

# Developing Life Skills Scale for High School Students through Mixed Methods Research

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## Abstract

The construction of life skills scale is treated under mixed methods research which is exploratory design. First, qualitative analysis of affinity diagram technique was used to the 36 experts' brain storming and obtaining their consensus to group behaviour indicators based on life skills components and to generate scale items. Then all of each item is implemented to form the scale that can be used to collect data through quantitative method among 1,305 high school students around Thailand. In particular, confirmatory factor analyses comparing an empirical model and a factor structure proposed by experts is a better fit.

**Keywords:** Life Skills Scale, Mixed Method Research

## Introduction

Adolescence, the second decade of life (10-19 years), is a period of rapid development, when young people acquire new capacities and are faced with many new situations that create not only opportunities for progress, but also risk to health and wellbeing (World Health Organization, 1998). There is much research literature that indicates that life skills education is needed by young people and should therefore be developed. The literature points to deficits in life skills, and the need to teach life skills for abused children, for delinquent children, shy children, pregnant adolescents, for anger control, and for the prevention of anorexia and bulimia nervosa (Caplan et al, 1992; Global Health Council, 2003; Pederson, 1993). Indeed, there is a great wealth of research that identifies the need for life skills in many areas of young people lives (World Health Organization, 1996). Educating children and adolescents in the early years can instill positive health behaviours and prevent risk and premature death. Prevention can cost less than treatment. The life skills approach has several useful advantages. It can be applied in a range of cultural settings.. It lends itself to implementation in schools and other "formal" settings, but also to use in informal settings where skill development is the main goal ( Botvin & Kantor, 2001; Godfrey et al., 2002; Marlatt et al., 2003).

In South-East Asia, as life skills education has evolved during the past decade, health and education experts have put all possible efforts in exploring and identifying causal and sustainable solutions to prevent and to solve adolescent problems. The concept of life skills has been integrated during the drastic AIDS epidemic to prevent and resolve adolescent health behavioural problems (World Health Organization, 1998). The transmission of HIV has been largely caused from inappropriate sexual behaviour such as sexual promiscuous and having sex with commercial sex workers. In addition, young males are put at greater risk for HIV due to misinformation that is obtained by older and more sexually experienced individuals. Further, public health and education experts believed that, for a long-term solution rather than just focusing on resolving confrontation problems

between adolescents and adults it would be more effective to provide factual sexual attitude and life skills are educated and embedded to school children who will grow up and are exposed to the risk behaviours. Therefore, the focus of life skills education among students at the initial stage aimed to prevent and resolve AIDS problems (Suwanketnikom & Vorasan, 1996; Erawan, 1997; Erawan, 2007).

In Thailand, however, strategies for promoting life skills implemented by various agencies have changed over time to respond certain social problems. Between 1994 and 1998, the time during which a drastic epidemic of AIDS occurred, life skills were first introduced in prevention of AIDS. Later during 1999 – 2004, life skills were focused on prevention of drug use in schools and partly for prevention of mental health problems in some schools as well. This is because the problem of drugs and narcotics had been increasingly violent during the economic change, and at the same time, advanced technology had posed enormous mental problems to families and students. Life skills strategies had also been changed according to a number of educational reforms. Life skills had been introduced and included in the National Education Act B.E.2544 (2001), and in the Basic Education Curriculum B.E.2544 (2001), and various strategies for promoting life skills among students were employed. Development of cooperation between families and communities, for example, had emphasized on parents/community leaders involvement particularly in problem solving, while importantly, supporting a systematic school life skills management program that links to educational quality insurance. Development of Students Assistance System, 2000; Development of Well-being and Ethical Learning System, 2001; and Development of System for Learners Improvement Activities, 2002; all are projects under collaboration between the Ministry of Public Health and Ministry of Education (Erawan, 2002; Erawan, 2007; Department of Mental Health, 2002).

However, life skills education in Thailand context, although the concepts of elements of life skills, the process of creating life skills using participatory learning, and strategies for training to develop schoolwide teachers or strategies for systematic management within the schools that were developed by network received acceptance that they could cause good effects on work operation of these schools in creating students' life skills, the work operation in creating life skills in the past had not been clearly assessed (Erawan, 2007). As a matter of fact, there is not any objective and reliable scales for life skills, that's why this research aims at developing a life skills scale for high school students. The high school students are in the age of adolescence that is in need of developing life skills. The life skills scale is developed for high school students through mixed methods research as the life skills are variables with construct by WHO on 3 domains: knowledge, attitudes, and skills. (World Health Organization, 1993). Anyway it is not accurate to identify behaviour indicators based on 3 domains. Then it's the time to design the process of an instrument construction through qualitative method for theoretical framework of components, and variables and then quantitative method for generalization later (Creswell & Plano Clark, 2007; Johnson & Onwuegbuzie, 2004). The research is treated under qualitative method through affinity diagram for the experts' consensus on the behaviour indicators of students' life skills based on the domains of life skills. At last the behaviour indicators are constructed in the form of the life skills scale with its qualification through quantitative method.

## **Literature Review**

### **Conceptualizing the Component of Life Skills in Health Education**

For many decades, instruction about health and healthy behaviours was described as "health education." Within that broad term, health education took many forms. Health education has been defined as any combination of learning experiences designed to facilitate voluntary adaptations of behaviour conducive to health. Life skills development has always been included in health education. Psychosocial and interpersonal skills, such as communication, decision making and problem solving, coping and self-management and avoiding health-compromising behaviours are central. The attention to knowledge, attitudes, and skills together (with an emphasis on skills) is an important feature that

distinguishes skills-based education from other ways of educating about health issues (World Health Organization, 2003).

Life skills education differs in its objectives and contents from country to country and from one locality to another (World Health Organization, 1996). However, across cultures, life skills education is similar in three important ways. At the heart of life skills education is the learning of life skills. The World Health Organization defined life skills as “*are abilities for adaptive and positive behaviour that enable individuals to deal effectively with the demands and challenges of everyday life*” (World Health Organization, 1993). Life skills, from this perspective, are essentially those abilities which help to promote mental well-being and competence in young people as they face the realities of life. Secondly, to enable children to learn and practice skills, life skills education is based on a child-centred and activity oriented methodology. And finally, life skill education is based on the philosophy that young people should be empowered to take more responsibility for their actions (World Health Organization, 1993, 1996).

In particular, life skills are a group of psychosocial competencies and interpersonal skills that help people make informed decisions, communicate effectively, and develop coping and self-management skills to lead a healthy and productive life. Life skills may be directed toward personal actions or actions toward others, as well as to actions to change the surrounding environment to make it conducive to health (World Health Organization, 1993, 1997, 1998). Complementary life skills can be paired to reveal 5 main life skill areas: critical thinking-creative thinking, self-awareness - empathy, communication – interpersonal relationships, decision making –problem solving, and coping with emotions stressors. For health promotion, teaching skills in each of these areas provides a foundation in generic life skills for psychosocial competence (World Health Organization, 1997). Since 1994, the life skills concept has been applied in consistence with the Thai social context by adding another one pair of components, i.e. self-esteem and social responsibility. Life skills were then newly defined as an ability comprising knowledge, attitude, and skills in managing surrounding problems in the current social situation, and preparedness for self-adjustment in the future relating to sex, substances, gender role, family life, health, media influence, environment, ethics, and social problems, etc (Erawan, 1997: Erawan & Luang-ungkoon, 2001).

*Knowledge Domain comprises one pair of components: critical thinking-creative thinking:*

### **Critical Thinking**

Critical thinking is an ability to analyze and sort information, problems, and surrounding situations (World Health Organization, 1993). Hilgard (1962) noted that critical thinking is a basic ability for decision making to the situation or problems involving causes and effects. Hudgins (1977) viewed that the person with critical thinking must have adequate attitudes towards facts and evaluate arguments including attitudes towards knowledge on data classification as well as hypothesis scaling for reasonable conclusion. Beyer (1985) noted that critical thinking is an ability with specific characteristics as it needs a care to understand its definition definitely as well as analyses of data, knowledge, or belief objectively for judging validity and reliability of those data, knowledge, or belief. Critical thinking can contribute to health by helping us to recognize and assess the factors that influence attitudes and behaviour, such as values, peer pressure, and the media or gambling (World Health Organization, 1997). A previous research about life skills, mathematical reasoning and critical thinking in curriculum for the prevention of problem gambling, Nigel et al (2008) found significant improvement in the students’ knowledge of random events, knowledge of problem gambling awareness and self-monitoring, and knowledge of coping skills. The results suggest that knowledge based material on random events, problem gambling awareness and self-monitoring skills, and coping skills can be taught.

### **Creative Thinking**

World Health Organization (1993) defined creative thinking means an ability to think extensively and diversely without sticking to a particular concept. Creative thinking is a kind of divergent thinking that is ability of brain to think in different dimensions for new inventions including discovering problem solutions successfully through divergent thinking, composing of originality, fluency, flexibility, and elaboration. Divergent thinking is opposite to convergent thinking that is emphasis on only one idea but divergent thinking supports variety of ideas both quality and quantity as it is believed that divergent thinking can pave the way for good and qualified ideas (Guilford, 1959). Moreover, creative thinking is an ability of a person to have original notions which are different and their effects are not necessary to be perfect. Besides creative thinking originates through gathering knowledge from pre experience related to post experience, hence; the person with life skills must be able to think in variety aspects including originality, fluency, flexibility, and elaboration (Torrance, 1962). Creative thinking contributes to both decision making and problem solving by enabling us to explore the available alternatives and various consequences of our actions or non-action. It help us to look beyond our direct experience, and even if no problem is identified, or no decision is to be made, creative thinking can help us to respond adaptively and with flexibility to the situations of our daily lives (World Health Organization, 1997).

*Attitude domain comprises two pairs of components: self-awareness - empathy, and self-esteem - social responsibility:*

### **Self-Awareness**

Self-awareness refers to perception including understanding of feeling, idea, and emotion of the owner in reality and ability to control emotion as well as feeling. It is known as a conscious person who is able to perceive and realize one's own feeling, idea as well as emotion in reality and also to control one's own emotion and feeling (Goleman, 1996). Self-awareness includes our recognition of ourselves, of our character, of our strengths and weakness, desires and dislikes, and to differentiate oneself from another in terms of ability, sex, age, education, religion, complexion, locality, health, etc. Developing self-awareness can help us to recognize when we stressed or feel under pressure. It is also often a prerequisite for effective communication and interpersonal relations, as well as for developing empathy for others (World Health Organization, 1993; 1997; 2003).

### **Empathy**

World Health Organization (1993) defined empathy as an ability to understand others' feeling and to empathize with those who are different in terms of sex, age, education, religion, complexion, locality, health, etc. It is also to promote and improve each other from heart to heart as well as to show off the feelings properly, to realize and comprehend the feelings of the others, to perceive, estimate, and respond the needs of the others, to aid the others properly, and to provide the others opportunities (Goleman, 1996). Empathy is the ability to imagine what life is like for another person, even in a situation that we may not be familiar with. Empathy can help us to understand and accept others who may be very different from ourselves, which can improve social interaction, for example, in situations of ethnic or cultural diversity. Empathy can help us to encourage nurturing behaviour towards people in need of care and assistance, or tolerance, as is the case with AIDS sufferers, or people with mental disorders, who may be stigmatized and ostracized by the very people they depend upon for support (World Health Organization, 1997).

### **Self-Esteem**

Self-esteem is a major key to success in life. The development of a positive self-concept or healthy self-esteem is extremely important to the happiness and success of children and teenagers. Self-esteem is a feeling of value on oneself that can be discovered and proud of one's own potentialities without concerning to figure, face, charm, or sexual ability (Bass, 1960). Mussen and others (1990) viewed that the person who has feeling of his own value, ability, and self confidence must take them out for his

benefits. Department of Mental Health, Thailand (2002) defined self-esteem means recognizing one's own values such as being generous, giving and taking, exploring and being proud of one's own ability, e.g., in social ability, music, sports, arts, etc. without specific attention on appearance, appeal, sexual ability, or learning ability, etc.

### **Social Responsibility**

Social responsibility is a kind of conscious mind for success while working. The work is supposed to be successful and effective, anyhow the acceptance will be there on either good or bad work. Department of Mental Health, Thailand (2002) defined social responsibility means recognizing oneself as a part of the society and taking responsibility in social advances and degradation. Social responsibility is closely related to self-esteem. Self-esteem motivates the distribution to others and to the society.

*Skill domain comprises three components: interpersonal relationship and communication skills, decision making and problem solving skills, and coping with emotion and stress skills:*

### **Interpersonal Relationship and Communication**

Interpersonal relationship skill helps us to relate in positive ways with the people we interact with. This may mean being able to make and keep friendly relationship, which can be of great important to our mental and social well-being. It may mean keeping good relations with family members, which are an important source of social support. It may also mean being able to end relationships constructively (World Health Organization, 1993, 1997). Goleman (1996) pointed out that to create interpersonal relationship and communication is an active behaviour to communicate with other people for exchanging proper and valuable information into better change, through cooperative abilities with the others. Those abilities are: 1) able to convince the others to express their opinions out softly and effectively, 2) able to communicate well, accurately, softly, correctly and reliably, 3) able to be a leader with supporting colleagues and right way, 4) able to stimulate the condition for better change, 5) able to cope with conflicts effectively, to have verbal compromise, to improve and end the conflicts properly, 6) able to create the relationship as well as cooperation in work performance successfully, 7) able to work in teams with other people, and 8) able to create potentialities of the teams for cooperative power.

Effective communication means that we are able to express ourselves, both verbally and non-verbally, in ways that are appropriate to our cultures and situations. This means being able to express opinions and desires, but also needs and fears. And it may mean being able to ask for advice and help in a time of need (World Health Organization, 1997).

### **Decision Making and Problem Solving**

The problem solving is a kind of brain process that is complex, composing of visualizing, imagining, manipulating, analyzing, abstracting, and associating ideas (Johnson & Rising, 1969). World Health Organization (1993) defined that mean an ability to perceive problems and causes, seek choices, analyze advantage and disadvantage of each choice, assess choices, make sound decision of choice and solution, and implement suitable and correct solution. Grossinickle and Brueckner (1959) viewed that there are 8 components of problem solving process as follows: 1) the problem must concern with the children, 2) the problem must be able to solve, 3) the problem must be clear cut for each child to understand, 4) the way to solve problem proposed by the children is possible, 5) the children are suggested by the teachers to have planning on problem solution, data collection, data management, as well as evaluation, 6) implementing various ways for data collection, 7) the children can employ the former plans of problem solving process to the situation which is the source of problems, and 8) the problem solving is summarized. Decision making helps us to deal constructively with decisions about our lives. This can have consequences for health if young people actively make decisions about their

actions in relation to health by assessing the different options, and what effects different decisions may have need (World Health Organization, 1997).

### **Coping with Emotion and Stress**

World Health Organization (1993) defined coping with emotions mean an ability to assess emotion and being aware of its influence upon individual's behaviour, select suitable means to manage emotion, and an ability to recognize causes of tension and how to cope with it, how to release, avoid, and shift tension to other desirable behaviour. Stress is a result caused by the needs of changing various events affected to physical and mental health due to pressure. The pressure may be an event or any kinds of situation harmful on a person or just affects to mental site, level of anxiety the person perceives depending on different kinds of events. Those events cause the people under different levels of stress. There are two types of stress: 1) positive stress which is good to push the person to achieve a goal, and 2) negative stress which causes upset or depressed (Fishbein, 1975; Hartl, 1981). Coping with stress is about recognizing the sources of stress in our lives, recognizing how this affects us, and acting in ways that help to control our levels of stress. This may mean that we take action to reduce the sources of stress (World Health Organization, 1997).

### **The Measurement of Life Skills**

Since the promotion of life skills, as a matter of fact, there is not any objective and reliable instrument suit for life skills in term of WHO definitions. Regarding to Instrument used to evaluate results of life skills programs, various researchers have investigated outcome of programs and developed a variety of instrument to measure life skills in each component. In 1990, Botvin et al studied about students' life skills for preventing drug abuse through a multi-modal cognitive-behavioural approach. They measured attitudes about tobacco, alcohol and marijuana use by means of a 5-point Likert scale ranging from strongly agree to strongly disagree. Responses about normative beliefs were rated on a 6-point scale from *none* to *almost always*. A measure of decision making assessed the use of sound decision making skill, e.g. "When I have a problem I get information that is needed to deal with the problem". Seven items of this nature were used to assess decision making, five items were used to assess the use of different skills for coping with anxiety, with responses ranging from *never* to *almost always*. Both scales derived from the Coping Inventory developed by Wills (1986).

Measurement of coping with emotion and stress skills, Caplan et al (1992) studied about social competence promotion with inner-city and suburban young adolescents. They adapted scale from the Decision Making Questionnaire (Gerswick et al, 1988) to assess the quantity and effectiveness of solutions to a hypothetical vignette involving peer pressure to smoke of young adolescents. Degree of effectiveness for each items were coded using a 4-point scale ranging from 1 (*not very effective*) to 4 (*very effective*). For measurement of social and emotional adjustment, a teacher rating scale, developed by Allen et al (1989) provided an assessment of students' school behaviour. This measure requires classroom teachers to rate how well each of four items describes the student on a 5-point scale from 1 (*not at all*) to 5 (*very well*). The four items pertain to constructive conflict resolution with peers, impulse control, popularity and assertiveness with adults. A behavioural Conduct Scale and Self-Worth Scale were used to assess the children's perceptions of competence in these domains. The scale was taken from *The Self-Perception Profile for Children* (Harter, 1985). Students' general mood and emotional state was measured using the Rand Well-being Scale (Veit & Ware, 1983). This measure consists of 12 items that ask students to judge, on a 5-point Likert scale, how frequently they experience feelings such as loneliness, restlessness, and sadness.

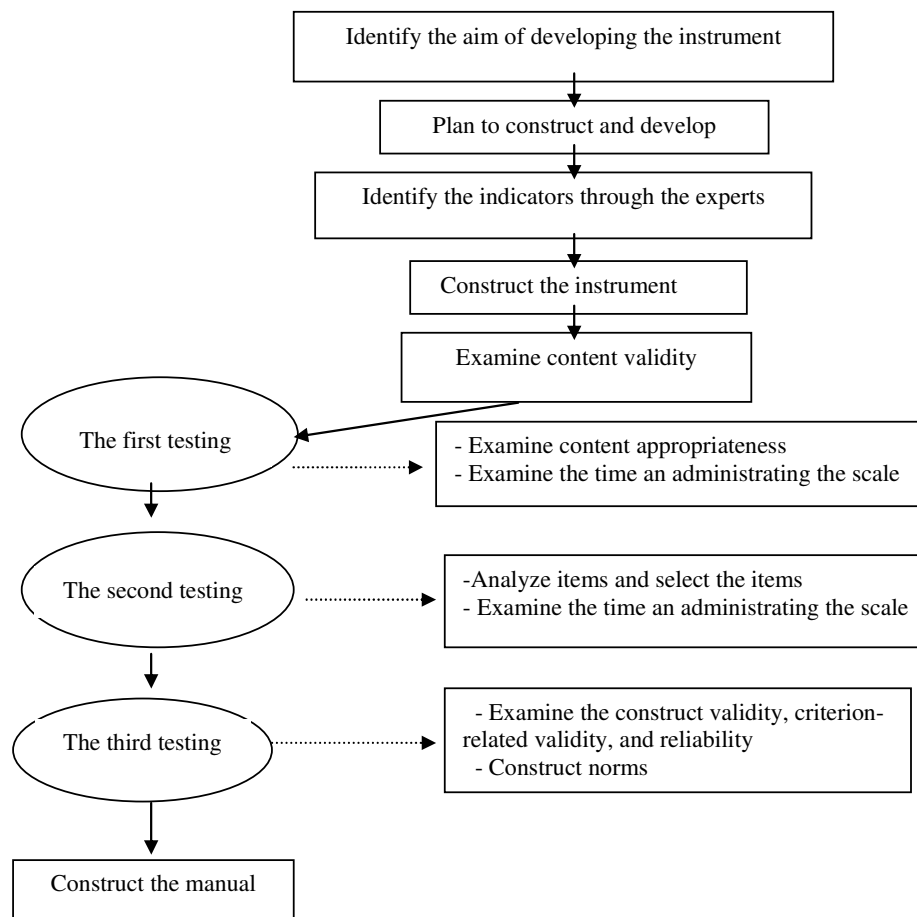
Regarding the measuring life skills construct, The Washington State University (WSU) designed a Web-based system (<http://ext.wsu.edu/lifeskills/>) to measure short-term gains in life skills taught in many extension youth and family programs in 2002. The system was developed and successfully scaled for validity and reliability for youth and adults ages sixth grade and older. The WSU Life Skills Evaluation System was designed by and for extension staff in the WSU. Extension staff selected eight life skills from the targeting life skills model (Hendricks, 1998) that they believed

they were teaching through their program. These life skills were: decision making, wise use of resources, communication, accepting differences, leadership, useful/ marketable skills, healthy lifestyle choices, and self-responsibility (Bailey & Deen, 2002). And then, Dunn & Arbuckle(2003) developed the life skills instrument consists of 36 questions, divided into two parts. The first part contains six questions related to demographics (age, gender, race, grade) and frequency of program participation. The second part contains 28 questions related to life skills and two questions that ask participants to directly rate the impacts of the program. The life skills questions fall into seven categories: academics and learning, communication, decision making, goal setting and goal achievement, problem solving, self esteem, and social competencies. There are four questions in each of these categories, which are presented in mixed order on the instrument. Responses are recorded on a five-point Likert scale. Depending on the wording of the question, the responses may range from “never” to “always” or from “strongly disagree” to “strongly agree”.

## Methods

The construction of life skills scale is treated under mixed methods research which is exploratory design (Creswell & Plano Clark, 2007). First, qualitative analysis of affinity diagram technique was used to the experts’ brain storming and obtaining their consensus to group behaviour indicators based on life skills components and to generate scale items. Then all of each item is implemented to form the scale that can be used to collect data through quantitative method as shown in the figure 1.

**Figure 1: Steps of Constructing and Qualifying the Scale**



### **Identifying Components and Behaviour Indicators through Affinity Diagram**

The construction of life skills scale aims at having a standardized instrument to investigate life skills of high school students to pave the way for developing and promoting life skills of Thai teenagers. The scale is constructed through 9 components of life skills as well as identifying behaviour indicators based on those components according to logical base with the experts' consensus.

The experts invited for panel are ones with field experience of developing life skills of students or any experiences concerned with promoting life skills of students from all over regions of Thailand. They are 9 psychologists, 9 education experts, 9 supervisors, and 9 teachers, totaling of 36. The brain storming through affinity diagram technique started by classifying the experts into 9 groups and each of which contains 4 persons based on 9 components of life skills. Each group contains a psychologist, an education expert, a supervisor as well as a teacher and continues to the following steps:

- 1) Each expert writes behaviour indicators of the students concerning their life skills through his own experience in a small piece of paper, each of which for one indicator unlimited in number that is up to his/her recall.
- 2) Each one sticks the paper on the board along with the reasons on each behaviour indicator in his/her paper. Later all of the others express the opinions towards the behaviour indicator on each paper either agreeably or disagreeably and the disagreeable paper is discarded.
- 3) All experts in the group rearrange the behaviour indicators under the consideration of their characteristics related to each other and each group of indicators is named at last.

### **Constructing and Qualifying the Scale**

After the behaviour indicators have been consented by the experts, the researcher implements them for items of the scale and proceeds it to the new experts of life skills as well as ones of measurement apart from the former ones, totaling of 7 for content validity. The items with consistency between behaviour indicators and the statements of .50 values up are accepted. 9 items out of 125 are revised and then the scale is under the process of trying out for its qualification 3 times as follows.

The first testing is to try out the scale on 10 students for investigating the appropriateness and accuracy of the contents as well as the language used in the scale. The time is identified for the scale administration including observing as well as interviewing the students and is in considered along with the results through the scale administration.

The second testing, the researcher revises the scale on the content as well as the language and the time is identified for the scale administration. Then the scale is used to try out for the second time on 60 students mixing among grade 7 to grade 12. The results are analyzed for correlation coefficient through item-total correlations and the items with the .01 level of statistical significance are accepted for the next testing.

The third testing is to treat the scale with qualified items on the sample, which is good representative, totaling of 1,305 and then the results are analyzed for its reliability, construct validity, criterion-related validity including the norms of the scale. The students from grade 7 to grade 12 are the sample through selective criterion a minimum of 20 cases for each variable (Hair, et al, 1998). The observable variables identified by the experts are 37, hence; the sample through multi-stage random sampling are from 51 high schools from all over Thailand classified into 571 males and 734 females, totaling of 1,305 for testing.

### **Statistical Analysis**

The researcher has treated on data analysis for statistic values as well as index values of the scale quality as follows: 1) analyze correlation coefficient of life skills scale through Item-total Correlation, 2) analyze internal consistency reliability of the scale through Cronbach's Alpha Coefficient, 3) investigate construct validity of the scale through third-order confirmatory factor analysis (third-order CFA) by LISREL 8.54, 4) investigate criterion-related validity through correlation coefficients



between scores from life skills scale and EQ scale under the Department of Mental Health, Thailand, and 5) compute normalized T-score for the norms of the life skills scale.

## Results

### The Result of Identifying Behaviour Indicators by the Experts

The result of identifying behaviour indicators through affinity diagram technique reveals that there are 125 behaviour indicators grouping into 37 variables based on 9 components of the life skills as follows: 1) Critical thinking with 10 indicators, 2) Creative thinking with 12 indicators, 3) Self-awareness with 13 indicators, 4) Empathy with 15 indicators, 5) Self-esteem with 14 indicators, 6) Social responsibility with 14 indicators, 7) Interpersonal relationship and communication skills with 17 indicators, 8) Decision making and problem solving skills with 17 indicators, and 9) Coping with emotion and stress skills with 13 indicators as shown in Table 1.

### The Result of Content Validity by the Experts and Trying Out the Life Skills Scale

The result of investigating consistency between behaviour indicators of life skills and the items of life skills scale constructed through the experts on psychology as well as educational measurement, totaling of 7 reveals that the value of correlative indexes of the scale is during 0.6-1.0. It indicates that the scale constructed is able to measure life skills covering of 9 components with 9 items revised on the language out of 125.

After the consensus of the experts, the scale is treated for the first testing on a small group of 10 students for investigating their understanding as well as the appropriateness of the language including the time for the scale administration. It is found that the scale contains 125 items. Under the first testing, it appears that there must be language revision for the students' understanding on 7 items and the students spends the time on the scale during 15-28 minutes. Then the scale is proceeded to the second testing on 60 students for correlation coefficient through item-total correlation. It appears that the scale consisting of 125 items on life skills for the second testing is shown with correlation coefficient from 0.17 to 0.68. There are 120 items with .01 level of statistical significance and there are 5 items with .05 level of statistical significance, hence: 120 items with higher correlation coefficient are accepted and the rest of 5 items are rejected.

After the analysis of correlation coefficient on the second testing along with the low qualitative items are rejected, the life skills scale is treated for the third testing on the sample of 1,305 students for correlation coefficient through item-total correlation. It reveals that the 120 items of life skills under the third testing maintain correlation coefficient during 0.20- 0.67 with .01 level of statistical significance.

**Table 1:** The list of behaviour indicators of life skills through affinity diagram sessions

Components	Variables	Indicators
1. Critical Thinking: The ability to analyze data of information, problems, and situations purposefully	Ability to analyze and indicate problems Classifying and selecting the data Constructing conclusion Identifying hypothesis Judging conclusion	-Able to discover causes of the problems -Able to tell one's own weaknesses -View the subjects in various dimensions -Not to believe in anything easily -Have one's own ideas -Have related thinking and reasonable thinking -Provide data of estimating situations -Have the work plan -Able to judge one's own deeds -Select what is beneficial to oneself
2. Creative thinking: The ability of divergent thinking	Originality	-Prefer learning new things -Prefer doing new things -Propose new ideas

	<p>Fluency</p> <p>Flexibility</p> <p>Elaboration</p>	<ul style="list-style-type: none"> <li>-Expand thoughts in various ways</li> <li>-Prefer thinking differently from the previous thoughts</li> <li>-Continue thinking from one's own thoughts</li> <li>-Prefer changing</li> <li>-Set up the questions over former plan</li> <li>-Prefer thinking by challenges</li> <li>-Analyze what has been done</li> <li>-Think carefully</li> <li>-Do things carefully</li> </ul>
<p>3. Self-awareness: Perception and comprehension of one's own feeling, idea, and emotion in reality and able to control one's own emotion and feeling</p>	<p>Ability to realize one's own emotion</p> <p>Self-management</p> <p>Self-assessment</p> <p>Perception of one's own ability as well as value</p>	<ul style="list-style-type: none"> <li>-Able to tell what is liked or disliked</li> <li>-Always realize one's own emotion</li> <li>-Able to tell one's own needs</li> <li>-Adjust emotion fast</li> <li>-Control emotion well</li> <li>-Express emotion properly</li> <li>-Tell the causes of one's own emotion</li> <li>-Tell one's own strengths</li> <li>-Tell one's own weaknesses</li> <li>-Realize one's own ability</li> <li>-Work in accordance with one's own ability</li> <li>-Assess one's own deeds</li> <li>-Accept the others' opinions</li> </ul>
<p>4. Empathy: Perception and comprehension of emotion, the others' needs, and care of the other's heart as one's own heart and show off properly</p>	<p>Understanding the others' feeling and thoughts</p> <p>Perception and responding the others' needs</p> <p>Promoting the others properly</p> <p>Providing the others Opportunities</p>	<ul style="list-style-type: none"> <li>-Accept the individual differences</li> <li>-Accept what the others do different from oneself</li> <li>-Able to observe the others' emotions</li> <li>-Care the others' needs</li> <li>-Realize the others' needs</li> <li>-Care the problems of colleagues</li> <li>-Feel bad with colleagues for their problems</li> <li>-Feel sympathy for the others with obstacles</li> <li>-Aid the others while having opportunity</li> <li>-Aid the others without any advantages</li> <li>-Please to see the success of the colleagues</li> <li>-Being supported for the Colleagues</li> <li>-Care the others' feelings</li> <li>-Prefer the others getting happy</li> <li>-Always provide opportunities to the others</li> </ul>
<p>5. Self-esteem: The good feeling towards oneself, feeling of one's own value, discovering and being proud of one's own abilities, and having self confidence and makes use of it for one's own benefits as well as the others'</p>	<p>Perceiving one's own value</p> <p>Self confidence of one's own ability or potentiality</p> <p>Open-minded for accepting any events</p> <p>Expressing behaviours properly</p>	<ul style="list-style-type: none"> <li>-Please one's own success</li> <li>-View the life as it's valuable</li> <li>-Satisfy what oneself has</li> <li>-Be confident on one's own deeds</li> <li>-Rely on oneself</li> <li>-Feel good on oneself</li> <li>-Realize one's own ability</li> <li>-Believe in one's own ability</li> <li>-Be intent not withdrawn</li> <li>-Develop oneself through the others' comments</li> <li>-Be responsible for one's own deeds</li> <li>-Dare to express opinions</li> <li>-Judge the others' opinions reasonably</li> <li>-Rely on oneself</li> </ul>
<p>6. Social responsibility: Realizing that oneself is a part of society and tries to do the best and successfully on duty and is responsible for the results</p>	<p>Following social laws</p> <p>Participating with the others creatively</p> <p>Following one's own duty</p>	<ul style="list-style-type: none"> <li>-Be self disciplined</li> <li>-Leave garbage at the right place</li> <li>-Not to break the laws</li> <li>-Follow the regulations</li> <li>-Offer oneself for public Perform the work for public</li> <li>-Not to be selfish</li> <li>-Be punctual</li> <li>-Perform the work on duty successfully</li> <li>-Be responsible for the work results</li> </ul>

	Keeping the public property	<ul style="list-style-type: none"> <li>-Not commit negative effects towards public</li> <li>-Not create harmful events to the others</li> <li>-Not destroy public property</li> <li>-Perceive that oneself must be responsible for public</li> </ul>
7. Interpersonal relationship and communication skills: Ability to communicate or have relationship with the others for good change or ability to seek for cooperation	<ul style="list-style-type: none"> <li>Ability to convince and motivate the others</li> <li>Ability to convey information well</li> <li>Ability to communicate with the others</li> <li>Ability to work with the others</li> <li>Ability to adjust in various situations</li> </ul>	<ul style="list-style-type: none"> <li>-It is agreeable after spoken</li> <li>-Always selected as a speaker</li> <li>-After spoken it's easy to understand</li> <li>-Listen and well get the concepts</li> <li>-Prefer contacting and making friends with others</li> <li>-Create relationships fast</li> <li>-Show off sincerely</li> <li>-Dare to speak with strangers</li> <li>-Work with the others well</li> <li>-Able to work in teams well</li> <li>-Be trusted by friends</li> <li>-Be beloved of friends</li> <li>-Be simple</li> <li>-Not over proud</li> <li>-Cope with conflicts well</li> <li>-Not over pessimistic</li> <li>-Able to deny the others</li> </ul>
8. Decision making and problem solving skills: Ability to perceive problems, causes, alternatives, and practice correctly as well as properly	<ul style="list-style-type: none"> <li>Perceiving and comprehending problems</li> <li>Making a decision</li> <li>Evaluation of making a decision</li> <li>To solve the problems flexibly and consciously</li> </ul>	<ul style="list-style-type: none"> <li>-Think carefully before conducting</li> <li>-View things in different dimensions</li> <li>-Discover causes and sources of the problems</li> <li>-Make a decision carefully</li> <li>-Able to estimate results</li> <li>-Not make a decision based on friends' influence</li> <li>-Solve problems before hands well</li> <li>-Risk reasonably</li> <li>-Prefer to have own decision more than to follow the orders</li> <li>-Stop performing in case of problems occurred</li> <li>-Discover causes of the problems</li> <li>-Accept the results occurred</li> <li>-Please to improve if the results out with problems</li> <li>-Plan for various alternatives</li> <li>-Believe that all problems have their ways out</li> <li>-Dare to consult the others before making a decision</li> <li>-Able to evaluate one's own potentiality</li> </ul>
9. Coping with emotion and stress skills: Ability to cope with emotions properly	<ul style="list-style-type: none"> <li>Ability to control and cope with one's own emotions while having the events before hand</li> <li>Ability to relax and reduce stress</li> <li>Ability to create activities or original viewpoints for benefits of life</li> </ul>	<ul style="list-style-type: none"> <li>-Cool and hard angry</li> <li>-Express dissatisfaction properly</li> <li>-Keep feeling well</li> <li>-Not over afraid of upset</li> <li>-Not worry about failure</li> <li>-Not fix with the past</li> <li>-Dare to face the sorrow</li> <li>-Have positive thinking on problems</li> <li>-Have stable emotion with hard varying</li> <li>-Prefer to do original activities</li> <li>-Be interested in any things surrounded</li> <li>-Be lively and have good emotions</li> <li>-Not sit in only one situation</li> </ul>

**Table 2:** The result of content validity and trying out the life skills scale

Components	Experts Judgment		Try out with small group	Try out with large group		Testing with sample	
	total Item	Improved items	Improved items	Item-total correlation	Rejected items	total Item	Item-total correlation
Critical Thinking	10	2	2	0.23 - 0.52	-	10	0.20-0.54
Creative Thinking	12	3	1	0.17 - 0.64	2	10	0.37-0.50
Self-awareness	13	1	-	0.18 - 0.55	1	12	0.38-0.52
Empathy	15	1	-	0.27 - 0.68	1	14	0.33-0.63
Self-esteem	14	-	1	0.40 - 0.60	-	14	0.41-0.67
social responsibility	14	-	1	0.31 - 0.57	-	14	0.33-0.59
Interpersonal relationship and communication skills	17	-	2	0.32 - 0.55	-	17	0.38-0.58
Decision making and problem solving skills	17	2	-	0.32 - 0.55	-	17	0.45-0.65
Coping with emotion and stress skills	13	-	-	0.20 - 0.52	1	12	0.49-0.50
<b>Total</b>	<b>125</b>	<b>9</b>	<b>7</b>	<b>0.17 -0.68</b>	<b>5</b>	<b>120</b>	<b>0.20-0.67</b>

### The Qualification of the Life Skills Scale

#### Descriptive Statistics

After the third testing of life skills scale, its basic statistical value is analyzed as shown in the Table 3. It appears that the third testing contains 291.83 as the mean out of 360 scores and the standard deviation is 22.82.

**Table 3:** Descriptive statisticse of the life skills scale

Components	Items number	Total score	Mean	Standard Deviation
Critical Thinking	10	30	23.07	2.65
Creative Thinking	10	30	18.11	2.39
Self-awareness	12	36	27.18	2.89
Empathy	14	42	35.69	3.37
Self-esteem	14	42	32.41	3.48
Social responsibility	14	42	36.49	3.87
Interpersonal relationship and communication skills	17	51	37.46	4.50
Decision making and problem solving skills	17	51	38.69	4.29
Coping with emotion and stress skills	12	36	24.44	4.00
<b>Total</b>	<b>120</b>	<b>360</b>	<b>291.83</b>	<b>22.82</b>

### The Reliability of the Life Skills Scale

The reliability of the life skills scale is classified into each aspect as well as all aspects through alpha coefficient which is 0.92. When each aspect is considered, the reliability shows from 0.67 to 0.78. The social responsibility shows the highest reliability and the critical thinking shows the lowest reliability. The value of reliability of both each aspect and all aspects is .01 level of statistical significance but the standard error of each aspect is valued from  $\pm 1.35$  to  $\pm 2.43$  and the whole is valued  $\pm 6.45$ .

**Table 4:** The reliability of the life skills scale

Components	Alpha coefficients ( $\alpha$ )	(SEmeas)
Critical Thinking	0.67**	± 1.52
Creative Thinking	0.68**	± 1.35
Self-awareness	0.76**	± 1.71
Empathy	0.76**	± 1.99
Self-esteem	0.70**	± 1.97
Social responsibility	0.78**	± 1.97
Interpersonal relationship and communication skills	0.71**	± 2.42
Decision making and problem solving skills	0.72**	± 2.43
Coping with emotion and stress skills	0.71**	± 2.15
<b>Total</b>	<b>0.92**</b>	<b>± 6.45</b>

### The Construct Validity of the Life Skills Scale

The result of third-order confirmatory factor analysis of model is to investigate construct validity. The Table 5 shows that the indexes value of correlation between model and empirical data obtains chi-square 3.78 ( $P = 0.92514$ ) at the degrees of freedom 9 with no statistical significance and Goodness of Fit Index (GFI) is 1.00, Adjust Goodness of Fit Index (AGFI) is 1.00, RMR is .006. It shows that the model of correlative construct based on life skills framework identified fit empirical data from the scale constructed.

**Table 5:** The construct validity of the life skills scale

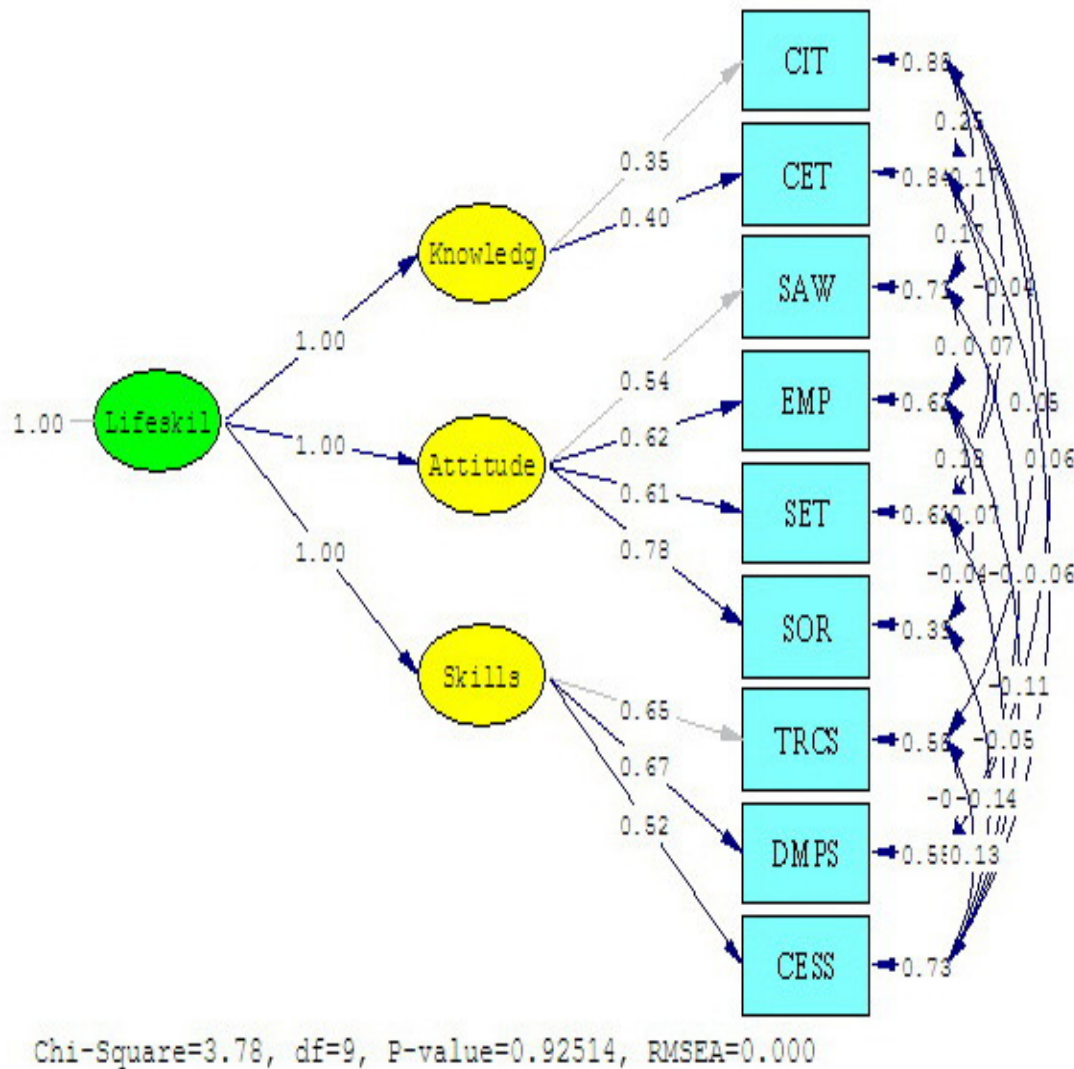
Factors	Factor Loading b(SE)	T	R <sup>2</sup>	FS
First order CFA				
Knowledge				
Critical Thinking	.35**	-	.12	.01
Creative Thinking	.40**(.04)	10.33	.16	.02
Attitude				
Self-awareness	.54**	-	.29	.13
Empathy	.62**(.04)	14.15	.38	.08
Self-esteem	.61**(.05)	13.41	.38	.16
Social responsibility	.78**(.05)	14.96	.61	.36
Skills				
Interpersonal relationship and communication skills	.65**	-	.42	.15
Decision making and problem solving skills	.67**(.04)	18.17	.45	.22
Coping with emotion and stress Skills	.52**(.04)	13.50	.27	.17
Second order CFA				
Knowledge	1.00**(.09)	11.21	1.00	-
Attitude	1.00**(.05)	18.27	1.00	-
Skills	1.00**(.05)	21.55	1.00	-

Chi – Square = 3.78 df = 9 P – value = .92514

GFI = 1.00 AGFI = 1.00 RMR = .006 RMSEA = .000

\*\* P < .01

**Figure 2:** Third-order confirmatory factor analysis of life skills model



**The criterion-related Validity of the Life Skills Scale**

The EQ scale under the Department of Mental Health for the adolescents between 12-17 years that has been administered on a group of 50 samples for criterion-related validity of the life skills scale constructed through the Pearson product-moment correlation is .72 with .01 level of statistical significance.

**The Norms of the Life Skills Scale**

The result of the third testing is able to construct norms in the form of normalized T-score as shown in the Table. The life skills are identified into 3 levels including low, normal, and high. The norms are constructed through Normalized T-score as follows: 1) The life skills with low level are shown by Normalized T-score under 40 with raw scores under 269, 2) The life skills with normal level are shown by normalized T-score during 40-60 with raw scores during 269-314 and 3) The life skills with high level are shown by Normalized T-score higher than 60 with raw scores in or over 314 out of 366 as a total.

**Table 6:** The norms of the life skills scale

Factors	Lower Norms		Norms		Upper Norms	
	Raw score	T score	Raw score	T score	Raw score	T score
Critical Thinking	< 21	< 41	21 – 25	41 – 59	> 25	> 59
Creative Thinking	< 16	< 41	16 – 20	41 – 59	> 20	> 59
Self-awareness	< 25	< 41	25 – 30	41 – 59	> 30	> 59
Empathy	< 33	< 41	33 – 39	41 – 59	> 39	> 59
Self-esteem	< 30	< 42	30 – 35	42 – 58	> 35	> 58
Social responsibility	< 34	< 42	34 – 39	42 – 58	> 39	> 58
Interpersonal relationship and communication skills	< 34	< 42	34 – 41	42 – 58	> 41	> 58
Decision making and problem solving skills	< 35	< 41	35 – 42	41 – 59	> 42	> 59
Coping with emotion and stress skills	< 22	< 42	22 – 28	42 – 58	> 28	> 58
<b>Total Score</b>	<b>&lt; 269</b>	<b>&lt; 40</b>	<b>269-314</b>	<b>40 - 60</b>	<b>&gt; 314</b>	<b>&gt; 60</b>

## Discussion

The process of constructing the life skills scale is based on logical base and empirical base. It is viewed that identifying the behaviour indicators in accordance with the components based on logical base under the skill framework of World Health Organization (1993) is determined to 7 components of life skills. In case of Thailand condition, the Department of Mental Health has added up 2 more components including self esteem and social responsibility which have been expanded and accepted in general since 1994. However, those have not been under any researches or identification of behaviour indicators of the students on life skills accurately. Creswell and Plano Clark (2007) proposed that constructing an instrument for measuring trait or variables are inaccurate in term of theory, the research should have been mixed method research through qualitative method for the accuracy in term of theory by studying empirical data and developing to theoretical framework for data collection through quantitative method.

Mixed methods research is formally defined here as the class of research where the researcher mixes or combines qualitative and quantitative techniques, methods, approaches, concept or language into the single study (Johnson & Onwuegbuzie, 2004). Mixed methods research also is an attempt to legitimate the use of multiple approaches in answering research questions, rather than restricting or constraining researchers' choices. It is an expansive and creative form of research, not a limiting form of research. Mixed methods have the potential to reduce some of the problems associated with singular methods. By utilizing quantitative and qualitative techniques within the same framework, mixed method research can incorporate the strengths of both methodologies (Sechrest & Sinada, 1995). A problem exists when qualitative research can provide an adequate exploration of problem, but such an exploration is not enough-quantitative research is needed to further understanding the problem. The situations in which this occurs are when qualitative research can explore initially to best identify variables, constructs, taxonomies, and theories to scale, as well as aid in the identification of items and scales to help develop a quantitative instrument. Mixed method research provides a good method for these types of problems (Creswell & Plano Clark, 2007).

This research is treated through qualitative method that is affinity diagram technique to identify behaviour indicators and obtain consensus from 36 experts, each of which has experiences on life skills promoting to youngsters and is a key person on life skills in a network of the Department of Mental Health. To identify correlative construct of the components and behaviour indicators of life skills for this research is theoretical reliability. In relation to empirical base, this research employs confirmatory factor analysis through LISREL program to examine construct validity between the models created through theories if incorporated with empirical data or not. In fact, CFA is congruent with the research with theories, moreover; the construct analysis through LISREL program is released the statistical fundamental agreement that agrees with deviation correlated for correct analysis of the result. The

research findings reveal that the Goodness of Fit Index is 1.00 and the Adjusted Goodness of Fit Index is 1.00. By chi-square testing, there is not statistical significance which reveals the construct model based on theories in accordance with empirical data from the scale constructed. That is the life skills scale for high school students obtains construct validity (Bollen, 1989; Joreskog & Sorbom, 1993).

Besides the qualification of the life skills scale on correlative validity is treated by employing the EQ scale for adolescents from 12 to 17 years under the Department of Mental Health on 50 samples. The scores are computed for correlation between those from life skills scale and those from EQ scale which is .72 at .01 level of statistical significance. It shows that the life skills scale for high school students obtains criterion-related validity. In relation to the reliability of the life skills scale, the research employs the analysis of reliability through Alpha Coefficient which is congruent with rating scale instrument. The analysis shows that the life skills scale obtains reliability of .92 approaching to 1, it means high reliability.

## Conclusion

The life skills scale through this research is developed based on principles of theory as well as empirical data investigation. The construction of norm criterion of the scale created from the students all over the country as a sample. The schools including the personnel related are able to apply it to explore life skills condition of the high school students in every region or the adolescents aging from 12 to 17 years. However, the use of the scale should be under consideration of norm the researcher developed through the calculation of T-scores for comparison of raw scores on each aspect and all aspects. The level of life skills is identified into 3 classes including low, normal, and high and the classification of T-scores is done through T-scores divided by the life skills level and then compared to T-scores 50 of each aspect. To classify the life skills to 3 levels is easy for employing the scale to identify the levels of life skills of the students in accordance with the framework of constructing EQ scale (Department of Mental Health, 2002).

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