in the system. These can help the designers to create the system that serves the users' demands as much as possible to provide the user's satisfaction in using the system.

Graphic User Interface (GUI)

Graphic User Interface is designed to facilitate in using the computer for the users to provide communication with computers via symbols like images. The users can click to select an icon instead of typing the command as ever or select an item on the menu system. The obvious advantage of the GUI is that the users can work with the program without writing the computer commands to operate in each section. Thus, users can be used the program immediately by simply following the program directions which were designed and created by the creator.

Visual Elements

In general, the design of the display is an arrangement of information to achieve interesting (such as illustrations, texts, diagrams, images, tables, animations) in a way that attractive and easy to understand. (Vanderdonckt, 2003, p. 187) McClurg-Genevese (2005) suggested that elements of design are the basic components that can be arranged. These elements of design are working together to define the design principles that reflect the overall impact (Hoffmann & Krauss, 2004). The study of McClurg-Genevese (2005) suggested that elements of the design consist of points, lines, forms (shapes), textures, spaces, colors, typographies, patterns and movements.

Computer Assisted Instructions: CAI

Definition of Computer Assisted Instruction (CAI)

Computer Assisted Instruction or CAI is the course that using computer software. Any course that the user is learned from computer, is called Computer Assisted Instruction (CAI) (Peck & Hannafin, 1988).

From the above, it can be concluded the meaning of "Computer Assisted Instruction" or CAI is to use the computer as a tool to create a computer program to allow students to self-study and learning. The program includes course content, exercises, test, presentation style, which may include color, text, sound, graphics, or animations to attract the users' attention even more. As well as the immediate feedback to the users and also to focus on teaching methods and activities to suit each learner.

However, it needs to be planned to produce a systematic presentation of content in different formats.

The main characteristics of computer-assisted instruction (CAI).

The feature of CAI in 4 aspects.

1. Information refers to content that has been compiled to make the learners to learn or get any skills assigned by the creators. The presentation can be in direct or indirect way.

2. Individualization refers to the responding to the differences between individuals. This is a key aspect of the CAI. Each individual has a different learning. CAI is one of the media types which has been designed in such a way that respond to individual differences as much as possible.

3. Interaction is the interaction between the learners with CAI. The teaching model is the best opportunity for students to interact with teachers as possible.

4. Immediate feedback or providing answer can be considered reinforcing. Providing immediate feedback to learners referring to the complete CAI would need to be tested or assessed the understanding of the learners in the content, or skills-based objectives.

The development process of Computer-Assisted Instruction (CAI)

The development process of Computer-Assisted Instruction has 7 steps as follow:

1. Preparedness: The researchers prepare for computer-assisted instruction development. Therefore, researchers should follow the procedures that are planned for efficiency and continuity as follow:

1.1 Determine the goals and objectives about type and scope of learning in the lessons such as main topics, appendix, exercises and test.

of the main topics, such as the appendix, exercises and quizzes. The objective is to determine the ability to learn and to use, for example. Users can explain or set some examples.

1.2 Collecting resources is to provide resources, including content, presentation style and manner of media.

1.3 The content is from the expert interviews, reading books and other related document.

1.4 The idea is to brainstorm for creative thinking. This development step is one of the important step, which the researchers would need more time. Because this step is impact .on format of the next steps continuously and efficiently.

2. The format of the lessons are as follows:

2.1 Eliminating ideas is to consider all ideas to assess attention, benefit and suitability.

2.2 Conceptual analysis: It is a step to analyze the content, which users must learn. The appropriateness of the content and analysis concept is a step in getting the information that is relevant to the content and the content is clear and effective.

2.3 Description introductory lesson: The research will be compiled and conceptualize and design lessons that are effective in gathering and concepts base on learning theory.

2.4 Processing and pattern updates. The evaluation must be done several times during the period of design. This assessment is a test of users to achieve the goal. Then re-evaluate to obtain the satisfaction and high quality of CAI.

3. Flowchart Lesson: After gathering the information, content, formats and procedures. The researcher conducted the presentatiion diagram and explain the process of using program.

4. Written or edited scenes of the story (Created the storyboard) is a plan to present text, images, media and all multimedia on paper to be presented on the screen namely script writing such as information, questions, feedback, suggestions, photos and movies. These should be assessed and improved Storyboard section of the form and content by the users to monitor content that may cause confusion, unclear or misleading.

5. Create the CAI according to storyboards that were made previously.

6. Create the support tool: Can be divided into four categories including manual for learner, manual for teacher, technical manual and general appendix to achieve clarity for users and quickly troubleshoot program.

7. Evaluation and revision: At the end of the lesson, and all annexes must be evaluated. On the steps of the lesson should be evaluated by observing the behavior of the learners in using the program or interview after use program.

The seventh step in the development of computer assisted instruction is a flexible rules. The modification process is necessary. For example, in some cases, the researcher may collect data and then targeted. The research may adjust priority. After evaluating each proposal, the researcher will be able to improve the necessary arrangements.

Psychological testing and computer technology

Computers are used in psychological assessment over a period longer than 60 years since the 1950s, computers have been first adjusted to psychological assessment. In that period computer was available to scoring, data processing and interpretation of test results. In early 1960s Mayo Clinic group in Rochester, Minnesota wanted to classify a lot of mental patients by using the Minnesota Multiphasic Personality Inventory (MMPI). So they developed an MMPI in the computer model to provide rapid interpretation process and more efficient. During that time, the program has been used to assist in interpreting the data as well. After that computer has been developed to record the frequency and scope to use. In 1964 Piotrowski improve translation Rorschach tests by integrating computer technology with a psychological assessment. And from using a computer program to interpret Rorschach test in this year has led to the invention of the scoring system and interpreted by Exner in 1987, which is still in use today. Testing operations in computer interview were done in 1966 at the University of Wisconsin and have developed steadily. In the 1970s, the computer can display questions on the screen and interact with the keyboard. In 1971 Johnson and Williams have developed a computer that can administer, score, and interpret several psychometric at the Veterans Administration Hospital in Salt Lake City, Utah. During that time, Psychologists began to use computers more in the psychological assessment by setting Mainframe Computer system to store patient data and results from

psychological tests such as the Minnesota Multiphasic Personality Inventory (MMPI), Beck Depression Inventory, intelligence test and memory test, a social history and problem checklist, and. structured mental status examination conducted.

The development of psychological assessment computerized version in Thailand.

- The development of the pictorial Thai quality of life computerized version created by Thanarat Songsomboon in 2007. The results showed that the pictorial Thai quality of life computerized version has overall internal consistency reliability 0.71 and high correlation coefficient ($r = .73$) compare with the paper-pencil version was significant at the 0.01 level.

- The development of the life distress inventory computerized version created by Wiyada Nintranon in 2007. The results showed that the life distress inventory computerized version has overall internal consistency reliability 0.9 and high correlation coefficient ($r = .879$) compare with the paper-pencil version was significant at the 0.01 level.

- The development of the Thai mental health questionnaire computerized version created by Suput Sanjamsai in 2007. The results showed that the Thai mental health questionnaire computerized version has overall internal consistency reliability 0.95 and high correlation coefficient ($r = .92$) compare with the paper-pencil version was significant at the 0.01 level.

CHAPTER III

MATERIALS AND MERTHODOLOGY

This research is to develop the effective Thai-Psychological Capital Inventory computerized version. The Procedure in this research is as follows:

Population and Sample

This research is a pilot study using Thai-Psychological Capital Inventory computerized version. Thus, the population, and the sample must be considered in terms of the availability of computers that are controlled and managed in a systematic way and the cooperation of the school in order to install the program, From the mentioned reasons, the researcher choses Pua school, Nan Province, a school under Secondary Educational Service Area Office 37 (Phrae - Nan) in this research.

Population

The population is the students between grade 9 - 12, study in Pua school, Nan Province, a school under Secondary Educational Service Area Office 37 (Phrae - Nan), which is well-prepped with computer equipments for teaching and computer lab.

Sample

The sample will be chosen by using Cluster Random Sampling from students between grade 9-12 (Matthayom 4-6) from Pua school, a school under Secondary Educational Service Area Office 37 (Phrae - Nan). The sample size can be calculated based on the formula of the Zikmund as follow:

$$n = \frac{Z^2 PQ}{E^2}$$

Where n = sample size
 Z = the standard deviation is set at 95% confidence level (1.96).
 P = The proportion of the population
 $Q = 1-P$ ($Q=0.1$)
 E = sampling of error which is 5% (0.05)

so
$$n = 1.96^2(.9)(.1) / 0.05^2$$

$$= 138.2976$$

Hence, the sample size is 139 people

Inclusion criteria

1. Thai students who study in Pua school between grade 9-12.
2. The participants must be using the computer and accessible.
Willing to cooperate and answer the questionnaire.

Materials of the study

1. The Thai-Psychological Capital Inventory computerized version developed from the original Thai-Psychological Capital Inventory by Sucheera Phattharayuttawat is following:

1.1 Researchers collected data and the contents of the Thai-Psychological Capital Inventory and design the program's presentation.

1.2 Create a story board that including the form of photographs or images displayed in sequence for the purpose of pre-rendered animation, animation, motion graphics sequences or interactive media of the program.

1.3 Developed a program based on the storyboard, according to the chart below.

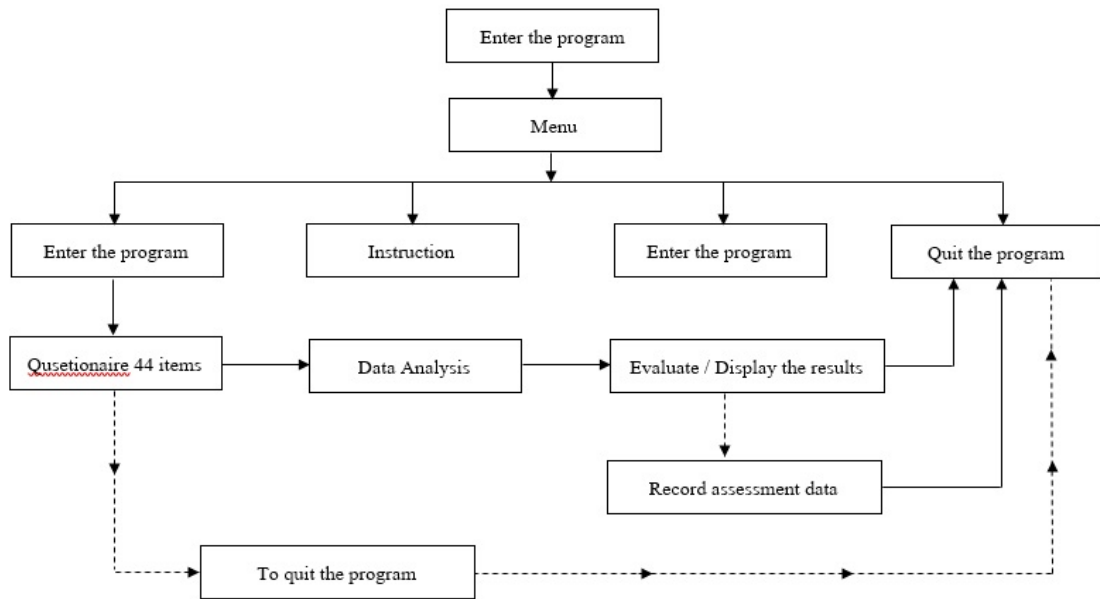


Figure 3.1 The flow charts showing the sequence of program presentation

2. Thai-Psychological Capital Inventory by Sucheera Phattharayuttawat is self-report questionnaire which contains 44 items for assessing 4 domain of similar factors in psychological capital concept including hope, self-efficacy, resilience and optimism.

3. The Satisfaction Questionnaire in using Thai-Psychological Capital Inventory computerized version, develop by the researcher.

Data Collection

1. The researcher contacted Pua school, Nan for permission in order to collect data.

2. Samples were divided into two equal groups. The first group will do The Thai-Psychological Capital Inventory computerized version. Followed by the Thai-Psychological Capital Inventory traditional version. And the second group will do the Thai-Psychological Capital Inventory traditional version, followed by the Thai-Psychological Capital Inventory computerized version.

3. The data were collected and analysed with statistical process to determine the psychometric properties of the Thai-Psychological Capital Inventory computerized version.

Data Analysis

The data were statistical analysed by the SPSS program.

1. Analyse psychometric properties in terms of internal consistency reliability using Cronbach's Alpha.
2. Analyse psychometric properties in terms of correlation coefficient using Pearson's correlation coefficient.
3. Analyse the general information and satisfaction level analysis by descriptive statistics to show Mean (\bar{X}) and S.D.

CHAPTER IV

RESULTS

This research is a pilot study which intends to develop the effectiveness of the Thai-psychological capital inventory computerized version in terms of reliability and correlation compared with the Thai-psychological capital inventory paper-pencil version. In addition, the researcher studies user satisfaction while using the Thai-psychological capital inventory computerized version. The sample used in this research is students who are studying in grade 4-6 at Pua school, Nan Province, Thailand with the following hypothesis:

1. The computerized version of The Thai-Psychological Capital Inventory will be more effective as it provides high reliability and correlation compared with the traditional one.
2. People were satisfied by using the Thai-Psychological Capital Inventory computerized version.

The results of this research are divided into two parts.

Part 1 The process of developing the Thai-Psychological Capital Inventory computerized version.

Part 2 The effectiveness of the Thai-Psychological Capital Inventory computerized version including.

2.1 The reliability of the Thai-Psychological Capital Inventory computerized version and the Thai-Psychological Capital Inventory traditional version.

2.2 The reliability of the Thai-Psychological Capital Inventory computerized version and the Thai-Psychological Capital Inventory traditional version.

2.3 The satisfaction in using the Thai-Psychological Capital Inventory computerized version.

Part 1 The process of developing the Thai-Psychological Capital Inventory computerized version.

The process of designing the program

- The researcher used the program in terms of design, starting by defining the concept of the program then designing the theme (formed in a presentation), background, art work, and layout program presented on each page.



Figure 4.1 shows the first page of the psychological capital inventory computerized version

- Characters design (according to the concept previously defined)

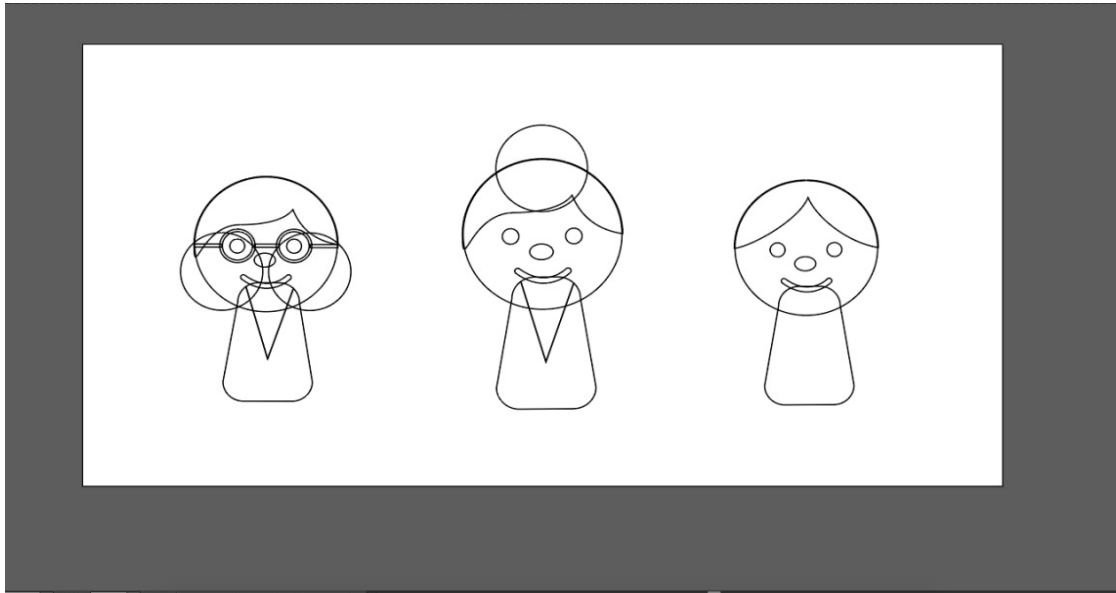


Figure 4.2 shows the process of characteristic design

- Coloured the characters.

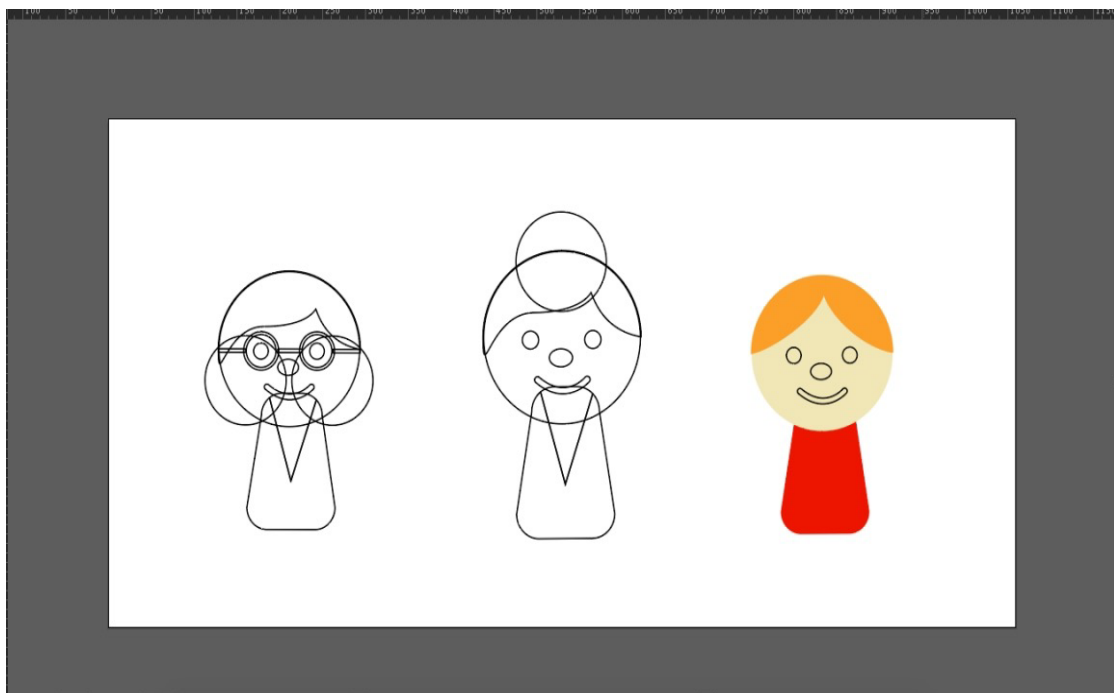


Figure 4.3 The picture of main characters.



Figure 4.4 The process of characters painting.

- After completing the process of character design, they will be made into animations.

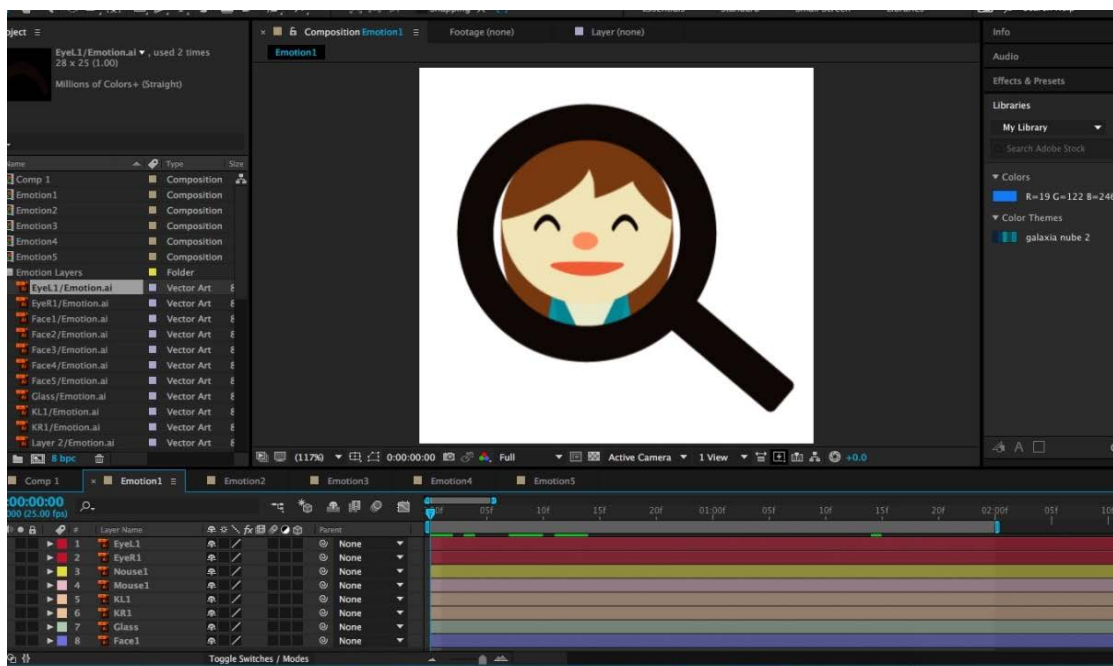


Figure 4.5 shows the first step to creating an animation.

- Render into .png file and convert to a gif image.

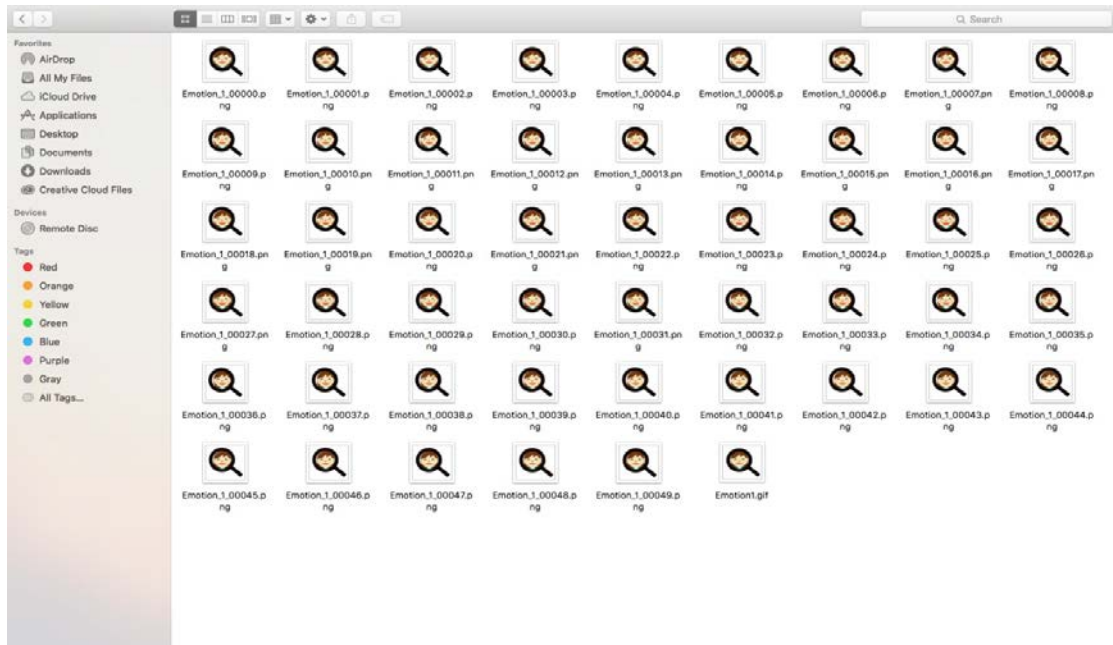


Figure 4.6 shows the second step to creating an animation.

- Make an animated character.



Figure 4.7 shows the third step to creating an animation.

- Export to .gif.

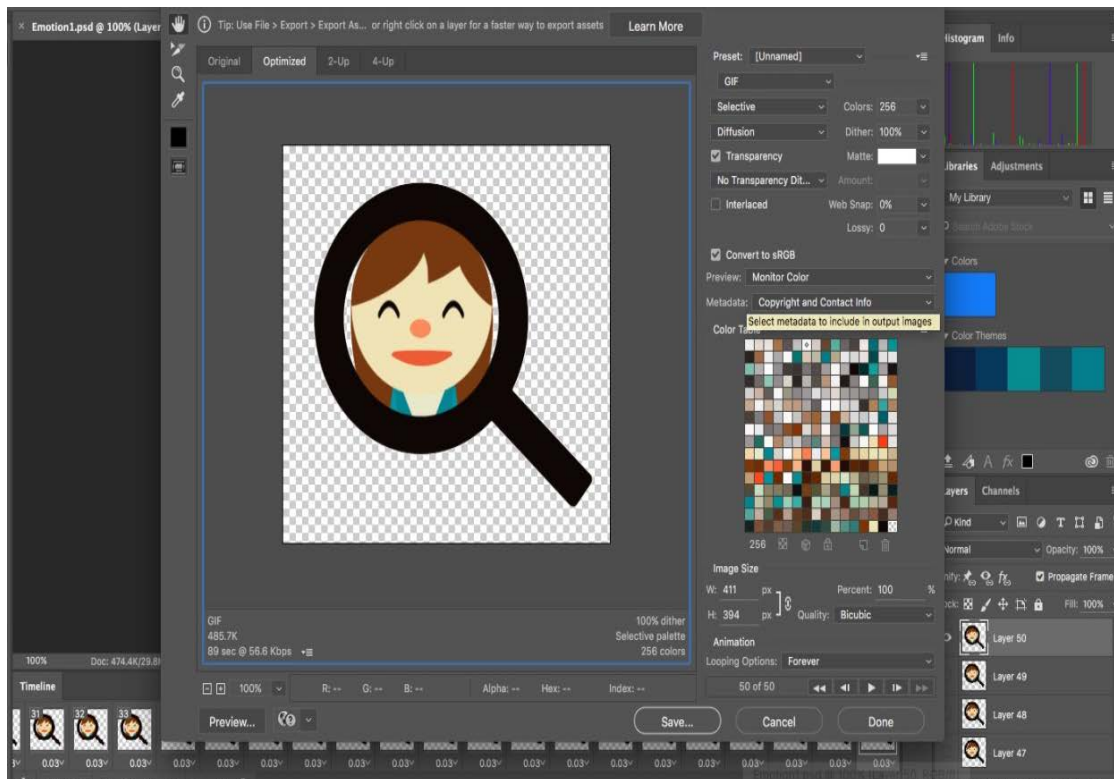


Figure 4.8 shows the final step in the creation of an animation.

Implementing a program from the story board which was created previously. This process can be divided into 3 parts as follow:

1. Import the pictures, art work or any background into the program to create Thai-psychological capital inventory computerized version.

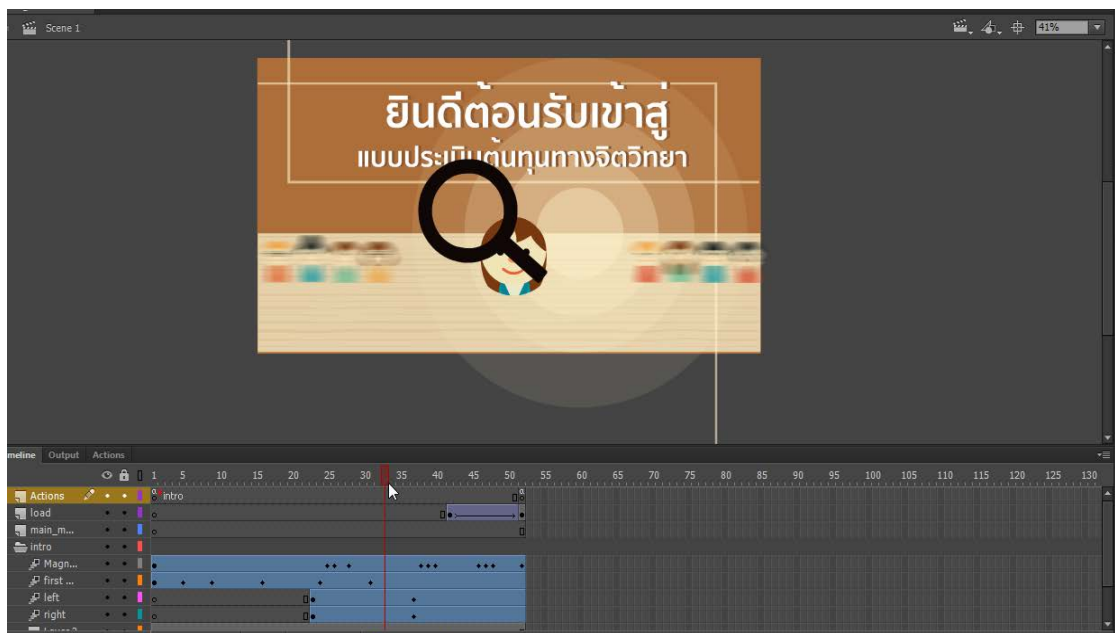


Figure 4.9 Creating the program

2. Created the buttons and commands.
- Created menu buttons and inserted commands of each buttons.



Figure 4.10 The menu buttons

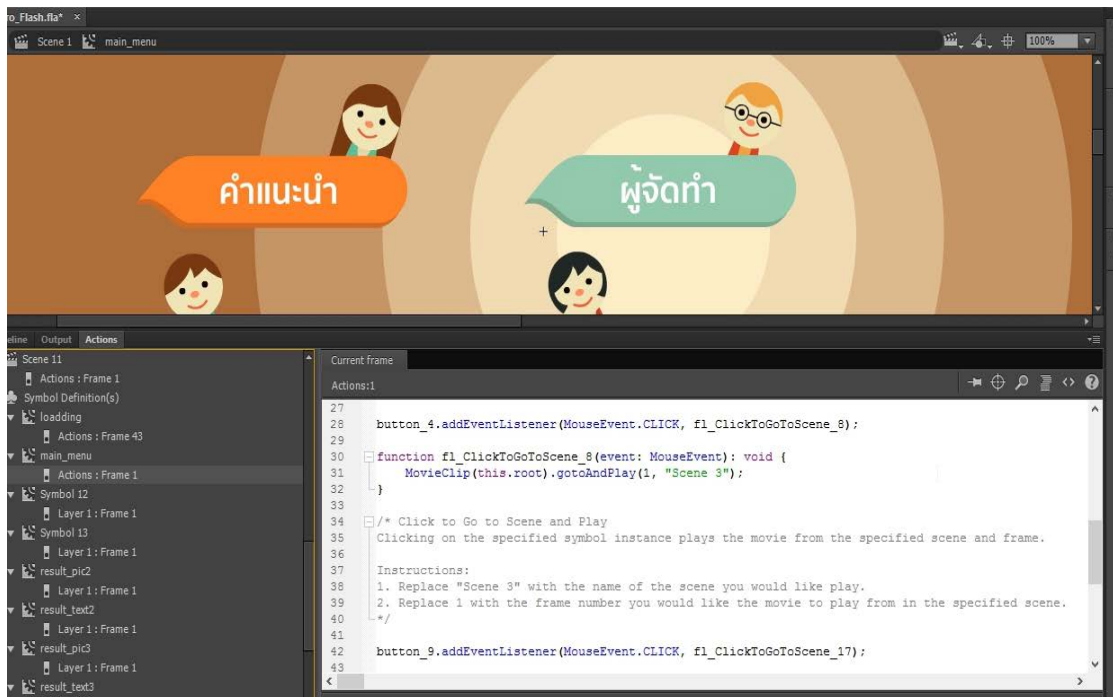


Figure 4.11 The commands of menu buttons

- This picture show the next bottom and back to menu bottom.



Figure 4.12 The commands of next button and back to menu button.

Recording and evaluating data

- Users are instructed to click on the button (absolutely agree, moderately agree, agree and disagree sometimes, moderately disagree, absolutely disagree) in each questions. The program will save the answer from each buttons (5,4,3,2,1 respectively) and stored in temporary variables until the user clicks the “Next” button to confirm the answer. These values will be used for further calculations.

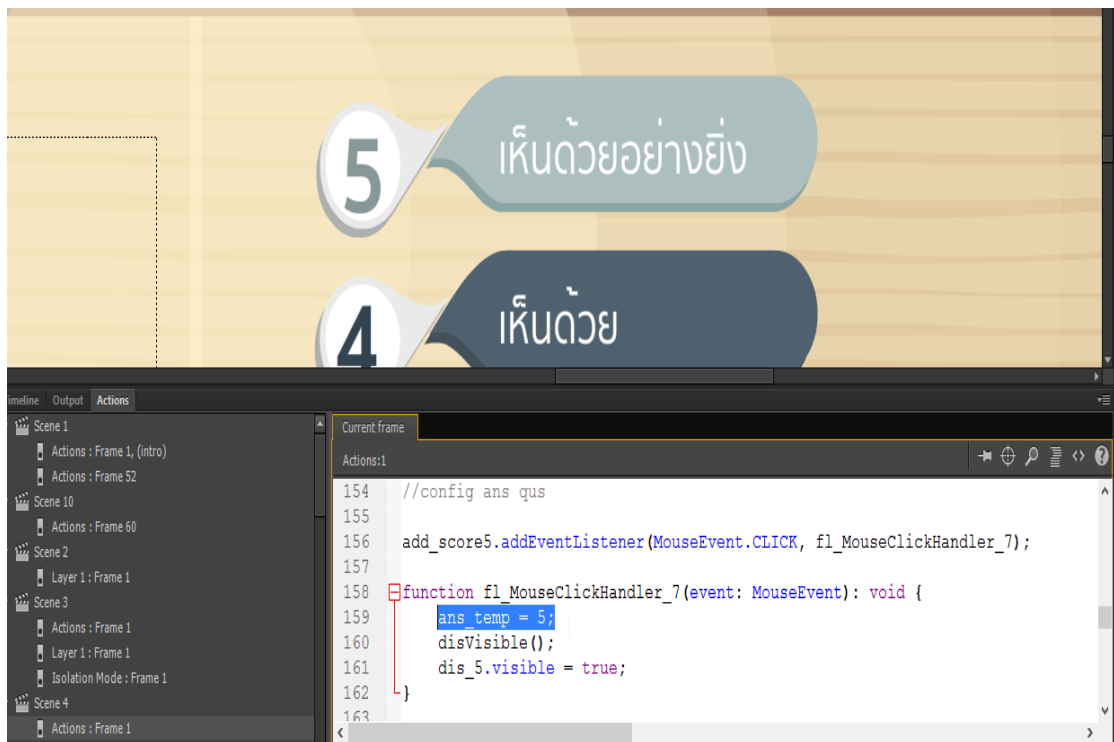


Figure 4.13 The commands of each bottom in the inventory.

- When users click on the “Next” buttons, the program will make values importing of temporary stored in the variable storage answers. This will keep the answer to each question is answered already.

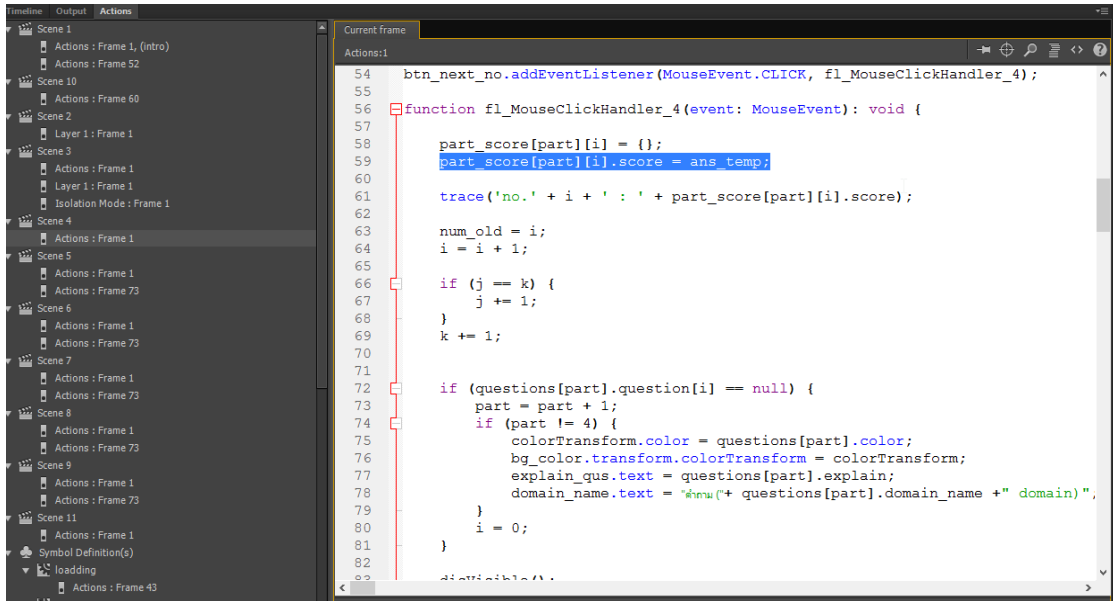


Figure 4.14 The commands to record the users' answers.

- When all questions were completed by users. The program calculates the sum of each dimension and overall sum. The program also records the time, the test was completed in order to save to the report.

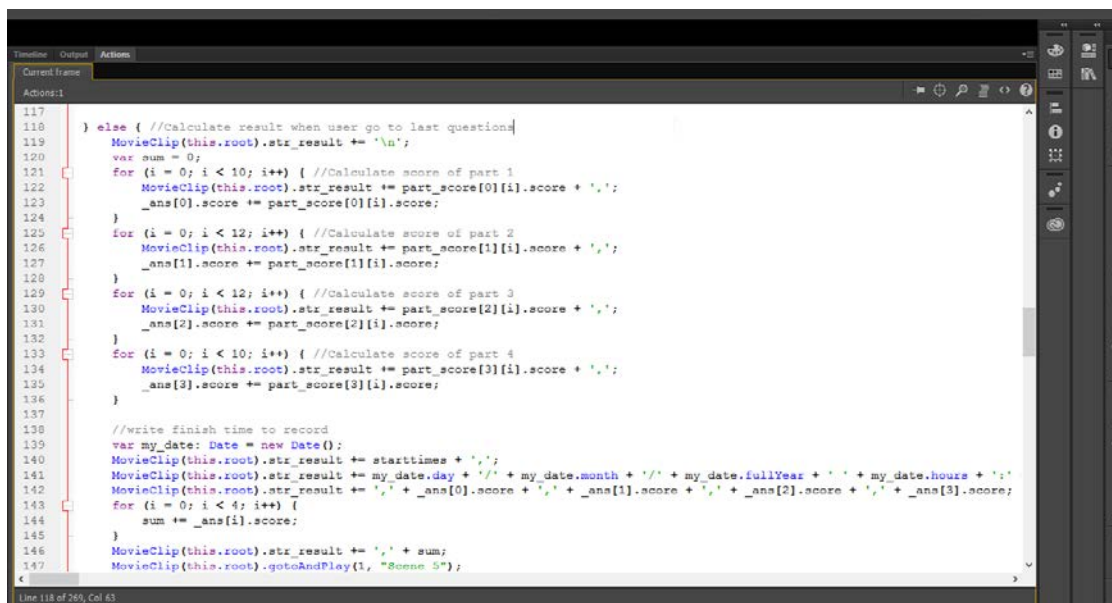
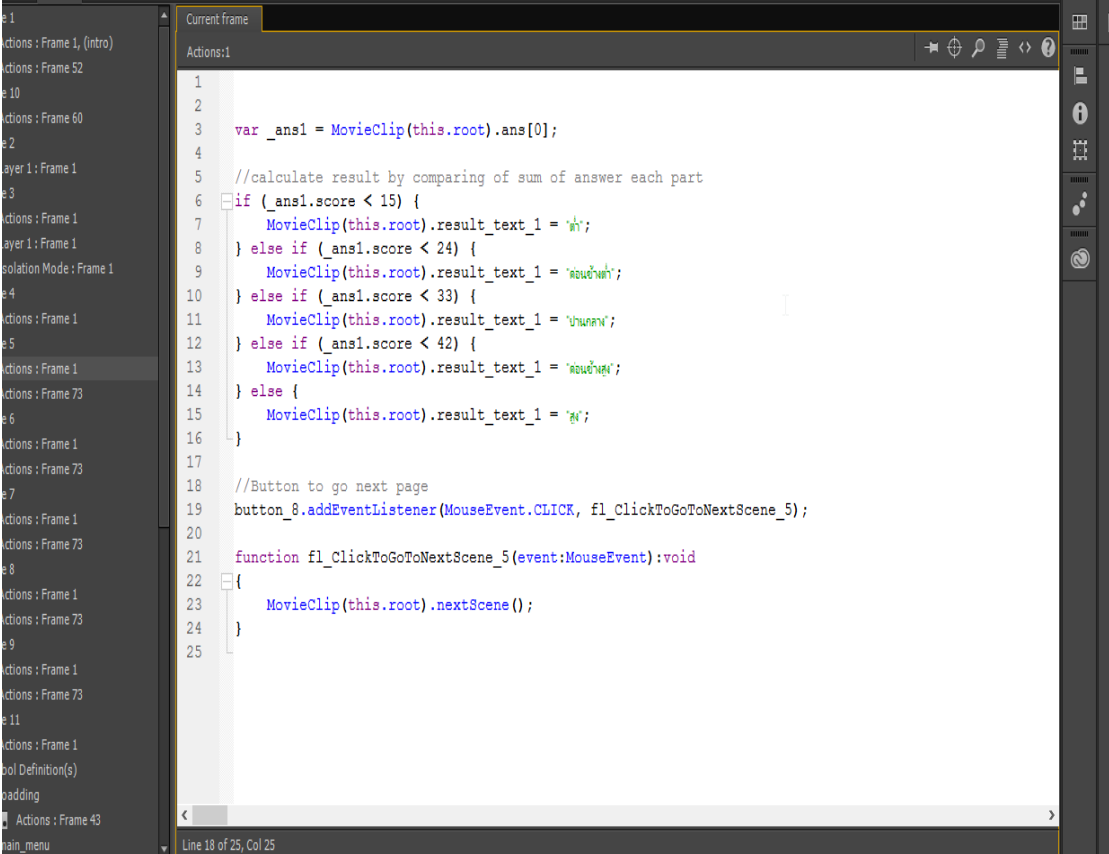


Figure 4.15 The commands of data calculations.

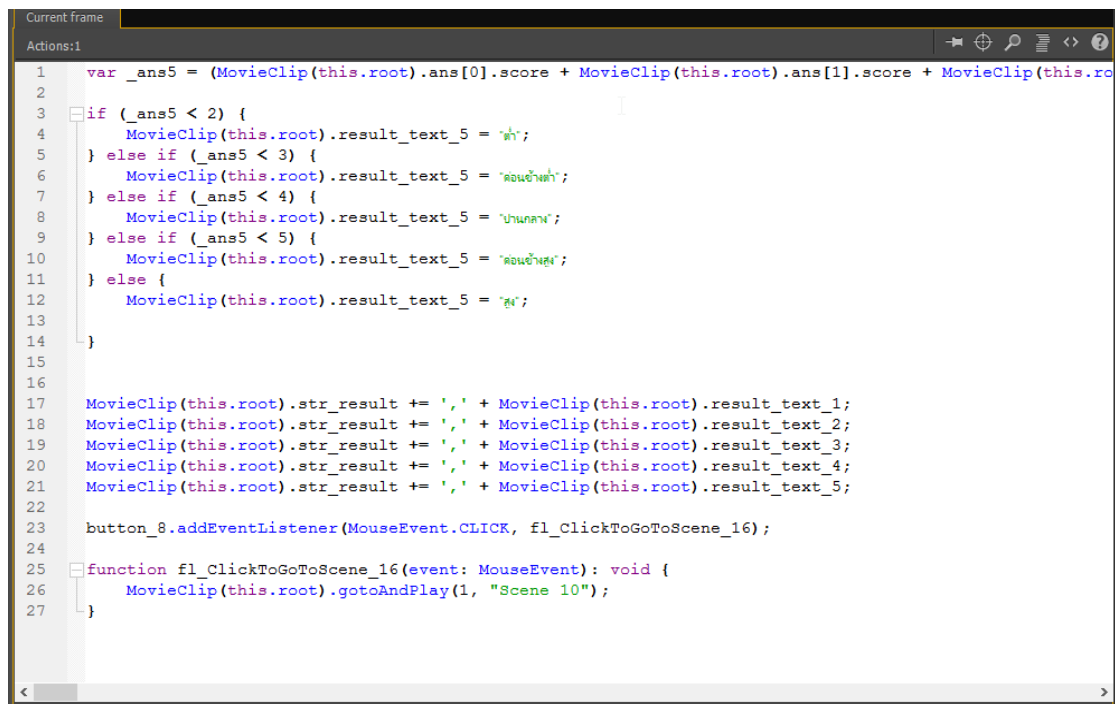
- The program calculates and displays the results of the test for the user.



```
1
2
3 var _ans1 = MovieClip(this.root).ans[0];
4
5 //calculate result by comparing of sum of answer each part
6 if (_ans1.score < 15) {
7     MovieClip(this.root).result_text_1 = "ต่ำ";
8 } else if (_ans1.score < 24) {
9     MovieClip(this.root).result_text_1 = "พอใช้ได้";
10 } else if (_ans1.score < 33) {
11     MovieClip(this.root).result_text_1 = "ปานกลาง";
12 } else if (_ans1.score < 42) {
13     MovieClip(this.root).result_text_1 = "พอดีมาก";
14 } else {
15     MovieClip(this.root).result_text_1 = "สูง";
16 }
17
18 //Button to go next page
19 button_8.addEventListener(MouseEvent.CLICK, fl_ClickToGoToNextScene_5);
20
21 function fl_ClickToGoToNextScene_5(event:MouseEvent):void
22 {
23     MovieClip(this.root).nextScene();
24 }
25
```

Figure 4.16 The commands of result calculations.

- In the part of “overall result”, the program will keep all of results and saved to a report file. When users do a test once, the result is considered one of the records. If the user do the exam again, the program will save the data indefinitely until the user clicks “Quit”.



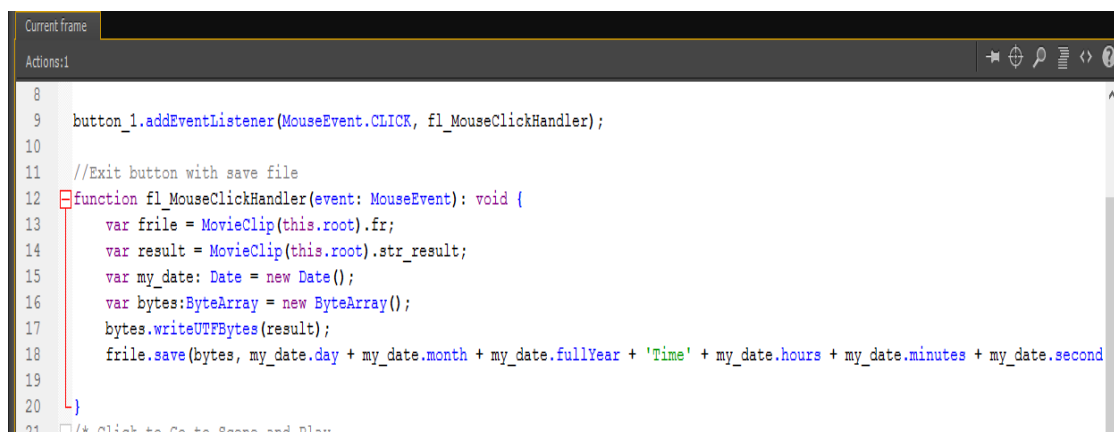
```

Current frame
Actions:1
1  var _ans5 = (MovieClip(this.root).ans[0].score + MovieClip(this.root).ans[1].score + MovieClip(this.ro
2
3  if (_ans5 < 2) {
4      MovieClip(this.root).result_text_5 = "ต่ำ";
5  } else if (_ans5 < 3) {
6      MovieClip(this.root).result_text_5 = "ค่อนข้างต่ำ";
7  } else if (_ans5 < 4) {
8      MovieClip(this.root).result_text_5 = "ปานกลาง";
9  } else if (_ans5 < 5) {
10     MovieClip(this.root).result_text_5 = "ค่อนข้างสูง";
11  } else {
12     MovieClip(this.root).result_text_5 = "สูง";
13  }
14  }
15
16
17  MovieClip(this.root).str_result += ',' + MovieClip(this.root).result_text_1;
18  MovieClip(this.root).str_result += ',' + MovieClip(this.root).result_text_2;
19  MovieClip(this.root).str_result += ',' + MovieClip(this.root).result_text_3;
20  MovieClip(this.root).str_result += ',' + MovieClip(this.root).result_text_4;
21  MovieClip(this.root).str_result += ',' + MovieClip(this.root).result_text_5;
22
23  button_8.addEventListener(MouseEvent.CLICK, fl_ClickToGoToScene_16);
24
25  function fl_ClickToGoToScene_16(event: MouseEvent): void {
26      MovieClip(this.root).gotoAndPlay(1, "Scene 10");
27  }

```

Figure 4.17 The commands of saving all data.

- When users click the button to quit the program, the program will ask them to store files. If the user chooses to save a file to the computer, the program will verify the authenticity of a file so that can be saved or not such the command below:



```

Current frame
Actions:1
8
9  button_1.addEventListener(MouseEvent.CLICK, fl_MouseClickHandler);
10
11  //Exit button with save file
12  function fl_MouseClickHandler(event: MouseEvent): void {
13      var frile = MovieClip(this.root).fr;
14      var result = MovieClip(this.root).str_result;
15      var my_date: Date = new Date();
16      var bytes:ByteArray = new ByteArray();
17      bytes.writeUTFBytes(result);
18      frile.save(bytes, my_date.day + my_date.month + my_date.fullYear + 'Time' + my_date.hours + my_date.minutes + my_date.second
19  }
20
21  /* Click to Go to Scene and Play

```

Figure 4.18 The commands of quit button.

- When the file is saved successfully, the program will close. On the other hand, if the file is not saved, the program will not close.

```

37 //listen for when then cancel out of the save dialog
38 fr.addListener(Event.CANCEL, onCancel);
39
40 //listen for any errors that occur while writing the file
41 fr.addListener(IOErrorEvent.IO_ERROR, onSaveError);
42
43 //called once the file has been saved
44 function onSave(e: Event): void {
45     trace("File Saved");
46     fscommand("quit");
47     fr = null;
48 }
49
50 //called if the user cancels out of the file save dialog
51 function onCancel(e: Event): void {
52     trace("File save select canceled.");
53     fr = null;
54 }
55
56 //called if an error occurs while saving the file
57 function onSaveError(e: IOErrorEvent): void {
58     trace("Error Saving File : " + e.text);

```

Figure 4.19 The commands of data recording in quit button.

How to use the software and recommended computer specification

This software has been developed to be compatible with multi-platform such as Windows, Mac OS and Linux. In order to run the software, Computers need to meet the minimum specification requirement for each platform which are;

Windows

- CPU: Intel 2.33 GHz or equivalent for Computer Desktop and Intel Atom 1.6 GHz or equivalent for Computer Notebook
- Operating System: Windows XP SP3, RAM: 512 MB, Graphic Card Memory: 128 MB

Mac OS

- CPU: Intel Core Duo 1.83 GHz or equivalent
- Operating System: Mac OS X Version 10.9, RAM: 512 MB, Graphic Card Memory: 128 MB

Linux

- CPU: Intel 2.33 GHz or equivalent for Computer Desktop and Intel Atom 1.6 GHz or equivalent for Computer Notebook

- Operating System: Red Hat Enterprise Linux (RHEL) 5.6, openSUSE 11.3 or Ubuntu 10.04, RAM: 512 MB

The software can be open from HDD, CD-ROM or USB Drive by double click on the icon:

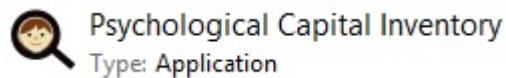


Figure 4.20 The psychological capital inventory icon

Part 2 The effectiveness of the Thai-psychological capital inventory computerized version includes:

2.1 Internal consistency reliability. The internal consistency reliability of the Thai-psychological capital inventory computerized version and the Thai-psychological capital inventory paper-pencil version was determined using Cronbach alpha to calculate the internal consistency reliability.

Table 2 shows the internal consistency reliability of the Thai-psychological capital inventory computerized version and the Thai-psychological capital inventory paper-pencil version.

Inventory	Coefficient of Reliability
Computerized version	.952
Paper-pencil version	.952

The table shows that Thai-psychological capital inventory computerized version and the Thai-psychological capital inventory paper-pencil version both have high coefficient of reliability (0.952).

2.2 Correlation. The correlation of the Thai-psychological capital inventory computerized version and the Thai-psychological capital inventory paper-pencil version (traditional version) were measured by using Pearson's Correlation Coefficient.

Table 4.1 shows the correlation coefficient between the Thai-psychological capital inventory computerized version and the Thai-psychological capital inventory paper-pencil version (n = 140).

	Pearson's Coefficient	Correlation
The correlation coefficient between the psychological capital inventory computerized version and the traditional version	.986**	

** Correlation was significant at the 0.01 level (2-tailed)

The analysis of correlation coefficient between the Thai-psychological capital inventory computerized version and the traditional version was significant at the 0.01 level, the assessment found that two versions are very highly correlated ($r = .986$).

2.3 The satisfaction in using the psychological capital inventory computerized version.

Table 4.2 shows the number and percentage of the sample by gender.

Gender	Number	Percentage
1. Male	52	37.1
2. Female	88	62.9
Total	140	100

Table 4.3 shows the results of users' satisfaction survey in using the Thai-psychological capital inventory computerized version in different **gender**.

Topic	Gender	Mean	S.D	Min	Max	P-Value
1 The illustrations are interesting.	Male	4.31	.729	3	5	.404
	Female	4.47	.660	3	5	
2 Pattern and font sizes are easy to read and attractive.	Male	4.37	.627	3	5	.533
	Female	4.56	.584	3	5	
3 The background colours are suitable.	Male	4.31	.701	3	5	.249
	Female	4.45	.605	3	5	
4 The overall design is beautiful and suitable.	Male	4.40	.721	2	5	.283
	Female	4.53	.606	3	5	
5 The design is easy to use. The menu is not complicated.	Male	4.60	.603	3	5	.955
	Female	4.58	.582	3	5	
6 The process system takes less time in using the program	Male	4.46	.670	2	5	.085
	Female	4.65	.568	3	5	
7 The speed of processing and providing feedback.	Male	4.54	.576	3	5	.164
	Female	4.66	.544	3	5	
8 Overall satisfaction with the program.	Male	4.35	.623	3	5	.374
	Female	4.58	.562	3	5	

The test results used an independent t-test (significance at 0.05 level) showed that the Thai-psychological capital inventory computerized version has no significance different.

Table 4.4 shows the analysis results, which includes Mean, Standard Deviation and Satisfaction levels of the sample in using the Thai-psychological capital inventory computerized version (n = 140).

Topic	Mean	S.D	Min	Max	Level of Satisfaction
1 The illustrations are interesting.	4.41	.688	3	5	Very satisfy
2 Pattern and font sizes are easy to read and attractive.	4.49	.606	3	5	Very satisfy
3 The background colours are suitable.	4.40	.644	3	5	Very satisfy
4 The overall design is beautiful and suitable.	4.49	.651	2	5	Very satisfy
5 The design is easy to use. The menu is not complicated.	4.59	.587	3	5	Very satisfy
6 The process system takes less time in using the program	4.58	.612	2	5	Very satisfy
7 The speed of processing and providing feedback.	4.61	.557	3	5	Very satisfy
8 Overall satisfaction with the program.	4.49	.594	3	5	Very satisfy

The table shows that the satisfaction in using the Thai-psychological capital inventory computerized version. The samples are very satisfied using this program ($\bar{x} = 4.49$), with an average satisfaction rating for each topic between 4.40 to 4.6161. This

shows that the samples are very satisfied with their experience using the Thai-psychological capital inventory computerized version in all aspects, especially the speed of processing and providing feedback. Also, samples indicated that the design is easy to use and the menu is not complicated.

CHAPTER V

DISCUSSION AND RECOMMENDATIONS

This research is intended to examine the effectiveness of the Thai-psychological capital inventory computerized version in terms of reliability and correlation compared with the Thai-psychological capital inventory paper-pencil version (traditional). This research also examines the satisfaction of participants. The research materials are divided into three parts. 1) the Thai-psychological capital inventory computerized version, 2) The Thai-psychological capital inventory developed by Sucheera Phattharayuttawat and 3) the satisfaction questionnaire in using The Thai-Psychological Capital Inventory computerized version. Data for this research was collected from a sample for 140 secondary school students between grade 4-6 at Pua school, Nan Province. The research methodology is summarized as follows:

Research Methodology

1. The researcher developed the Thai-psychological capital inventory computerized version:

- Collected data and contents of the Thai-psychological capital inventory then created the sequence of program presentation.

- Created a storyboard. This step is to design a presentation format including texts, images, background, character, animation, media and all of multimedia into paper in order to display on the screen.

- Developed a program based on storyboard that was created.

2. The researcher contacted and coordinated with the Director of Pua school, Nan province and asked permission to use the computer lab and collect data from students between grade 4-6.

3. Coordinated with the school director by bringing relevant documents and consent forms to make an agreement about the date and time for data collection.

4. The researcher installed Thai-psychological capital inventory program in the computer lap.

5. Cluster Random Sampling was used to randomly select students between grade 4-6 in Pua school, Nan for their voluntary participation. The researcher explained the purpose and process of data collection. Then the samples were divided into two groups.

6. Researchers first clarified purposes, benefits and protection of samples' privacy for participants research. After finished this procedure, the samples complete the personal information in approximately one minute, then started next procedure. Samples were divided into two equal groups. The first group completed the Thai-Psychological Capital Inventory computerised version, followed by the Thai-psychological capital inventory traditional version. The second group completed the Thai-psychological capital inventory traditional version followed by the Thai-Psychological Capital Inventory computerised version. This process took about 20-30 minutes.

7. After the samples finished the Thai-psychological capital inventory in two versions, they completed the satisfaction in using the Thai-psychological capital inventory computerized version.

8. The researcher collected the data from the samples and analyzed them using SPSS.

Discussion

This research aims develop a effective Thai-Psychological Capital Inventory computerized version and analyze its effectiveness compared to the Thai-psychological capital inventory paper-pencil version. The researchers developed the Thai-psychological capital inventory computerized version in terms of its reliability and correlation coefficient compared to the traditional version.

The study found that the reliability of the Thai-Psychological Capital Inventory computerized and the traditional version are both high ($\alpha = 0.952$), which is supports the hypothesis 1 that the computerized version of The Thai-Psychological Capital Inventory will be more effective as it provides high reliability and correlation compared with the traditional one. Considering that Fischer and Corcoran, who defined that the coefficient of reliability level to be between 0.71 to 1.00, which is consistent

with the concept of Williams indicated that the internal consistency reliability at the 0.80 level is quite positive (good). These results are accordance with previous research. Vallejo et.al analyzed the online version of psychopathology screening questionnaires by comparing reliabilities of the General Health Questionnaire-28 (GHQ-28) and the Symptoms Check-List-90-Revised (SCL-90-R). They found that the General Health Questionnaire-28 (GHQ-28) online version has reliability comparable to paper-pencil versions ($\alpha = 0.90$). The research also found that the Symptoms Check-List-90-Revised (SCL-90-R) online version has higher reliability than the paper-pencil version ($\alpha = 0.97$ and 0.96 , respectively). Similarly, Gualtieri and Johnson compared the reliability of CNS Vital Signs (CNSVS) computerized version, which is a well-known computerized neurocognitive test battery. They found that the reliability of each subtest to be between $0.60 - 0.85$. These can show that the CNSVS is suitable to be used as brief clinical evaluation instruments. Cho et. al developed the computerized Dementia Screening Test (CDST) in Korea and studied the reliability of CDST. They found that the overall reliability was statistically significant ($P = 0.89$), and it can be used as a screening material for people with dementia preliminary.

It also found that the correlation coefficient of the Thai-Psychological Capital Inventory computerized version and the traditional version has a high correlation ($r = 0.986$) was significant at the 0.01 level. These results show that the Thai-Psychological Capital Inventory computerized version is highly associated with the Thai-Psychological Capital Inventory the traditional version. If a user has results at the high level of psychological capital from the Thai-Psychological Capital Inventory computerized version, the user will have the same result from the traditional Thai-Psychological Capital Inventory as well. This suggest that the Thai-Psychological Capital Inventory computerized version can be used instead of the traditional Thai-Psychological Capital Inventory. There are several test results that suggest the coefficient is reliable between $.80 - .90$ (Crocker and Algina, 1986). The level or magnitude of the correlation use the number of the correlation coefficient. If the correlation coefficient is close to 1 or -1, it can indicate the correlation at the high level but if the value is close to 0, indicates a little or no correlation. In general, for determining the correlation coefficient one may use the criteria for the r value to show the level of correlation. Thus, r at 90 to 1.00 indicates a very high correlation, $.70 - .90$

indicates a high correlation, .50 - .70 indicating a very moderate correlation, .30 - .50 indicates a low correlation and .00 - .30 indicates a very low correlation. (Hinkle D. E. 1998, p.118) The correlation coefficient between the Patient-reported outcomes (PROs) paper-pencil version and the computerized version is not less than 0.75, which showed that the assessments are comparable. The Development of a Computerized Adaptive Test (CAT) for Schizotypy Assessment compared with the Oviedo Questionnaire for Schizotypy Assessment (ESQUIZO-Q) paper-pencil version suggests that the correlation coefficient between the total score of the test, CAT and paper-pencil version is . 0.92, so it can be used to evaluate patients.

The studied of satisfaction in using the Thai-psychological capital inventory computerized version found that the samples were highly satisfied in every aspect, especially in the speed of processing and speed of providing feedback. Additionally, users enjoyed the easy to use design and the uncomplicated menu. The average satisfaction with the program overall is at 4.49, which is accordance with the hypothesis 2 that people would be satisfied using The Thai-Psychological Capital Inventory computerised version.

It can be concluded that the Thai-psychological capital inventory computerized version has high efficiency in terms of reliability to evaluate the individual's psychological capital. Moreover, it has very high correlation coefficient in comparison with the traditional version and therefore can be use instead of the traditional one. The users had satisfaction in using the Thai-psychological capital inventory computerized version. Therefore, this version should be considered in the future when taking inventory of psychological assessment. However, it is important to note that the satisfaction evaluation of the Thai-psychological capital inventory computerized version is coming from a group that is interested and familiar with computer use.

Thus, operating this program with different group, the satisfaction in using this program might be different, it may be limited in terms of use because the user might be acquainted in using computers or has adequate skill in using computer to facilitate of use.

Conclusions

The Conclusions of this research are as follows:

The Thai-psychological capital inventory computerized version has high internal consistency reliability ($\alpha = 0.952$).

The Thai-psychological capital inventory computerized version is positively correlated with the Thai-psychological capital inventory paper-pencil version at .986. Shows that The Thai-psychological capital inventory computerized version can be used instead of the traditional one.

The samples are satisfied in using the Thai-psychological capital inventory computerized version in very high level.

The foregoing shows that The Thai-psychological capital inventory computerized version has effective internal consistency reliability in evaluating individual's psychological capital other than the traditional one and has also received satisfaction from users.

Recommendations

1. Further studies should be done on the effectiveness of this tool to other population groups.
2. Studies by considering other factors such as age, gender, education.
3. In case that the data of the Thai-psychological capital inventory paper-pencil version has been modified, it should have updated information on the Thai-psychological capital inventory computerized version, too. And should be updated the whole program in terms of bug fixes and data on the program

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APPENDICES

APPENDIX B

แบบสอบถามความพึงพอใจในการใช้แบบประเมินต้นทุนทางจิตวิทยาสำหรับคนไทย รูปแบบคอมพิวเตอร์

คำชี้แจง : กรุณาเลือกคำตอบตามความเป็นจริงหรือใกล้เคียงกับความเห็นของท่านมากที่สุด

ตอนที่ 1 ข้อมูลทั่วไปของผู้ตอบแบบสอบถาม

เพศ ชาย หญิง

ตอนที่ 2 ความพึงพอใจต่อด้านต่างๆ ในการใช้งานแบบประเมินต้นทุนทางจิตวิทยา รูปแบบคอมพิวเตอร์

รายการประเมิน	มากที่สุด	มาก	ปานกลาง	น้อย	น้อยที่สุด
1. ภาพประกอบทำให้เกิดความสนใจ					
2. รูปแบบและขนาดตัวอักษรอ่านง่าย ดึงดูดใจ					
3. การใช้สีพื้นหลังมีความเหมาะสม					
4. ความสวยงามในการออกแบบ โดยรวม					
5. ออกแบบใช้งานง่าย เมนูไม่ซับซ้อน					
6. กระบวนการทำงานของระบบมี ความรวดเร็วในการใช้บริการ					
7. ความรวดเร็วในการประมวลผลและ ให้ข้อมูลตอบกลับ					
8. ความพึงพอใจในภาพรวมในการใช้ งานโปรแกรม					

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