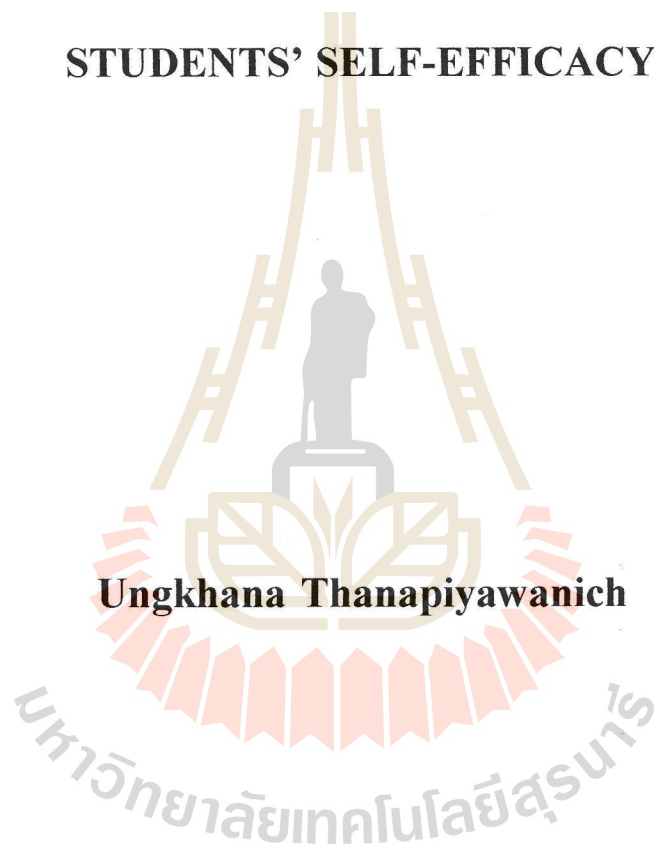


**GUIDELINES OF GROWTH MINDSET AND
SELF-FULFILLING PROPHECY DEVELOPMENT
TO ENHANCE COOPERATIVE EDUCATION
STUDENTS' SELF-EFFICACY**



**A Thesis Submitted in Partial Fulfillment of the Requirements for the
Degree of Doctor of Management in Cooperative Education
Suranaree University of Technology
Academic Year 2019**

แนวทางการพัฒนารอบความคิดแบบเติบโตและการคาดการณ์ของตนเอง
ที่ส่งผลให้เกิดขึ้นจริง เพื่อส่งเสริมการรับรู้ความสามารถของตนเอง
ของนักศึกษาสหกิจศึกษา



วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาการจัดการดุขฎิบั้ฉฑิต
สาขาวิชาสหกิจศึกษา
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ปีการศึกษา 2562

**GUIDELINES OF GROWTH MINDSET AND SELF-FULFILLING
PROPHECY DEVELOPMENT TO ENHANCE COOPERATIVE
EDUCATION STUDENTS' SELF-EFFICACY**


Suranaree University of Technology has approved this thesis submitted in partial fulfillment of the requirements for the Degree of Doctor of Management.

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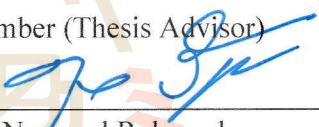
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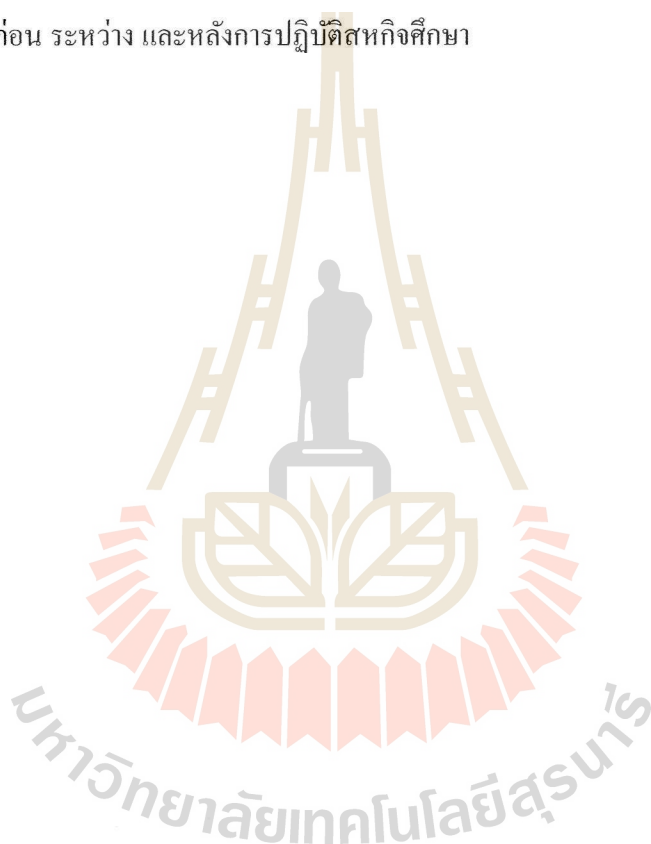
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การวิจัยครั้งนี้มีวัตถุประสงค์ ดังต่อไปนี้ (1) เพื่อออกแบบและพัฒนากระบวนการพัฒนา
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มีกลุ่มทดลองเป็นนักศึกษาสหกิจศึกษาจำนวน 36 คน และกลุ่มควบคุมเป็นนักศึกษาสหกิจศึกษา
จำนวน 36 คน การออกแบบและพัฒนากระบวนการใช้ ADDIE Model เครื่องมือวิจัยที่ใช้ในการ
รวบรวมข้อมูลเชิงปริมาณคือ แบบทดสอบความรู้ก่อนเรียนและหลังเรียน แบบวัดเชิงปฏิบัติ
แบบสอบถามเพื่อวัดการรับรู้ความสามารถของตนเองของนักศึกษาสหกิจศึกษาทั้งก่อนและหลัง
การปฏิบัติสหกิจศึกษา และเครื่องมือวิจัยที่ใช้ในการรวบรวมข้อมูลเชิงคุณภาพคือ การบันทึก
สะท้อนการเรียนรู้ การสนทนากลุ่มย่อยออนไลน์ และการสัมภาษณ์ส่วนบุคคล โดยจัดการข้อมูล
ด้วยโปรแกรม NVIVO โดยใช้สถิติในการวิเคราะห์คือ ค่าเฉลี่ย การทดสอบความแตกต่างของ
ค่าเฉลี่ย การทดสอบความแตกต่างระหว่างกลุ่ม และการวิเคราะห์ถดถอยพหุคูณเพื่อหา
ความสัมพันธ์ระหว่างตัวแปรต้นและตัวแปรตาม รวมถึงการวิเคราะห์เนื้อหาของข้อมูลเชิงคุณภาพ
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กระบวนการที่พัฒนาขึ้น ประกอบด้วย (1) การอบรมเรื่องกรอบความคิดแบบเติบโตและ
การคาดการณ์ของตนเองที่ส่งผลให้เกิดขึ้นจริง (2) การบันทึกสะท้อนการเรียนรู้ออนไลน์ (3) การ
ประชุมกลุ่มย่อยออนไลน์ และ (4) การสัมภาษณ์รายบุคคล นอกจากนี้ ยังพบว่า ผลการรับรู้
ความสามารถของตนเองของนักศึกษาสหกิจศึกษาในกลุ่มทดลองมีความแตกต่างอย่างมีนัยสำคัญที่
ระดับ $p < .001$ แสดงให้เห็นว่ากระบวนการมีผลต่อการรับรู้ความสามารถของตนเองของนักศึกษา
สหกิจศึกษา โดยมีตัวแปรต้น 4 ตัว (ความสำเร็จ ผลสัมฤทธิ์ที่ปรารถนา การตระหนักรู้ในการ
หลีกเลี่ยงพฤติกรรมเชิงลบ และความเพียรพยายามเพื่อก้าวข้ามอุปสรรค) ที่มีความสัมพันธ์และ
ทำนายผลต่อตัวแปรตาม (เป้าหมาย ความพยายามและความเพียรพยายาม การเรียนรู้และ
ความสำเร็จ และการเลือกทำกิจกรรม) นักศึกษาสหกิจศึกษากลุ่มทดลองยังเห็นว่ากระบวนการนี้

เป็นประโยชน์ และส่งเสริมผลสัมฤทธิ์ในการปฏิบัติสหกิจศึกษา

จากผลวิจัยทั้งปริมาณและคุณภาพยืนยันว่า กระบวนการพัฒนากรอบความคิดแบบเติบโต และการคาดการณ์ของตนเองที่ส่งผลให้เกิดขึ้นจริงมีผลต่อการรับรู้ความสามารถของตนเองของ นักศึกษาสหกิจศึกษา ผู้วิจัยจึงเสนอให้นำกระบวนการนี้ไปใช้กับนักศึกษาที่ไปปฏิบัติสหกิจศึกษา โดยให้ความสำคัญกับ (1) การประยุกต์ใช้ทุกขั้นตอนของกระบวนการร่วมกัน (2) การใช้ แพลตฟอร์มแลกเปลี่ยนเรียนรู้ดิจิทัลและเครื่องมือออนไลน์ (3) การมีส่วนร่วมของ โค้ช ผู้นิเทศงาน ในสถานประกอบการ และอาจารย์นิเทศ และ (4) การส่งเสริมการสะท้อนคิดของนักศึกษาตลอด กระบวนการทั้งก่อน ระหว่าง และหลังการปฏิบัติสหกิจศึกษา



สาขาวิชาสหกิจศึกษา

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UNGKHANA THANAPIYAWANICH : GUIDELINES OF GROWTH
MINDSET AND SELF-FULFILLING PROPHECY DEVELOPMENT TO
ENHANCE COOPERATIVE EDUCATION STUDENTS' SELF-EFFICACY.
THESIS ADVISOR : ASSOC. PROF. WEERAPONG POLNIGONGIT,
Ph.D., 240 PP.

GROWTH MINDSET / SELF-FULFILLING PROPHECY / SELF-EFFICACY /
COOPERATIVE EDUCATION

The purposes of this study are (1) to design and develop growth mindset and self-fulfilling prophecy intervention to enhance Co-op students' self-efficacy and (2) to investigate the effects of growth mindset and self-fulfilling prophecy intervention on Co-op students' self-efficacy. This study used the mixed method with quasi-experimental research design with a control group of 36 Co-op students and an experimental group of 36 Co-op students. The design and development of intervention was based on the instructional design ADDIE. The research tools used to collect the quantitative data were the pre-test and post-test of the measurable learning outcome test, the observable learning outcome test, and self-efficacy questionnaires. While the qualitative data was collected from the online reflective journal, the online group discussion and the individual interview using NVIVO program as data organizing. Then, the mean and standard deviation and the paired-sample *t*-test were used to do a comparative analysis. Also, the stepwise linear regression analysis was conducted to see the correlations of the independent and dependent variables. The ANOVA analysis was conducted to compare the difference between groups. And, the qualitative data was analyzed by using thematic content analysis. This study was conducted during December 2018 – April 2019.

The designed intervention consisted of (1) growth mindset and self-fulfilling prophecy work session, (2) online reflective journal, (3) online group discussion, and (4) individual interview session. This study found that Co-op students' self-efficacy of the experimental group revealed a statistical difference at $p < .001$ level, indicating the effect of intervention on self-efficacy. In addition, there were a total of four independent variables (Achievement, Desired outcome, Awareness to avoid negative action, and Persist in the face of setbacks) of growth mindset and self-fulfilling prophecy that could predict the dependent variables (Goals, Effort and persistence, Learning and achievement, and Activity selection) of self-efficacy. Furthermore, Co-op students expressed positive attitudes toward the intervention and learning outcomes from Cooperative Education.

Evidently, both quantitative and qualitative findings confirmed that the intervention positively enhanced the Co-op students' self-efficacy. It is recommended to implement intervention for all Co-op students focusing on (1) employing integrated intervention process, (2) utilizing the digital sharing platform and online tool, (3) engaging of coach, mentor, and professor, and (4) encouraging reflection throughout the intervention during Cooperative Education.

School of Cooperative Education

Academic Year 2019

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Ungkhana Thanapiyawanich

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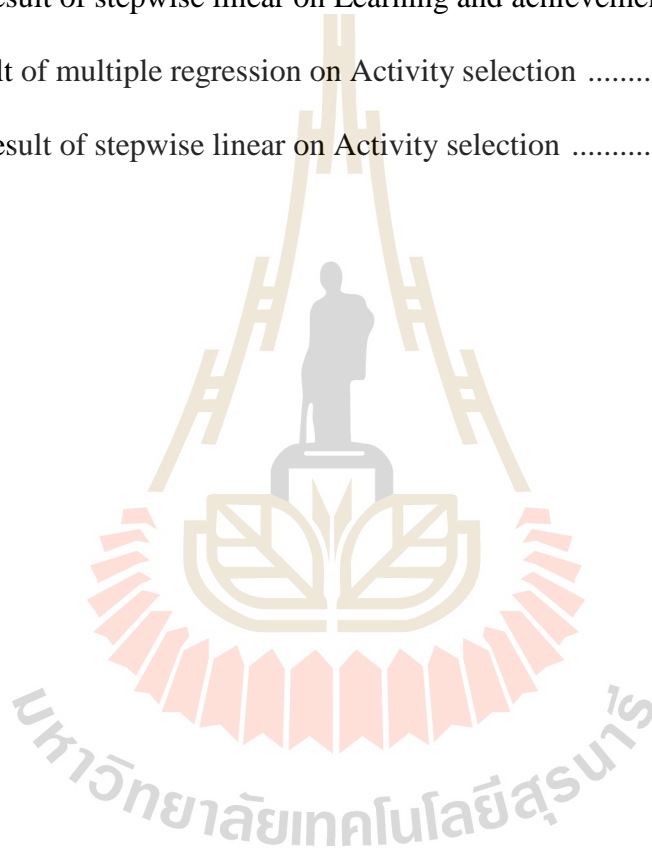
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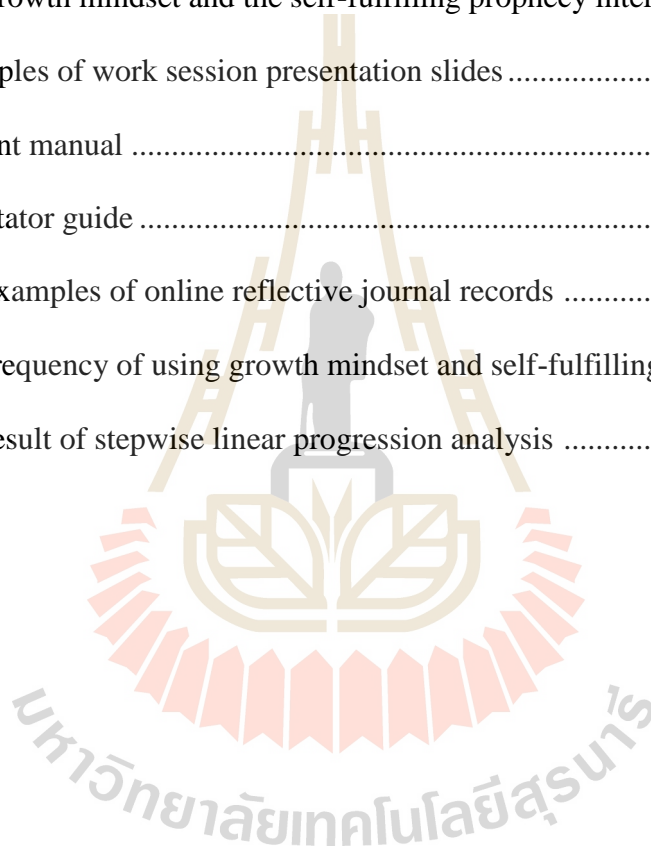


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CHAPTER 1

INTRODUCTION

1.1 Introduction

The 21st century is a disruptive era and technology plays an obvious role in the world. The Partnership for 21st Century Learning (P21) has developed the P21 framework with the input from stakeholders including teachers, educators, educational experts, and leaders from business sector. The framework has been defined and it illustrated the skills, knowledge, and support systems which enhance students so they can be successful in work, life, and citizenship (Partnership for 21st Century Learning, 2016).

Second to the Partnership for 21st Century Learning, UNESCO reported “The Treasure Within” and the four pillars “Learning to do, Learning to be, Learning to understand, and Learning to live together” which focus the educational activities on ‘Lifelong Learning for All’. Lifelong learning becomes the guiding principle for provision and learners’ participation across the continuum of learning, not just education and training. (Longworth, 2003: 9). It is continuous throughout life and is focused entirely on the needs and demands of the learners themselves (Miller, 2001: 12).

The Thailand Office of the Higher Education Commission (OHEC) found the necessity to improve the higher education curriculum to meet the demands of industry and increase employability (Yurarach, 2013: 144) as stated in the Twelfth National Economic and Social Development Plan (2017-2021) by the Office of the National Economic and Social Development Council. Cooperative Education (Co-op) is

mentioned as a mechanism for developing educational quality, technology responses, employability, and lifelong learning.

“The improvement in educational quality also requires excellence in the specialized fields, such as through Dual Vocational Education and Cooperative Education, in order to prepare the workforce to have the requisite skills before entering the labor market. Furthermore, there is a need to create an environment for lifelong learning which features diverse learning materials and centers.”

“Moreover, one major development focus is on building up an environment conducive to knowledge-focused and innovation-driven production by establishing an efficient platform for cooperation linkages between the academic and industrial sectors in order to develop high quality human resources for industry, and support R&D for advanced industrial technology upgrading. This cooperation can be done through different approaches and systems, such as a dual vocational training system, a cooperative education system, or other appropriate systems.” (Office of the National Economic and Social Development Board, 2016)

The challenges of the above plan were the preparation and the support for Co-op to benefit the most out of their Cooperative Education period. There are three main processes in Cooperative Education: Pre, During, and Post Cooperative Education. Pre-Co-op in Thailand, with a required 30 hours for the preparatory program, focuses more on the cognitive and knowledge skills for workplaces, such as resume writing, interviewing skill, workplace culture, planning and organizing skills. The During Co-op standard required professors to visit Co-op students once due to

the limitation of time and number of students. Post-Co-op is mainly the reflection on students' projects not learning outcomes.

In the new digital era, the graduate plays an important role as a transformative change agent for the regional and national economy. Graduates' employability skills and their abilities to combine the knowledge, experiences, attitudes, and entrepreneurship skills, which are valued by employers, needed to be addressed. There are challenges in higher education for institutions on their preparation to promote highly skilled employable graduates. There are many researches mentioned on the deficiency in necessary "soft skills" of graduates (Newton, 2015: 3). The UK Commission's annual report on employment and skills described the attributes of employability of graduates to be self-management, time management, teamwork oriented, business and customer awareness, communication and literacy, problem solving, , application of numeracy and information technology. Of all those underpinned attributes, the critical foundation was a "positive attitude: a 'can do' approach, a readiness to take part and contribute, openness to new ideas and a drive to make these happen" (UK Commission for Employment and Skills, 2010).

The previously mentioned concept echoed the principle of a growth mindset, of which Carol S. Dweck explained that mindset is a belief which leads to thought and actions and strongly effects every part of people's lives. People can become their desired selves and accomplish their value goals. The growth mindset helps students to embrace challenges, persist in the face of setbacks, see effort as the path to mastery, learn from criticism, and find lessons and inspiration in the success of others (Dweck, 2008: 10). The behaviors of individuals and responses to others come from people beliefs. If people develop a positive mindset, they might influence others to perceive

situations in a positive way. This is the self-fulfilling prophecy concept, “a false definition of a situation evoking a new behavior which makes the originally false conception come true” (Merton, 1948: 194). The self-fulfilling prophecy has an effect on the desired outcome, meeting expectations, achievement, and awareness to avoid negative action. These effects from growth mindset and self-fulfilling prophecy mirror the learning outcomes of students’ self-efficacy.

Self-efficacy is one of the effective predictors of students’ motivation and learning (Zimmerman, 2000: 82). In the academic world: “Self-efficacy has proven to be responsive to improvements in students’ methods of learning (especially those involving greater self-regulation) and predictive of achievement outcomes” (Zimmerman, 2000: 89; Schunk & Pajares, 2009: 49). Students with self-efficacy are believed to contribute to positive outcomes, which are goals, effort and persistence, learning and achievement, and activity selection. Therefore, researchers would like to find out more about the intervention of growth mindset, together with self-fulfilling prophecy, to enhance students’ self-efficacy.

As mentioned above, of the three main processes of Cooperative Education, the most important part was the preparatory curricula; Johnson (2011) recommended that the preparatory curricula helps to prepare students for workplace experience and during their transition period. Echoed by Sirijeerachai et al. (2014), the preparation enhanced the outcome, increased learning awareness, affected motivation, and increased interpersonal and communication skills. In addition, to keep student learning along the Cooperative Education period, the During Co-op and Post-Co-op parts via a digital platform to ease and enrich Cooperative Education students’ learning would be deployed.

As a result, there was the need to improve the efficiency and quality of the whole process of Cooperative Education by adding more soft skills in growth mindset and self-fulfilling prophecy and interactive processes into the existing process through so-called ‘intervention’. The result of this study will contribute to the quality of Cooperative Education students in lifelong learning through the efficient platform for cooperation linkages between the academic and industrial sectors, development of high-quality human resources for industry, and preparation of the workforce to have the requisite skills before entering the labor market, as in the Twelfth National Economic and Social Development Plan (2017-2021).

This study aims to design and develop growth mindset and self-fulfilling prophecy intervention and investigate the effects that enhance the self-efficacy of Cooperative Education students.

1.2 Research Objectives

The purposes of this study are

1.2.1 To design and develop growth mindset and self-fulfilling prophecy intervention to enhance Cooperative Education students’ self-efficacy.

1.2.2 To investigate the effects of growth mindset and self-fulfilling prophecy intervention on Cooperative Education students’ self-efficacy.

1.3 Research Questions

The explored questions are as follows:

1.3.1 What are the design and development of growth mindset and self-fulfilling prophecy intervention to enhance Cooperative Education students’ self-efficacy?

1.3.2 What are the effects of growth mindset and self-fulfilling prophecy intervention on Cooperative Education students' self-efficacy?

1.4 Research Hypothesis

The research hypothesis of this study are

Hypothesis a. There is a statistically significant difference in the pre-test and post-test of self-efficacy mean scores in experimental group.

Hypothesis b. All independent variables from growth mindset and self-fulfilling prophecy can predict the dependent variables of self-efficacy.

Hypothesis c. Co-op students express their positive attitude and gain learning outcomes toward overall intervention.

Hypothesis d. The intervention could be implemented by encouraging related stakeholders of Cooperative Education.

1.5 Research Scopes

The scopes of this study are

1.5.1 The variables of this study.

1.5.1.1 Independent variables are from growth mindset: (1) Embrace challenges, (2) Persist in the face of setbacks, (3) See effort as the path to mastery, (4) Learn from criticism, and (5) Find lessons and inspiration in the success of others and from self-fulfilling prophecy: (1) Desired outcome, (2) Meet expectations, (3) Achievement, and (4) Awareness to avoid negative action.

1.5.1.2 Dependent variables are (1) Goals, (2) Effort and persistence, (3) Learning and achievement, and (4) Activity selection.

1.5.2 The samples of this study are Co-op students from a public university in

Thailand. There are a total of 72 Co-op students, 36 in control and 36 in the experimental group.

1.5.3 The online tools used in this study included online questionnaire, online reflective journal template in a Google document, online group discussion, and individual interview session via the ‘ZOOM’ program.

1.6 Definitions of Terms

The definitions of terms in this study are

1.6.1 *Cooperative Education* is an education system which systematically alternates the student’s learning in the classroom on campus and in the workplace. The Cooperative Education course integrates knowledge between educational institution and workplace (Coll & Zegwaard, 2011: 297).

1.6.2 *Cooperative Education students* are students who enrolled in a Cooperative Education course; in this study ‘Co-op students’ refers to Cooperative Education students.

1.6.3 *Experiential learning* is the learning theory based on a four-stage learning cycle: concrete experience, reflective observation, abstract conceptualization, and active experimentation (Kolb, 1984). Co-op students learn through their real experience during the Cooperative Education period.

1.6.4 *Mindset* is people’s belief, whether or not they are aware of or unaware of it, which strongly affects every part of their lives. Changing people’s belief can have profound effect on their lives, as belief leads to thought and actions (Dweck, 2008:10).

1.6.4.1 *Fixed mindset* is the belief that intelligence is fixed at a certain level and one’s qualities are carved in stone. The fixed mindset students are likely to

avoid challenges, give up easily, see effort as fruitless or worse, ignore useful negative feedback, and feel threatened by the success of others (Dweck, 2008: 6-7).

1.6.4.2 ***Growth mindset*** is the belief that people can get better, learn, change, and improve. The basic qualities are things you can cultivate through effort. The growth mindset students embrace challenges, persist in the face of setbacks, see effort as a path to mastery, learn from criticism, and find lessons and inspiration in the success of others (Dweck, 2008: 6-7).

(1) ***Embrace challenges*** - Students who embrace challenges in life willingly accept and understand that setbacks are a normal part of life, and instead of fighting the setbacks, they embrace it. They see every challenge as a test of their true potential. Embracing challenges is a growth mindset; they know there will be failures before they reach their success, and embracing these failures and growing from them is the key to success (Oxford Dictionary, 2019; Dweck, 2006: 22-23).

(2) ***Persist in the face of setbacks*** - To continue to grow and make progress despite the challenges that come along the way. Students who persist in the face of setbacks confront their challenges directly; the more progress they make, the more determined they become. When things get difficult, they work harder and refuse to let setbacks hold them down. (Oxford Dictionary, 2019; Dweck, 2006: 33; Hereford, 2019)

(3) ***See effort as the path to mastery*** - Putting effort into work requires strong willpower, but also a growth mindset. Because there will be challenges along the way and students may not know a certain skill or task, they must have continued effort to push toward the bigger goal through practice. The effort to make the

physical and mental exertion is the path to success (Oxford Dictionary, 2019; Dweck, 2006: 41).

(4) *Learn from criticism* - Those who learn from criticism don't take criticism as only a negative assessment, but are rather open-minded about it. Students are able to listen carefully to criticism to better understand what is being assessed. Once they are able to find solutions and deconstruct the feedbacks, they will be praised for their initiative and willingness to improve and grow (Oxford Dictionary, 2019, Dweck, 2006: 24, 127).

(5) *Find lessons and inspiration in the success of others* - Gain influence and enthusiasm from others by surrounding themselves with what inspires them. See others as a source of positive influence in order to carve their own path to success. Seek connections and stories from successful people to inspire and motivate them (Dweck, 2006: 65).

1.6.5 *Self-fulfilling prophecy* is “a false definition of a situation, evoking a new behavior which makes the originally false conception come true” (Merton, 1948: 195). The self-fulfilling prophecy influences the desired outcome, achievement, meet expectation and the awareness to avoid negative action;

1.6.5.1 *Desired outcome* - The outcome of success is positive influence on others. By putting in hard work, having a vision, and taking action for goals and dreams, the result speaks for itself. (Bandura, 1977:195). The desired outcome of Cooperative Education are about the new skills, competencies, knowledge, and new learning. It also included the integration of the knowledge between campus and workplace. Co-op students learn more about the culture in workplace and the ability to realize the career development.

1.6.5.2 **Achievement** - Achieving anything requires students to have set high goals, worked hard, and done the best that they can. What that is may vary across cultures, societies, and countries, but achievement is a personal accomplishment; it requires a lot of effort, time, and dedication to achieve something great. (Dweck, 2006: 59, 61)

1.6.5.3 **Meet expectation** - Setting expectations in the workplace is common; meeting others' expectations requires setting clear and realistic goals. Students will not know how to meet others' expectations unless there is a clear objective of what needs to be accomplished. (McCane, 2008: V).

1.6.5.4 **Awareness to avoid negative action** - Having awareness in a professional or personal setting can help students avoid negative action. Having a good understanding of their own strengths and weaknesses can help them better assess what the next right action is. Additionally, recognizing how different actions impact their behavior and those around them can help pinpoint what to avoid and reduce stress and anxiety in the environment. (Bandura 1995: 9).

1.6.6 **Self-efficacy** is the belief in one's capabilities to organize and execute the actions required to manage prospective situations. Students with self-efficacy contribute to the outcomes, which are goals, effort and persistence, learning and achievement, and activity selection (Bandura, 1995: 2).

1.6.6.1 **Goals** - a task in which they feel confident, competent, and have the right incentives to take action. The high self-efficacy students set challenging goals and have a high commitment to achieve them. "The stronger the perceived self-efficacy, the higher the goal challenges people set for themselves and the firmer is their commitment to them." Self-efficacy is proven to be a consistent predictor of students'

outcome (Schunk & Pajares, 2009: 49).

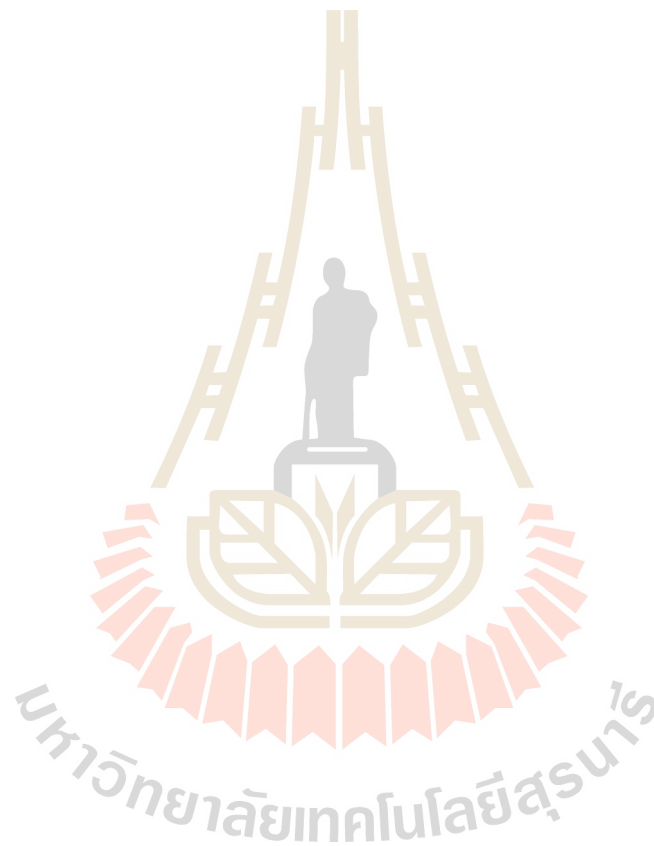
1.6.6.2 ***Effort and persistence*** - choices of setting and activities with sustained effort and perseverance in the face of obstacles and unfavorable experiences. Students who have stronger perceived self-efficacy are more likely to select challenging tasks with high persistence to perform successfully. These efficacy beliefs govern the motivating influence of outcome expectancies (Bandura, 1995: 7). “Self-efficacy beliefs contribute to motivation in several ways: they determine the goals people set for themselves; how much effort they expend; how long they persevere in the face of difficulties; and their resilience to failures (Bandura & Wessels, 1994: 5).

1.6.6.3 ***Learning and achievement*** - Self-efficacy influences performance through expectations, people capabilities and prompt incentives (Bandura, 1977:194, Schunk & Pajares, 2009: 38). The effectiveness of students affects ability to deal with different situations (Bandura, 1977:193). Confronting obstacles and failures, strong efficacy students remain task oriented and are able to get through the difficulties and control the threats. They use analytical thinking with a resilient sense of efficacy to attain performance accomplishments (Bandura, 1995: 6; Bandura & Wessels, 1994: 5).

1.6.6.4 ***Activity selection*** - Students act on their belief on their ability to do tasks, expected outcomes and performance. Self-efficacy provides students the choices of activities and environment in which they would like to take part. Students have different interests, competencies, and social networks from the choices they make (Bandura & Wessels, 1994: 7). There is a proverb reflecting this process: “You cannot prevent the birds of worry and care from flying over your head. But you can stop them from building a nest in your hair.” This is the way to eliminate the distress and anxiety which leads to avoidant behavior (Bandura, 1995: 9).

1.6.7 **Intervention** refers to the growth mindset and self-fulfilling prophecy intervention. This intervention consists of four parts: 1) growth mindset and self-fulfilling prophecy work session 2) online reflective journal 3) online group discussion and 4) individual interview session.

1.6.8 **ADDIE** model is an instructional design which has five major processes: analysis, design, development, implementation, and evaluation.



CHAPTER 2

LITERATURE REVIEW

This chapter discusses the related literature from various sources in relevant contents. The conceptual framework derived from theories and principles included experiential learning, Cooperative Education, students' learning outcome, mindset (growth and fixed mindsets), self-fulfilling prophecy theory, self-efficacy theory, intervention, and reflection.

2.1 Experiential Learning

The experiential learning approach aims to promote the actual mastery of work experiences through active learning. The emphasis is on the “connectedness” between theory and practice (Miller, 2001: 13). Kolb's model of experiential learning (Figure 2.1) emphasizes that it is a vital learning process. Learners observe and reflect on their own actions, then apply their learning to the work situations, which in turn promote “long-lasting learning” or lifelong learning (Kolb, Boyatzis, & Mainemelis, 1999: 28).

A four-stage learning cycle of Kolb's learning theory, so-called experiential learning. Kolb proposed that learners use their perceived experiences from a particular situation to reflect on the experience through their observations. These reflections are linked with previous knowledge and translated into abstract conceptualization, then create new ways of thinking and actions to be experiences which can be tested and explored. The new learning will be used to apply into new situations in the future.

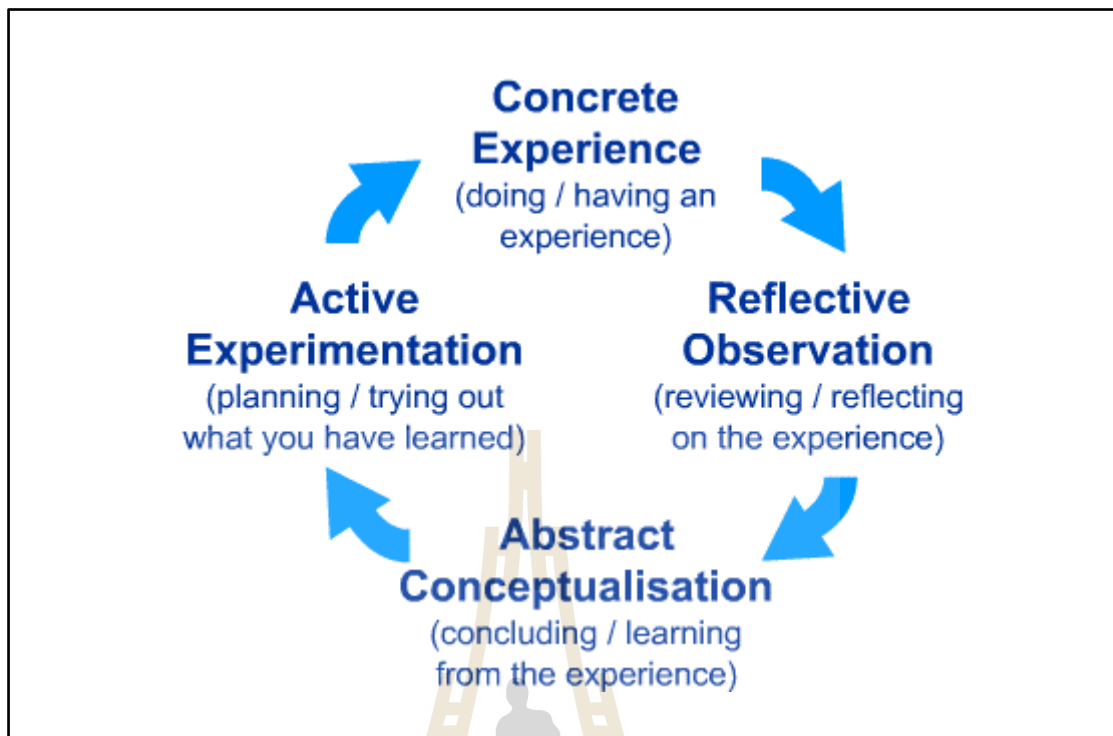


Figure 2.1 Kolb's cycle of experiential learning (ISC Medical, 2019)

For a more in-depth understanding of each stage, the following elaboration is shown (Kolb, 1984: 21):

1) Concrete experience – this stage emphasizes individual experience on a daily basis which creates individual feelings rather than a systematic approach. In this learning stage, the learners need the ability to adapt themselves and be willing to change.

2) Reflective observation – each individual may have different points of view on situations. Learners would reflect on their action through observation and then be able to express their own thoughts, feelings and opinions.

3) Abstract conceptualization – at this stage, learners use logic, theories, and concepts, to understand what happened in a certain situation. The feeling is less now. All knowledge is applied in the learning.

4) Active experimentation – the learning forms experimentation in other situations where learners can test their new learning. If the method and strategy are workable, this learning will move through stages of the cycle again.

The experiential learning strategy can be applied in both educational and organizational settings (Miller, 2001: 12). Experiential learning offers insight analysis which promotes long-lasting learning outcomes. The analytical skills taught allow students to recognize the relationship between the actual work and their own personal experience (Light et al., 2009:55). It also fosters learning comprehension and adaptation as the learners are challenged to apply their work skills for further self-improvement. This process also promotes flexibility in a deeper and more comprehensive guide for learners, to help them improve learning and designing a better method (Kolb et al., 1999: 28).

Experiential learning can be developed through unique curricula which combines research, clinical duties, teaching and learning evaluation, presentations, group discussions, peer assessment, teamwork, work experiments, problem solving tasks, independent work projects, and work reflection reports (Light et al., 2009:56). Also, Cooperative Education is considered as experiential learning (Billett & Choy, 2011: 25).

In summary, the experiential learning approach is to promote the connectedness between academic theory and actual mastery of work experiences through active learning. From Kolb's experiential learning model, learners make observations on day-to-day actions and behaviors, reflect for themselves, use logic, knowledge, theories to understand a situation, and then create their new learning which will be used for future situations. Once learners repeat the cycle they will keep learning through their lifetime,

or lifelong learning. This experiential learning in academic settings can be promoted through Cooperative Education, which allows students to get involved in the process and to learn by themselves.

2.2 Cooperative Education

2.2.1 Cooperative Education history

Cooperative Education was founded at the University of Cincinnati in the USA by Dean Herman Schneider in 1906. His vision in terms of educating an engineer was: “if you want to educate a student to become an engineer, then you should provide that student with the opportunity to practice being an engineer” (Cooperation Education and Internship Association [CEIA], 2017). From his observation and experience, he believed that “many professional concepts and skills could not be learned effectively in the classroom, but required practical experience for their understanding and mastery”. After several years looking for effective ways to help his engineering students, he started his ‘Cooperative’ plan. His proposal offered the “coordinated alternation of on-campus study and off-campus, real-world, paid experiences” (Sovilla & Varty, 2011: 3). With the changes in industrial expansion, higher education had to respond by educating students with specific skills to relate to real-world careers. Schneider’s plan was appropriate at that time.

The Cincinnati Plan’ spread to various institutions and engineering schools. In 1919, the first Cooperative Education program outside of engineering faculty was formed in the business-related field of study at the University of Cincinnati. In 1926, the first professional association, the Association of Cooperative Colleges, was established. The expansion to other fields, like business, confirmed that Cooperative Education can be used to educate students in most disciplines (Sovilla & Varty, 2011:

4). In 2011, the World Association for Cooperative Education (WACE) reported a total of 4,000 members from 36 different countries, and papers demonstrate that the Cooperative Education approach is globally significant with programs in educational institutions worldwide.

2.2.2 Cooperative Education Definitions

The term ‘Cooperative Education’ is used and defined worldwide according to educational institution value placed. The founding university, the University of Cincinnati, defined Cooperative Education as “an educational model in which students alternate traditional academic semesters with semesters spent working full-time in their chosen field” (University of Cincinnati, 2017). In addition, from the Edison Foundation’s first Cooperative Education conference in Ohio, USA, a definition of ‘Cooperative Education’ was stated as: “it is alternating on-campus and off-campus schedule offered as an economical way to accommodate growing numbers of college-bound students” (Sovilla & Varty, 2011: 5). Coll & Zegwaard (2011: 297) gave definitions of Cooperative Education as an education system which systematically alternates the student’s learning through classroom in campus and workplace. It involves the integration of knowledge between academic and workplace where students take what was learned on campus into the workplace and vice versa. “Cooperative Education also counts as academic credit for career work which is taking on new importance in school-to-work transition, service learning, and experiential learning initiatives” (CEIA, 2017).

Recent Cooperative Education programs used globally have defined the term differently but are generally aligned in meaning, for example:

“Cooperative Education Program means a program which alternates periods of academic study with periods of work experience in appropriate fields of business, industry, government, social services and the professions” (Canada, 2017).

“Cooperative Education Program (Co-op) is an internship program that gives students an opportunity to receive career training with pay as they work with professionals in their major fields of study” (Engineering Career Center, 2017).

“Cooperative Education is a structured method of combining classroom-based education with practical work experience. A Cooperative Education experience, commonly known as a “Co-op”, provides academic credit for structured job experience. Cooperative Education is taking on new importance in helping young people to make the school-to-work transition, service learning, and experiential learning initiatives” (Center for Career Discovery, 2017).

“Cooperative Education (Co-op) is a structured method program that offers students the opportunity to alternate periods of academic study with periods of work closely related to their major field of study. The combination of academic study and work produces an overall learning experience that gives greater meaning to students' studies and more direction to career development” (Kettering University, 2017).

“Cooperative Education is an educational system focusing on systematic practical experience in the workplace in which the periods of study and the periods of working in the real workplace are combined. For practical

experience, the work for students should be in their field of study concentrating on learning from working experience or work-based learning” (Georgia Tech Center for Career Discovery and Development, 2017).

“Cooperative Education is work-based learning in which the time spent in the workplace forms an integrated part of an academic program of study” (Johrendt et al., 2009).

“Cooperative Education is an educational system focusing on systematic practical experience in the workplace in which the periods of study and the periods of working in the real workplace are combined” (SUT, 2017).

The various definitions of Cooperative Education given reflect similar objectives of the program. In conclusion, Cooperative Education is a structured method which alternates periods of academic study and work experience closely related to a major field of study in industry, government, social services, or profession. Students had the opportunities to integrate their knowledge and work experiences, receive career experience with pay, and work with professionals (mentors) in their field so they are able to create their own learning.

In Thailand, a concept of Cooperative Education has been adopted which comprises three different phases: input, transformation, and output. “The transformation phase entails interaction between the learner, the learning content, the learning environment, and the learning coordinator - all components of the learning climate” (Groenewald et al., 2011: 21). The learner refers to both the student in university and the employee in the workplace.

2.2.3 Benefits of Cooperative Education

Cooperative Education benefits three stakeholders: students, workplaces, and educational institutions.

Students are provided with basic content knowledge and theory from the campus and practical and real-world situation content through project and program placement (Coll et al., 2009: 1). The experience in work placements also provides significant other learning which enhances and expands skill and knowledge received from university. The differences in learning between campus and workplace provide the views in a practical way to students (Eames, 2003: 14). Students learn more in behavior, ways of working, and ways of thinking in workplace culture and become more self-directed and confident in operational work. Cooperative Education helps to improve academic performance (Pratan et al., 2012: a). The experiences provided a range across new experimental, analytical and social skills which help in future employability and career development. Students can get jobs faster and of higher starting income (Luekitinan et al., 2015: 105). Moreover, the outcome of Cooperative Education is to develop a graduate to be a reflective practitioner which is an emerging professional requirement (Coll & Zegwaard, 2011: 297). To achieve this, students need to learn how to apply the theory through new classroom activities such as simulation and project-based learning (Luekitinan et al., 2015: 105).

Generally, the workplaces seek graduates who are ready to work with professional knowledge, systems thinking, and responsibility. Research indicates that “one of the attributes employers value most in newly hired employees is work experience” (Linn et al., 2004). In 2006, WACE did a survey of Cooperative Education employers and found that they were able to recruit and retain motivated and enthusiastic

students who can deliver high performance under pressure. Employers tend to utilize Cooperative Education as cost-effective in employee training and recruiting. Last, but not least, employers were willing to give their contribution to education and professional development in return (Braunstein et al., 2011: 283).

The educational institutions benefit in brand building, competitive advantage, and parent and student attraction, amidst a challenging and interconnected world. With community engagement, educational institutions have knowledge exchange from outside, and get input for development in curriculum and research and development. For the international perspective, the institutions are recognized by the business and investment companies which can strengthen their financial status (Crump & Johnsson, 2011: 287; Orrell, 2004).

The following section outlines more on the central learning theories in Cooperative Education.

2.2.4 Theories of learning in Cooperative Education

Van Gyn and Grove-White (cited in Eames & Cates, 2011) provided the perspectives on learning framed by three orientations: transmission, transaction, and transformation. For Cooperative Education, the focus would be on learning theories within the transaction orientation of cognition and pragmatism (Eames & Cates, 2011:41). The following are the theories that support learning in Cooperative Education.

As mentioned above, Cooperative Education utilizes the experiential learning model as one of the supporting theories. There are more applicable theories that need to be addressed.

- 1) Piaget's Cognitive-Development Theory: Students develop their reasoning

strategies related to classroom and workplace while they are on projects or assignment. Three fundamental processes in the development of logical thinking are assimilation, accommodation, and equilibrium, which emerge from work naturally. The Cooperative Education students develop their logic in the classroom and then shift to the logic at their workplace. This is why Cooperative Education students make the transition to work faster than non-Cooperative Education students (Eames & Cates, 2011: 43).

2) Akinson's Model of Achievement Motivation: One of Akinson's models of achievement motivation is the expectancy-value model which is able to describe student motivation. Akinson defines expectancy as "the student's belief regarding his/her probability of success (or failure) on a particular task and value as the value the individual attaches to the success or failure of the task". Students learn from their past success and failure and this underpins their belief in probability of future successes. Moreover, the value the students place on the task affects their perception and belief in terms of achieving a goal (Eames & Cates, 2011: 44).

3) Bandura's Social Learning Theory: Bandura found "the consequences of behavior are essential to learning but not limited to that of the learner". Students learn from vicarious consequences by observing their colleagues' behaviors and consequences in the workplace. Cooperative Education students learn from their own successes and failures as well as those of others (Eames & Cates, 2011: 44).

4) Reflection-in-Action: Schon (Cited by Eames & Cates, 2011:45) Students must apply past knowledge into a new situation with the reflection practice having taken place. This reflection happens either as individuals or with assistance of reflective dialogue with a coach, mentor or teacher, in framing knowledge into critical inquiry.

5) Action and Active Learning: Students take the initiative for learning and reflection on the action (Eames & Cates, 2011: 46).

6) Centralized Role of the Learner: Students take a role in learning and take advantage from any social setting. Students become self-aware in reflection on personal and professional development (Eames & Cates, 2011: 46).

7) Sociocultural Views of Learning: Learning is a social process and takes place in social situations. Cooperative Education students participate in a social community in the workplace and engage in real situations and activities. The distributed cognition is from a community of practice where Cooperative Education students can participate and learn from the situations (Eames & Cates, 2011: 46).

In summary, the above theories support Cooperative Education, showing that it is vital to integrate both academic and workplace learning elements. The learning theories involve the cognitive development which students can develop in logical thinking. Since the motivation in learning is also important, the expectancy theory leads students in their belief in achieving goals. Cooperative Education is a form of social learning; students interact with others and learn behaviors in the workplace through observation. To achieve learning, students need reflection during their practice and need to get involved in their learning.

2.2.5 Cooperative Education development areas

Sovilla & Varty (2011: 13) discussed the areas of Cooperative Education needed for considering future development. These are academic credibility, employer partnership, assessment, accreditation, and generational differences.

The first need is to increase academic credibility through achieving the learning outcome of the program. Students and educators need to understand, prioritize,

and set student learning outcome based on student knowledge and employer needs. The second area is the employer-educational institution relationship, which is the key to success of Cooperative Education through mutual benefit. Educational institutions must keep connection and communication with employers to receive feedback and suggestions for curriculum improvement. The third area is program assessment which ensures the student learning outcome is successful.

There are new tools available for monitoring student development throughout the course. At Kettering University (USA), electronic evaluation has been developed and used for students and employers to give feedback online and make use of the collected data. The fourth area of Cooperative Education that needs to be considered for future development is accreditation. Since learning outcome is increasingly emphasized for accreditation and professional certification, Cooperative Education needs to report student learning in a more meaningful way and be perceived as highly valued as an academic program. The last area is about generational differences. The Cooperative Education modification for a new generation needs more flexibility to meet students' needs. The millennial generation has grown up with the internet and technology and they demand speed and customization.

The future development of Cooperative Education needs to cover many areas; for instance, student learning outcomes, employers' benefits and educational institution support, the assessment, new tools, and generational response. However, in this study, the researcher pays particular interest to developing Cooperative Education student learning outcomes with the right assessment, especially with the generational differences taken into consideration.

2.2.6 Cooperative Education in Thailand

Thailand is one of the countries which provides Cooperative Education to higher education students. The first university in Thailand, Suranaree University of Technology (SUT), started program in 1993, founded by Professor Wichit Srisa-an. And in the year 1999, the Thai Association for Cooperative Education (TACE) and the Office of Higher Education Commission (OHEC), collaborating with Suranaree University of Technology, set up standards for Cooperative Education and announced them publicly for educational institutions in Thailand.

2.2.6.1 Cooperative Education objectives

Cooperative Education is defined as integrated learning from campus and real work experiences, with the following objectives (Srisa-an, 2009: 8):

- 1) To prepare students in career development and develop skills for their employability
- 2) To gain experiences in academic, professional and self-development
- 3) To provide the opportunities to the workplace in developing the qualities of students
- 4) To develop curriculum to meet workplace expectations
- 5) To build the relationship and network between the workplace and educational institutions through Cooperative Education students and practitioners

Suranaree University of Technology aligned the Cooperative Education objectives and announced the program objectives as stated below (SUT, 2017):

- 1) To enhance the professional experience and self-development of students that can be valuable over the years

2) To provide both public and private enterprises an opportunity to participate in developing the quality of graduates

3) The development of curriculum and updated teaching and learning

4) To promote and establish the relationship between the university and the workplaces via the students' placements

2.2.6.2 Cooperative Education process

Initially, the work experience learning starts from the preparation as well as from academic coursework. The curricula have been designed in three phases: (1) a preparatory curriculum which focuses on students' preparation for workplace experience, (2) an academic curriculum through courses for program of study, and (3) a workplace-based emergent curriculum. Those three curricula play an important part in creating students' learning outcomes (Johnston, 2011: 305).

The standard for Cooperative Education was set up by the Thai Association for Cooperative Education (TACE) and the Office of Higher Education Commission (OHEC), collaborating with the Suranaree University of Technology. The following are some parts of the Cooperative Education standard related to this study:

1) University provides the orientation of the Cooperative Education program to Co-op students to ensure the understanding of the principle and benefits of the program.

2) University provides at least 30 hours of preparatory program for Co-op students prior to their Cooperative Education.

3) The Cooperative Education period is at least 16 weeks of continuous full-time work at the workplace.

4) University finds the workplace where can support Co-op students' projects which are related to their field of study.

5) Professor visits their Co-op students on-site at least once, and one hour per visit.

6) University holds the seminar for Co-op students and professors to share the learnings of Cooperative Education.

Even though the learning occurs through all these process steps - before, during and after the work placement - the Pre-Co-op is the first process to help students in their preparation to adapt themselves to the new workplace environment (Johnston, 2011:305). There are different preparatory programs for students; the educational institutions have to provide the appropriate one to ensure a successful student learning outcome from the Cooperative Education program.

Johnston recommended the preparatory curriculum from several examples of Cooperative Education from across North America that the preparatory curriculum should provide skills for students to enable them to transfer knowledge, practice and learn new things in a new environment. The students need to have opportunities to get involved in their own learning to ensure authentic learning and assessment (Johnston, 2011: 310). Wendy Hastings's study showed that the preparation enhances the learning outcomes for all participants in terms of increased motivation, awareness of learning needs of educators and students, improved communication skills and networks, and institutional involvement (Hastings, 2013: 3). A preparatory work session should be provided to students and one of the topics which should be included is to set up the specific goals and learning for their work experience, drafting a plan and providing the means to monitor the result (Alderman & Milne, 2005: 8).

The Pre-Co-op programs were conducted under various names and methods: professional development, professional development seminar (Molitor, 2017), work readiness workshop, e-WIL program¹, VoB-coach² program, and game and simulation (Namibia University of Science and Technology, 2017).

In addition to standard Cooperative Education in Thailand, Wichit (Founder of Cooperative Education in Thailand) reviewed some preparatory programs and recommended to add more skills which students need to develop; namely analytical/strategic thinking, effective/ English communication, creativity/innovation, problem solving/decision making, and planning (Srisa-an, 2009: 28-30) which are critical skills for 21st century learning skills (Partnership for 21st Century Learning, 2016).

To enhance learning during their experience in the workplace, students should be prepared on how to think and how to learn through their experience. The important thing is to encourage students to find opportunities to engage in workplaces which help to progress them from student to practitioner (Eames, 2003: 14). Research shows that the mindset of the student plays an important role in academic performance and success (Auten, 2013: 41).

¹ e-WIL programme which is an online training initiative aimed at providing all students, inclusive of those studying part-time and on distance mode, with the necessary preparation for WIL.

² The VoB Project was born out of a partnership between NUST, Vaal University of Technology in South Africa and Hochschule Wismar University of Applied Sciences. Students from the three universities cooperate and share expertise and best practices to provide solutions to problems presented by industry. Other objectives of this project, funded by the German Academic Exchange Service (DAAD), are to enhance the employability of students and promote and strengthen internationalization.

Hence, regarding the importance of the preparatory curriculum, there are points from the survey which are interesting, such as how to help students in their authentic learning, goal setting, and engagement in their own learning. This study focused on the whole process (Pre-Co-op, During Co-op, and Post-Co-op) to enhance student learning outcomes in Cooperative Education by promoting students on how to think and reflect During Co-op and Post Co-op.

2.3 Co-op Students' Learning Outcome and Assessment

Cooperative Education is a continuing process creating knowledge when theory and practice mutually reinforce one another (Alderman 2005, 15). Enhancement of student learning is the key outcome of Cooperative Education (Johrentd et al., 2009: 4). Learning occurs through the close interlink of tertiary studies and work-based experience. It builds on students' stages of development, so students must assess past and present achievements, identify goals, reflect upon what and how they learn to build new knowledge, and set future directions (Alderman, 2005: 15).

Brodie and Irving (2007) commented on students' learning needs specifically in Cooperative Education as: know what learning is and how to make it most effectively, know what the learning under scrutiny is, reflect on what students are learning, analyze and evaluate learning, and recognize what future learning is needed. Overall, student learnings are what knowledge students learn from the course whereas student learning outcome is "what students are expected to know or be able to do upon completion of a course or program" (University of Wisconsin-Madison, 2017). The students learning outcome is also defined as the set measurable and essential mastered knowledge including skills, competencies which students acquire and demonstrate after

course completion. The following are examples of Cooperative Education student learning outcomes.

Cates & Jones (1999) provided Cooperative Education student learning outcomes:

“Learning that is related to the student’s curriculum: Cooperative Education provides students with the opportunity to develop specific competencies, professional skills and technical knowledge related to their academic majors. Students to learn from professionals in the field for which their disciplines are preparing them.”

“Learning that is related to the “World of Work”: Through Cooperative Education, students are able to develop a better understanding of how to interact with others in the workplace. They develop an understanding of the culture, technology, and practices of employing organizations”.

“Developing connections between theory and practice: The coordination of work experiences with the campus educational program provides a closer relationship between theory and practice; therefore, students find more meaning in their studies. Students develop greater clarity about their academic goals because they have been able to see the connections between academic theory and workplace practice”.

“The ability to test aptitudes and career goals: Cooperative Education provides students with the ability to learn about options as they define career plans and clarify their career goals. They are able to explore their abilities and determine their strengths and weaknesses”.

“The transition from student to professional: During the transition from student

to full-fledged professional employee, Cooperative Education students are developing a sense of responsibility and maturity. They are learning to rely on their own judgements and learning to view themselves less as a student and more as a “professional” (Cates & Jones, 1999: 3).

Northeastern University in the USA aims to provide “deep, flexible and robust” learning for their students to prepare them for achievement in a changing world. The Cooperative Education program aims for student learning outcomes where students are able to:

- “1) Integrate knowledge and skills learned in the classroom and Co-op to identify and solve problems.*
- 2) Gain new knowledge and develop new skills to successfully engage in unfamiliar activities and projects.*
- 3) Identify and leverage opportunities to learn beyond the classroom.*
- 4) Articulate the intellectual skills that underlie the work they engage in.*
- 5) Assess, critique, and improve their work.*
- 6) Adapt their behavior to different audiences they interact with (e.g., communicate, self-representation, etc.).*
- 7) Behave professionally in various environments (i.e., team, independent, etc.) by adhering to ethical standards and being accountable for their commitments”*
(Northeastern University, 2017).

Nova Scotia offers its Cooperative Education program with the purpose to provide students integrated educational and personal interests, values with career exploration, personal growth, planning, and development. The program sets the student learning outcome as: understand and actively participate in the career building process;

demonstrate workplace readiness by identifying personal traits, strength, weakness, abilities and employability skills; understand workplace culture; and understand workplace safety knowledge (Scotia, 2013: 1-9).

Thailand's Suranaree University of Technology categorizes Cooperative Education student learning outcomes into six categories: ethics and moral, knowledge, cognitive skill, interpersonal and accountability skills, analytical and communication skills and technology literacy, and psychomotor³. To elaborate on each category, the ethics and moral component is for students to demonstrate their own accountability, discipline, leadership, team collaboration, respect to others, and professional ethics. The second category is knowledge from which students are able to learn and apply key principles and theories. The experiences gained from the workplace can be integrated to existing knowledge both in professional and social skills according to market needs. The third category is cognitive skill with which students can think systematically to solve real-world problems by applying and integrating gained knowledge to new situations. With the fourth category, interpersonal and accountability skills, students alternate the roles as leaders and followers in working as a team. They learn to be accountable in team work. Students demonstrate analytical and communication skills and technology literacy through their ability to access the source of knowledge with suitable technology and analyze the information to solve problems. Students also can communicate through appropriate media effectively. The last category is 'psychomotor', where students develop their own personality and English conversation for daily use.

³ The psychomotor is an additional student learning outcome to the national standard learning outcome set by OHEC.

The student learning outcomes differ according to the values of the various educational institutions (Alderman, 2005: 2). However, all include both academic and work experience outcomes. Once the outcome is set, the assessment should be put in place to ensure the relevant training and achievement of the program.

Assessment refers to both process and the student learning outcome. The right assessment process needs to be authentic and with a student-centered approach. Eames (2003) and Johnston et al. (2004) (cited by Hodges) reported that “student learning derived from Co-op experiences is broad in nature, complex and individual, influenced by a myriad of contextual factors involved” (Hodges 2011: 53). The academically structured assessment may not solely be the solution since Cooperative Education students work interdependently which requires the assessment to be varied according to the complexity of the workplace. In addition, students are different in their starting points, their goals, needs and expectations. Therefore, assessment needs to be authentic and sustainable. Authentic assessment is done through involving students in their self-assessment and performance, which benefits students in transferring skills to workplace and professional practice. The personalized learning outcomes, together with objective and measurable criteria, help the students who are able to explore and practice flexibly (Hodges, 2011: 53-58). Keating 2006 (cited by Hodges) suggested that authentic context-focused assessment tools like evidence-based work reports should be used in the workplace (Hodges, 2011).

Boud (2000: 1) wrote about sustainable assessment which should “meet the needs of the present without compromising the ability of students to meet their future learning needs”. If we need lifelong learning assessment, the first focus should be on student learning prior to the effectiveness of measure of achievement. Workplace

learning happens through engagement in daily activities, observation and interaction with others, which enable students to contextualize their learning and integrate into cultural settings (Hodges, 2011: 56).

Besides authentic and sustainable assessments, there are two purposes of assessment, summative and formative. The summative refers to student performance, either the final assessment like the grade and achievement, or at the different stages of the study like assignments, projects and so on. It is a single process following the given criteria or standard. The formative assessment is about helping students to improve their learning and is considered as an additional step to summative assessment and uses judgements for further improvement (Taras, 2009: 58). The formative assessment involves “a cycle of feedback, adjustment, implementation, and reassessment (Cedercreutz & Cates, 2011: 66) and works through effective communication (Hodges, 2011: 54). However, both assessments should contribute to students’ improvement and be sustainable.

To achieve students’ learning outcome, first, the active participation in the assessment process of students is vital. Second, the assessment is an act of students, not by others. Students need to be involved in self-monitoring, evaluation and making progress toward their goals. McDowell and Sambell observed that “students appreciate assessment tasks which help them to develop knowledge, skills and abilities which they can take with them and use in other contexts such as in their subsequent careers” (McDowell & Sambell, 1999: 81). This process enables students to “judge the quality of what they are producing and be able to regulate what they are doing during the doing of it” (Sadler, 1989: 119).

Two components of Cooperative Education learning outcome are workplace

performance and student learning and development. The workplace performance assessment mainly focuses on knowledge, competencies, skills, attributes, culture, personal qualities and self-reflection. The student learning and development, by its nature, “is a continuous process activity that leads to human development” through reflection (Hodges, 2011: 56). Brodie and Irving seconded that critical reflection as it “enables students to justify and validate their claims for learning, by using a variety of evidence sources. It also enables them to recognize future learning needs, essential for developing a capacity for lifelong learning” (Brodie & Irving, 2007: 15). The critical reflection part should be identified whether it is on the reflection process or the learning product so that the activities and assessment can be focused on (Hodges, 2011: 58). The reflective process involves theory, evidence, and practice to apply the learning in a future situation. This can be done in writing, such as in learning journals, logs, and summaries (University of Bradford, 2017: 4).

A reflective journal is commonly used in the reflection process for students to express their learning in their own way. The sustainable and authentic approach to Co-op assessment through a reflective journal helps students to control and be responsible for their performance, and to know their strengths and weaknesses (Hodges, 2011: 60). To help students in their learning, there should be a process to help them reflect on their performance in relation to the workplace and be able to set up their widely important goals to focus on in the future. (Hodges, 2011: 54).

In conclusion, student learning is one of the crucial parts of a Cooperative Education program. A solid program assessment involves both process and student learning outcomes. The right assessment program needs to be authentic and sustainable. Since each student comes from a different background, capability, and different field

of profession, the assessment needs to be individualized according to their set goals and involvement in their own process. Also, in authentic and sustainable assessment, there are two purposes of assessment: summative and formative. Summative assessment is about the criteria or standard while the formative is about further improvement through feedback. To achieve student learning, the mindset of students and academia needs to be shifted; first, students fully participate and second, the response toward the situation. Therefore, students should participate in their own learning through the reflection which enhances authentic and sustainable learning. The reflection process involves theory, evidence and practice through the reflective journal writing, logs, or summaries. It enhances student control of their own actions and behaviors so they can then be aware of their own strengths, weaknesses, and need for future action.

In this study, the researcher uses both formative and summative assessment for assessing the student learning. The focus is on students even though the other parties, like academia and employers, are closely involved in a Cooperative Education program. The tool of the online reflective journal will be used to ensure student involvement and engage them in their own learning.

To enhance the student learning, rather than the objective knowledge and skills, the way to think, feel and motivate to learn is so critical. The next section covers the mindset and motivation theories which enhance students' learning.

2.4 Mindset

To the question of 'why people differ?' the answers come from two sides; first, because of different physical, phrenology, craniology and genetic factors, and second, variables related to people's backgrounds, training, and way of learning (Dweck, 2008).

Some differences stem from 'mindset'. What is mindset? There are various

given definitions of mindset:

“A mindset is a belief that orients the way we handle situations—the way we sort out what is going on and what we should do. Our mindsets help us spot opportunities but they can trap us in self-defeating cycles.” (Klein, 2016)

“An inquiry into the power of our beliefs, both conscious and unconscious, and how changing even the simplest of them can have profound impact on nearly every aspect of our lives.” (Popova, 2017)

“A fixed mental attitude or disposition that predetermines a person's responses to, and interpretations of, situations.” (Farlex, 2017)

“Mindset is mental attitude that has taken shape, based on life experiences, environment, education and the ideas and beliefs absorbed from those people whom the subject has interacted with in their lives.” (MIND-SETS, 2017)

“Mindset is the belief which limits potential or enables success. It often marks the difference between excellence and mediocrity. It influences self-awareness, self-esteem, creativity, ability to face challenges, resilience to setbacks, levels of depression, and tendency to stereotype, among other things.” (Vermeer, 2012)

“Mindset is people’s belief, whether or not they aware of it, which strongly affects every part of lives. The mindset also refers to the ways of thinking about the goals we pursue in professional and personal lives. It determines how people interpret their success or failure.” (Dweck, 2008:10)

Related to concepts of mindset is a question of whether mindset can change. To answer this question requires a look at the neuroscience which explains how the brain works. Neuroscience of learning refers to how the central and peripheral nervous system

work together to create and retain new knowledge and skills (Adreatta, 2016). Lara Boyd, physical therapist and neuroscientist, has studied neuroplasticity and found that the brain plasticity supports all learning and that specific interventions can facilitate positive plasticity throughout life. The brain capacity can be adapted and influenced by behaviors which enhance plasticity through practice (Boyd, 2014: 5). Human potential and abilities can be developed by practicing and changing a belief system. Potential is “The capacity to become or develop into something in the future-unrealized ability” and reached through learning. People have potential to become and grow. (Adreatta, 2016)

Mindset is belief which leads to thought and actions and strongly affects every part of people’s lives. From Carol’s research, it is shown that “the view you adopt for yourself profoundly affects the way you lead your life”. People can become their desired selves and accomplish their value goals (Dweck, 2008:10). The mindset influences the way we understand our own experiences in the workplace and determines the nature of our emotional, cognitive, behavioral and neutral responses to experiences (Halvorson et al., 2015: 3).

Earlier than Dweck’s mindset definition, in 1989, Stephen Covey also proposed that people look through their own lens with which they see the world and it shapes how they interpret the world. If people would like to change a situation, they need to start changing their perceptions. Covey uses the word ‘paradigm’ to explain more on human perception. The word ‘paradigm’ comes from the Greek ‘Paradigma’. It means a theory, assumption, model, perception, or frame of reference. In a more general sense, it is the way people ‘see’ the world, in the sense of perceiving, understanding and interpreting things around them. A paradigm is like a ‘map’ of life. There are two

categories of maps: the maps of the way things which are reality, and the maps of the way things should be which values are. Covey further said that “we interpret everything we experience through these mental maps. We seldom question their accuracy; we’re usually even unaware that we have them. Attitudes and behaviors grow out of these assumptions. The way we see things is the source of the way we think and the way we act” (Covey, 1989: 25-32). People always think that they see the world as it is, when in fact they see the world as they are. These personal paradigms are the sources of the attitudes, behaviors and relationships with others. A new level of thinking – new paradigm – will help to solve problems, as Albert Einstein observed: “The significant problems we face cannot be solved at the same level of thinking we were at when we created them. The change of paradigm needs to start with self, we need to think differently to meet our deepest concerns.”

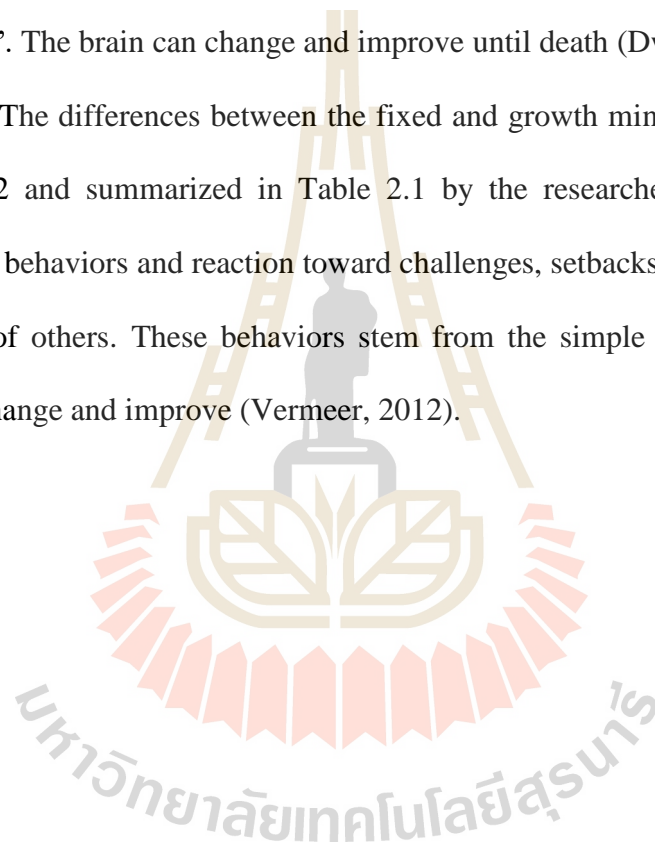
The two words of mindset and paradigm are similar in their definition. The Urban Dictionary states that the definition of paradigm is the same as that of mindset, relating to how people treat daily events and handle situations (Urban Dictionary, 2012). Recently, Dweck has introduced a new concept of mindset, differentiating ‘fixed’ and ‘growth’ mindsets to help people to understand their own belief systems and develop them.

2.4.1 Fixed and growth mindsets

People’s belief, mindset, can mark the difference between who are excellence and mediocrity, according to some researchers. It influences self-awareness, creativity, self-esteem, ability to embrace challenges, resilience to setbacks, depression levels, and stereotype, among other things. Therefore, it can limit potential or enable success (Vermeer, 2012).

In postulating two kinds of mindsets, fixed mindset and growth mindset, one is helpful for people learning, another is not. The first one, a fixed mindset, retains the belief that people are set as who they are and have a certain level of intelligence and skill which cannot change. People's qualities are carved in stone. Whereas the growth mindset theory puts forward the belief that people can be better, learn, change, and get improved. The basic qualities are "things that can be cultivated through effort to learn and improve". The brain can change and improve until death (Dweck, 2008: 6-7).

The differences between the fixed and growth mindsets are summarized in Figure 2.2 and summarized in Table 2.1 by the researcher. People's mindsets influence the behaviors and reaction toward challenges, setbacks, effort, criticism, and the success of others. These behaviors stem from the simple belief about people's abilities to change and improve (Vermeer, 2012).



Two Mindsets

Carol S. Dweck, Ph.D. - Graphic by Nigel Holmes

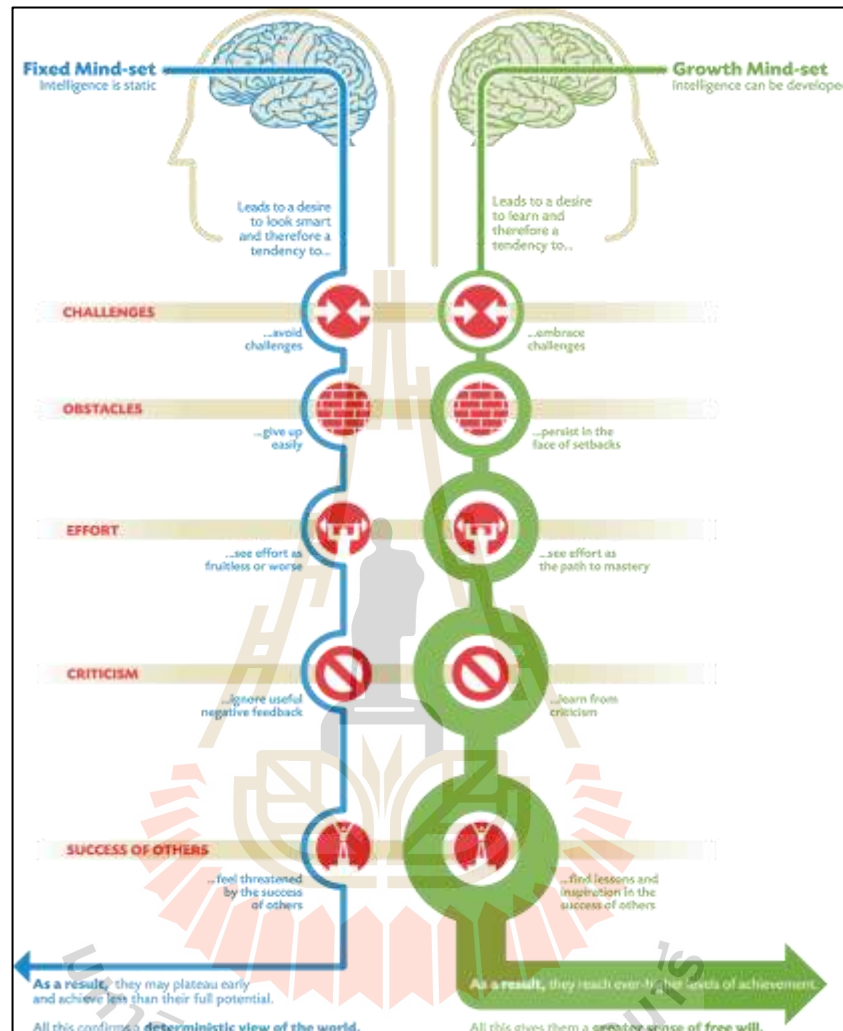


Figure 2.2 Differences in fixed and growth mindsets by Nigel Holmes

(Egbert et al., 2013)

Fixed mindset people focus on permanent traits, found challenge fearful and devalue their efforts. They believe that intelligence is a static attribute. When facing a challenging situation, the fixed mindset people create the feeling of failure and paralysis, they label themselves and get stuck. They have concerns about how they will be judged. The fixed mindset affects life apparently; people become fixed mind setters

and can ruin their professional life such as CEO disease – “Speaking of reigning from atop a pedestal and wanting to be seen as perfect” and leading to failure (Dweck, 2008: 21). The fixed mindset can create a sense of urgency to succeed perfectly and immediately. One of the pitfalls is the self-esteem to encourage thinking to be superior and turn to mean better than others (Dweck, 2008: 30). They create an urgent need to prove themselves over and over. Their confidence may be fragile and they easily give up with setbacks and put in less effort. Criticism to them is harmful on their character and to be avoided so there is no effort and a tendency to stop taking any actions at the end (Vermeer, 2012). Fixed mindset people tend to have higher depression rates and refuse any given feedback so then there is no development. Finally, they are likely to set back their full potential to achieve goals (Dweck, 2008: 31).

Growth mindset people believe that the intelligence can be developed because people’s potential is unknown and unknowable. With this belief, people create a passion for learning, stretching themselves, and sticking to it when there are any obstacles (Dweck, 2008: 7; Vermeer, 2012). They recognize change and decide which changes are most valuable to put their effort into (Vermeer, 2012). The growth mindset allows people to grow through the most challenging situations in their lives and stretch to reach their true potential (Dweck, 2008:7). They view criticism as valuable feedback and openly embrace it. They can convert setbacks into future success through confronting challenges and keep working to overcome obstacles (Vermeer, 2012). The growth mindset people will be open to accurate information about their own abilities and therefore learn more effectively with high input of effort. Howard Gardner concluded that extraordinary individuals have “a special talent for identifying their own

strengths and weaknesses” which seems to be evident in growth mindset people (Dweck, 2008: 7-11).

Having a growth mindset is to decide to dedicate time and effort to develop required skills (Vermeer, 2012). From Figure 2.3, the growth mindset people have a belief that intelligence can be developed, lead to a desire to learn and therefore a tendency to embrace challenges, persist in the face of setbacks, see effort as the path to mastery, learn from criticism, and find lessons and inspiration in the success of others. Consequently, they reach ever-higher levels of achievement and all this give them a greater sense of free will.

From Figure 2.2, Table 2.1 displays the summary of the effect of fixed and growth mindsets.

Table 2.1 The effect of fixed and growth mindsets

	Fixed Mindset	Growth Mindset
Beliefs	Intelligence is static	Intelligence can be developed
Challenges	Avoid challenges	Embrace challenges
Obstacles	Give up easily	Persist in the face of setbacks
Effort	See effort as fruitless or worse	See effort as the path to mastery
Criticism	Ignore useful negative feedback	Learn from criticism
Success of Others	Feel threatened by the success of others	Find lessons and inspiration in the success of others

Table 2.1 The effect of fixed and growth mindsets (Continued)

	Fixed Mindset	Growth Mindset
As a result	They may plateau early and achieve less than their full potential. All this confirms a deterministic view of the world	They reach ever-higher levels of achievement. All this gives them a greater sense of free will

People can be in between, or more on one or another side in certain areas of life. The mindset can vary from area to area like intelligence, artistic talent, or personality. However, whatever mindset people have, they will be guided in their chosen area by their individual mindset (Vermeer, 2012).

Benjamin Barber (cited by Dweck, 2008), said: “I don’t divide the world into the weak and the strong, or the success or failure; I divide the world into the learners and non-learners.” The growth mindset people believe that potential takes time to flower. If failure occurs, they will try to recover their self-esteem by finding someone who is worse off. People can be in a process of learning when they make mistakes. They are still hurt by failure, but failures never define them. Abilities can be expanded and there are many paths to success. Effort ignites ability and turns it into accomplishment (Dweck, 2008).

Mindset can be changed by knowing the two mindset paradigms. The growth mindset leads to new ways of thinking and reacting, taking challenges, learning from failure, and continuing with required effort. Changes can be achieved through teaching people about the growth mindset, or getting people to read science articles (Garofalo, 2016: V). People can become growth-minded thinkers, at least for a moment

(Dweck, 2008: 47). The next section looks at various research studies on how the growth mindset affects students' development and outcomes.

2.4.2 Related studies on growth mindset

There are many research studies on how the growth mindset impacts students' motivation, learning, and success. The findings show that the growth mindset of the students and teachers plays an important role in academic achievement (Auten, 2013; Cogdill, 2013; Fegley, 2010; Hansen, 2016; Willeke, 2015).

Cogdill (2013) studied the factors contributing to first-year college students' mindset of singing ability; the results showed that the students with a growth mindset regarding singing ability were more likely to have positive self-evaluations of their singing ability and willing to participate in future activities. Baldrige's research also found that the growth mindset increases "the belief in theory of intelligence, mastery goal orientation, performance approach goal orientation, and academic self-efficacy" (Baldrige, 2010: 153).

Blackwell, Trzesniewski, & Dweck (2007: 258) found that when middle school students with a growth-oriented mindset are placed in a challenging academic subject, such as mathematics, they tend to exert greater positive effort, have fewer reports of feeling helpless, focus on their personal learning goals, and face adverse learning situations more willingly than students with a fixed conception of intelligence or a fixed mindset. With greater significance, students who have a fixed mindset and are not taught that intelligence is malleable will tend to have grades that decline over the course of an academic year. However, students who are taught that intelligence is malleable and improves with effort put forth greater effort and show improvement in their mathematics grades.

Saia Katherine (2016: V) studied research on how a growth mindset will help students with challenging literacy activities. The students were evaluated by using a mindset survey and reading level test. The evaluation results were cross-checked by logic puzzles to match with the survey. The results of the research showed that there was a change in mindset and growth in reading abilities of students.

Overall, the growth mindset marks people to be excellent with the belief that intelligence can be developed. The growth mindset people embrace challenges, do not easily give up when faced with setbacks, put effort on a focus area, take criticism for development, and do not compare self to others. The growth mindset can be taught and developed. Students with a growth mindset can achieve more and show persistence in the face of setbacks in their work. The growth mindset leads to a desire to learn, and therefore a tendency to embrace challenges, persist in the face of setbacks, see effort as the path to mastery, learn from criticism, and find lessons and inspiration in the success of others. The growth mindset is not about being smarter but happier and resilient in approaching life's challenges with hard work and dedication. The next section will be on self-fulfilling prophecy theory which can also enhance student self-efficacy.

2.5 Self-Fulfilling Prophecy Theory

The self-fulfilling prophecy theory suggests that “any positive or negative expectations about circumstances, events, or people may affect a person's behavior toward them in a manner that causes those expectations to be fulfilled” (Business Dictionary, 2017). Robert Merton, the American sociologist, wrote, “If men define situations as real, they are real in their consequences”. The explanation of this saying is that men have assigned some meaning to a situation which leads to their behavior and consequences of those behaviors. There are many cases where predicted events

influenced behavior and led to unfavorable outcomes such as bankruptcies, scarcity of food and goods, pressures on the stock market, or even wars. The prophecy led to its own fulfillment. Individuals can create conditions where they fear negative events, and because they are convinced of the danger they act in a way which may lead to the feared outcome. The self-fulfilling prophecy, whereby “fears are translated into reality, operates only in the absence of deliberate institutional controls” (Merton, 1948: 210). Self-fulfilling prophecy is summed up as: “a false definition of the situation evoking a new behavior which makes the originally false conception come true.” (Merton, 1948: 194)

Self-fulfilling prophecy may not alter real events but personal perceptions and belief can influence everyday situations. The behavior of individuals and responses to others come from those beliefs. If people develop a positive mindset, they might influence others to perceive situations in a positive way. On the other hand, negative self-fulfilling prophecy may lead to lower self-esteem and cause people to become pessimistic toward the world. This view could lead to a vicious cycle in which negative mindset increase the self-fulfilling prophecy (Isaksen, 2012).

The placebo effect demonstrates the self-fulfilling prophecy in many studies and research relating to medication. Patients’ belief in treatment can enhance the immune system which makes a faster recovery despite the fact that the treatment never existed. Similarly, in classroom experiments where teachers were convinced that students had high potential, at the end of the year, teachers’ positive expectations lead to observed differences in performance. Students who reacted to the teacher’s low expectations may have suffered from anxiety when taking a test and this or related factors can degrade the test result (Bearman & Hedstrom, 2009: 294-313). In the study of McCane (2008)

on teachers' academic expectations and student outcomes, the results showed that teachers' expectations do contribute significantly to the prediction of academic performance of students (McCane, 2008: V).

Norris Haynes studied “the influence of the self-fulfilling prophecy on the academic achievement and self-concept of black marginal college students”. He gave the definition of self-fulfilling prophecy as “the situation in which students' academic performance is influenced by either what teachers are led to expect of them; by what the experimenter led them to expect of themselves; or by the interaction effect of both of these conditions”. In the study, he used self-expectancy to induce self-fulfilling prophecy; in turn, the findings showed that manipulating teacher-expectancy and student-expectancy may increase academic achievement (Haynes, 1978: 5, 173).

Another study by Marcella Heyward-Evans in the USA on ‘The impact of the self-fulfilling prophecy on student achievement in Title One schools’ indicates that there are significant relationships between students’ perceived teacher attitudes and English/language arts achievement. The findings are aligned with the study of Bamburg that teacher expectations play a significant role in determining students’ achievement and result in self-fulfilling prophecies (Heyward-Evans, 2003: 73; Bamburg, 1994: 2).

With higher expectations from teachers, students tend to perform high-quality work and turn out to meet teacher expectations (Jackson, 1998: iii). Rosenthal and Babad indicated that “The self-fulfilling prophecy is not confined to student academic performance but also applies to the workplace, therapy clinics, and even to athletics” (Rosenthal & Babad, 1985:36). In conclusion, the self-fulfilling prophecy affects desired outcome, meeting expectations, achievement, and the ability to choose activities to avoid negative effect.

2.6 Self-Efficacy Theory

Self-efficacy is defined as “beliefs in one’s capabilities to organize and execute the courses of action required to manage prospective situations. Efficacy beliefs influence how people think, feel, motivate themselves, and act. (Bandura, 1995: 2). Tella & Ayeni (2006: 3) defined self-efficacy as how people perceived their capabilities to achieve results and in return impact people’s higher achievement and social integration. The more self-efficacy people have, the more effort will be expended and be sustained in the face of setbacks. People with low self-efficacy lead to low self-esteem and associated to depression, anxiety and helplessness.

Self-efficacy is a highly effective predictor of students’ learning and motivation which can change students’ performance, and increase student interaction in learning and academic achievement. Students with high self-efficacy embrace challenges, work harder, persist in the face of setbacks longer, and have fewer negative emotion reactions. Students’ belief about their self-efficacy can also influence them by decreasing stress, anxiety, and depression (Zimmerman, 2000: 83).

The theoretical framework of self-efficacy (Figure 2.3) can allow people to predict behavioral changes. The efficacy expectation can be used as a mechanism of operation to successfully perform certain behaviors that lead to desired outcomes. They are differentiated from outcome expectations which are the estimate of the given behaviors that will lead to a certain outcome. The initiation and persistence of coping behaviors are affected by the expectations of personal mastery (Bandura, 1977: 193).

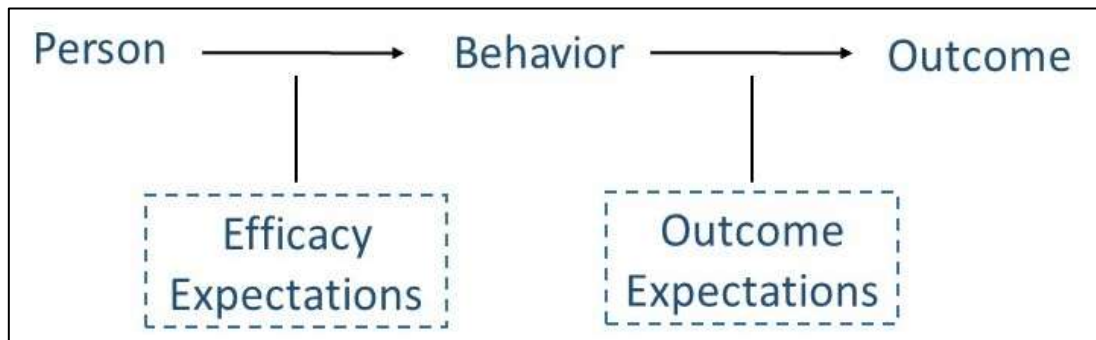


Figure 2.3 The difference between efficacy expectations and outcome expectations (Bandura, 1977)

Albert Bandura studied ‘Self-efficacy: Toward a unifying theory of behavior change’ which explained that specific psychological procedures can adjust the level and strength of self-efficacy. The results indicated that “The expectation of personal efficacy determines whether coping behavior will be initiated, how much effort will be expended, and how long it will be sustained in the face of obstacles and aversive experiences” (Bandura, 1977: 191).

There are four sources of efficacy expectations that influence the self-efficacy outcome. They are performance accomplishments, vicarious experience, verbal persuasion, and emotion arousal (Bandura & Wessels, 1994: 1) as shown in Figure 2.4.

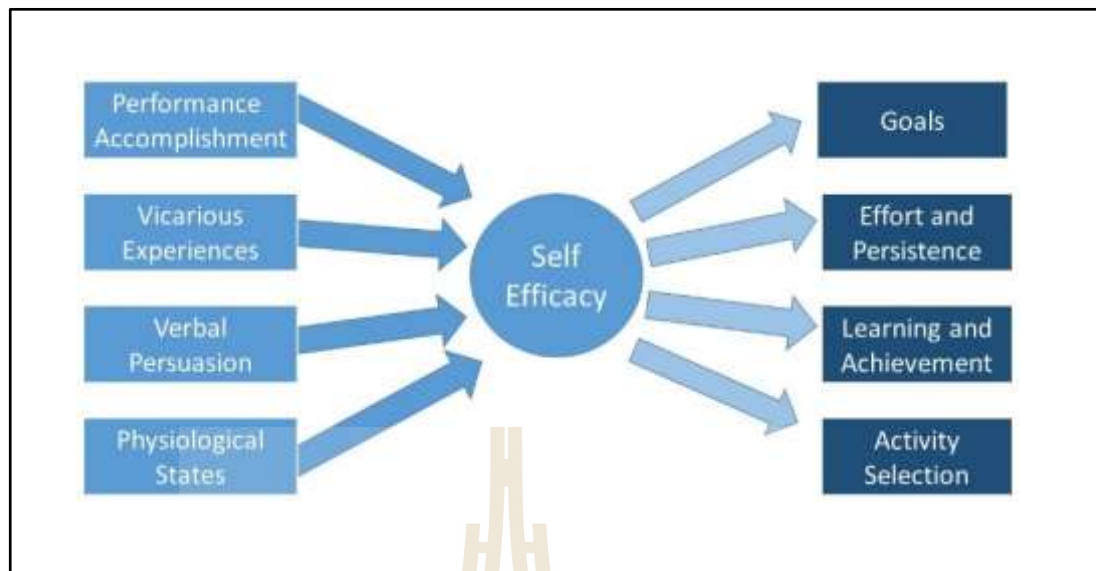


Figure 2.4 Four sources of influence of self-efficacy

(Bandura & Wessels, 1994: 1)

1) The performance accomplishment is influential through personal experiences of success or failure. The expectations would be higher through repeated success. The occasional failures are reduced by determined effort and can strengthen self-motivation in persisting in the face of setback. To build self-efficacy, people need behavioral and self-regulatory tools, cognitive, for creating and executing the actions to manage different situations. Bandura stated that: “A resilient sense of efficacy requires experience in overcoming obstacles through perseverant effort. This is the most powerful source in creating self-efficacy” (Bandura, 1977: 195; Bandura, 1995: 3-6).

2) Besides the performance path, people increase their self-efficacy through observing others’ behaviors and activities of social models, so-called vicarious experience. People feel persuaded if they see that others can do it. Perceived similarity of the model has a high level of effect on the observers; they are more persuaded by the model’s success or failure (Bandura, 1977: 197).

3) Verbal persuasion is the simple and easy means to use to influence behavior. To sustain any self-efficacy, persuasion can contribute to success through corrective performance. The credibility of the persuader is vital in ensuring the efficacy perception of the learners (Bandura, 1977: 198; Schunk & Pajares, 2009: 37).

4) The last source is emotion arousal which relates to states of anxiety or stress during a threatening situation (Bandura, 1977:199). This source can reduce people's stress reactions and change negative emotions and misinterpretations of physical states (Bandura & Wessels, 1994: 3). The presence of a self-efficacy belief is a predictor of improvement in academic performance and reduction in the anxiety of students (Zimmerman, 2000: 85).

These are sources that help to reduce defensive behaviors and can be a principle for intervention to create expectations (Bandura, 1977: 195). Increasing self-efficacy through four sources of information: performance accomplishments, vicarious experience, verbal persuasion, and emotion arousal resulted in better outcomes in terms of people's goals, effort and persistence, learning and achievement, and activity selection (Figure 2.5).

1) Goals - Self-efficacy is a vital influencer of people's behavior and of thinking changes so that on a task they feel confident, competent, and have the right incentives to take action (Schunk & Pajares, 2009: 37). The high self-efficacy people will set challenging goals and have a high commitment to achieve them. "The stronger the perceived self-efficacy, the higher the goal challenges people set for themselves, and the firmer is their commitment to them" (Bandura & Wessels, 1994: 3). Self-efficacy is proven to be a consistent predictor of students' outcome (Schunk & Pajares, 2009: 49).

2) Effort and persistence - Perceived self-efficacy and expectations influence people in getting involved in choices of setting and activities with sustained effort and perseverance in the face of obstacles and unfavorable experiences. People who have stronger perceived self-efficacy are more likely to select challenging tasks with high persistence to perform successfully (Bandura, 1977: 194; Schunk & Pajares, 2009: 48). These efficacy beliefs govern the motivating influence of outcome expectancies (Bandura 1995: 7). “Self-efficacy beliefs contribute to motivation in several ways: they determine the goals people set for themselves; how much effort they expend; how long they persevere in the face of difficulties; and their resilience to failures (Bandura & Wessels, 1994: 5).

3) Learning and achievement – Self-efficacy influences performance through expectations, people’s capabilities and prompt incentives (Bandura, 1977: 194; Schunk & Pajares, 2009: 38). The effectiveness of people affects ability to deal with different situations (Bandura, 1977: 193). Confronting obstacles and failures, strong efficacy people remain task-oriented and are able to get through the difficulties and control the threats. They use analytical thinking with a resilient sense of efficacy to attain performance accomplishments (Bandura 1995: 6; Bandura & Wessels, 1994: 5). This self-efficacy changes throughout people’s lifespan through learning (Schunk & Pajares, 2009: 37).

4) Activity selection - People act on their belief on their ability to do tasks, expected outcomes, and performance. Self-efficacy provides people the choices of activities and environment in which they would like to take part. People have different competencies, interests and social networks from the choices they make (Bandura & Wessels, 1994: 7). There is a proverb reflecting this process: “You cannot prevent the

birds of worry and care from flying over your head. But you can stop them from building a nest in your hair.” This is the way to eliminate the distress and anxiety which leads to avoidant behavior (Bandura 1995: 9).

Research has shown that self-efficacy can have an effect on people’s thoughts, feeling and actions. Self-efficacy is a more reliable and consistent predictor of educational outcome than other motivational variables (Schunk & Pajares, 2009: 49; Zimmerman, 2000: 82). “Self-efficacy has proven to be responsive to improvements in students’ methods of and predictive of achievement outcomes” (Zimmerman, 2000: 89).

Studies relating to self-efficacy (Table 2.2) have revealed that self-efficacy has effects on academic achievement and student learning. The self-efficacy is a combination of action, goals, values and personal standards (Cowan, 2006: 230) and directly affects the motivation which leads to enhanced learning outcomes (Sahile, 2014: 183). Also, the study of McWilliams shows that the self-belief system, which referred to self-efficacy, growth mindset, and a learning goal orientation of students, has an effect on the realization of goals and results in making changes to practices or programs (McWilliams, 2014: 88).

Table 2.2 Self-efficacy related studies

Researcher	Study	Findings
Ella M. Davis	An investigation of self-efficacy and achievement facilitation for undergraduate students	There was no difference in four social cognitive learning instructional methods when adjusted for academic achievement. However, the overall efficacy level and academic achievement gained significantly (Davis, 1999: 72).
Thomas J. Cowan	A conceptual analysis of Albert Bandura's account of self-efficacy and educational implications	Bandura's self-efficacy theory is a theory of human agency, in which humans' intentionality, causation and predictability figure prominently. 'Self-efficacy' is a major basis of action, along with goals, values, and personal standards. Bandura's early writings about self-efficacy seem to focus mainly on people's actions and behaviors, while his later work is broader in scope and includes a wide range of human experiences, such as emotions. Thus, people's emotions, if they are affected by their self-efficacy, can significantly influence their behavior and how they function in various aspects of

Table 2.2 Self-efficacy related studies (Continued)

Researcher	Study	Findings
		their personal, educational, and/or professional lives (Cowan, 2006: 230).
Elizabeth Claire McWilliams	Self-efficacy, implicit theory of intelligence, goal orientation and the ninth grade experience	One of the responsibilities of schools is to prepare the nation's children for postsecondary education and to become life-long learners – it is one of the tenets of most high schools' mission statement. In order to realize this goal, school districts must learn what the self-beliefs of their students and teachers are and make changes to practices and programs that are going to support each student's and teacher's progress toward a growth mindset with strong self-efficacy beliefs, and who approach teaching and learning from a learning goal orientation. The emphasis on the high stakes test must shift and instead be on the process and opportunities for learning (McWilliams, 2014: 88).

Table 2.2 Self-efficacy related studies (Continued)

Researcher	Study	Findings
Kathryn Deeanne Will-Dubyak	Pre-service teacher efficacy development within clinically-based practice: Examining the structures and strategies in the collaborative cohort	The findings suggest that (a) school communities matter as “a context for preservice teacher efficacy development, (b) purposeful, aligned, situated learning experiences which bridge course and field work contribute to efficacy development, and (c) a mindset of continual professional growth within practice develops confidence” (Will-Dubyak, 2016: X).
Mustafa Meral, Esma Colak, Ertan Zereyak	The relationship between self-efficacy and academic performance	Self-efficacy plays” an important variable on students’ academic performance and achievement positively” (Meral, Colak, & Zereyak 2012: 1145)
Shahrzad Elahi Motlagh, Kourosh Amrai, Mohammad Javad Yazdani,	The relationship between self-efficacy and academic achievement in high school students	Analysis of data revealed that “self-evaluation, self-directing and self-regulation are correlated with academic achievement. According to the results, self-efficacy is a considerable factor in academic achievement” (Motlagh et al., 2011: 765).

Table 2.2 Self-efficacy related studies (Continued)

Researcher	Study	Findings
Haitham Altaib Abderahim, Hossein Souri		
Amare Sahile	The effect of self-efficacy and motivational orientations on academic achievement of freshmen science students	Regression results demonstrated that “self-efficacy, intrinsic (i.e. IM-to know and IM-task accomplishment) and extrinsic (i.e. identified regulation) forms of motivational orientations had statistically significant direct effects on academic achievement. Students’ judgments of their capability in academic tasks and their autonomous motivational orientations lead to enhanced learning outcomes. Therefore, science instructors and program managers need to devise interventions to uplift and capacitate students’ capability and internalization of learning” (Sahile, 2014: 176). Education needs to promote self-efficacy and internalized motivation as a priority. Students should be provided with the intervention with the aim of internalizing the value of education and achievement to

Table 2.2 Self-efficacy related studies (Continued)

Researcher	Study	Findings
		help students to cope with problems of social adaptations to the new environment (Sahile, 2014: 183).

In conclusion, enhancing the self-efficacy of students will lead to desirable learning outcomes. The four sources of influence of self-efficacy – performance accomplishment, vicarious experiences, verbal persuasion, and emotion arousal – contribute to learning outcomes. Students with perceived self-efficacy can achieve challenging goals, keep up their effort and perseverance, learn and achieve over obstacles, and know how to select activity to get involved in. With more self-efficacy, the more motivation students have, which results in enhancing their learning.

After thoroughly reviewing the Cooperative Education principle, the based theory was the experiential learning which students can developed through various methods such as clinical duties, teaching and learning evaluation, presentations, group discussions, peer assessment, teamwork, work experiments, problem solving tasks, independent work projects, and work reflection reports. Those methods are similar to the mentioned four sources of influence of self-efficacy: learning from own experiences, observations on others, feedback, and emotion arousal. With the belief that the self-efficacy obviously effected students' academic achievement, this study tended to find the way to enhance students' self-efficacy through their Cooperative Education. From the review of mindset and self-fulfilling prophecy, both have effects on certain groups of outcomes which somehow align with the self-efficacy outcomes. The observation brings to mind the question of whether growth mindset and self-fulfilling

prophecy can enhance students' self-efficacy or not. There is a call for a study to prove whether or how growth mindset and self-fulfilling prophecy can enhance students' self-efficacy and learning. The relationship of growth mindset and self-efficacy and self-fulfilling prophecy and self-efficacy are as follows.

All in all, self-efficacy is the vital part of thinking and behavioral changes. It is proven to predict student learning outcomes. The five effects of growth mindset include: (1) Embrace challenges, (2) Persist in the face of setbacks, (3) See effort as the path to mastery, (4) Learn from criticism, and (5) Find lessons and inspiration in the success of others. Together with the effect of self-fulfilling prophecy on (1) Desired outcome, (2) Meet expectations, (3) Achievement, and (4) Awareness to avoid negative action, both growth mindset and self-fulfilling prophecy are able to promote the self-efficacy of students. These effects mirror the four areas of self-efficacy influences, which are: (1) Goals, (2) Effort and persistence, (3) Learning and achievement, and (4) Activity selection. The resemblance of these two models is promisingly matched in Figure 2.5 and Figure 2.6. As a result, a successful growth mindset and self-fulfilling prophecy development may predict and lead to the outcome of self-efficacy.

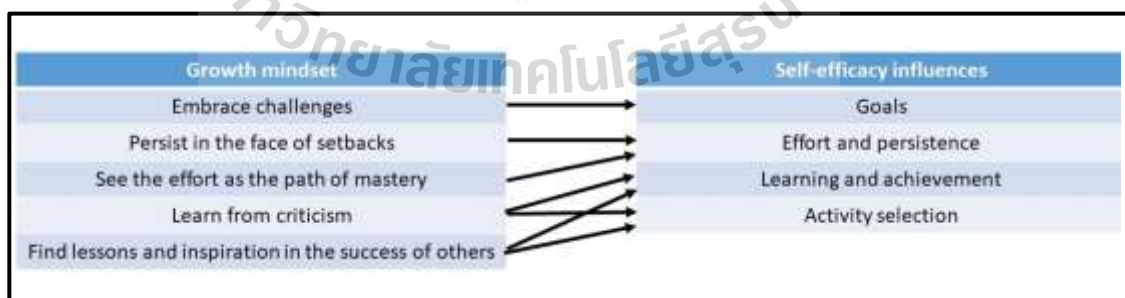


Figure 2.5 The relationship of growth mindset effects and self-efficacy influences

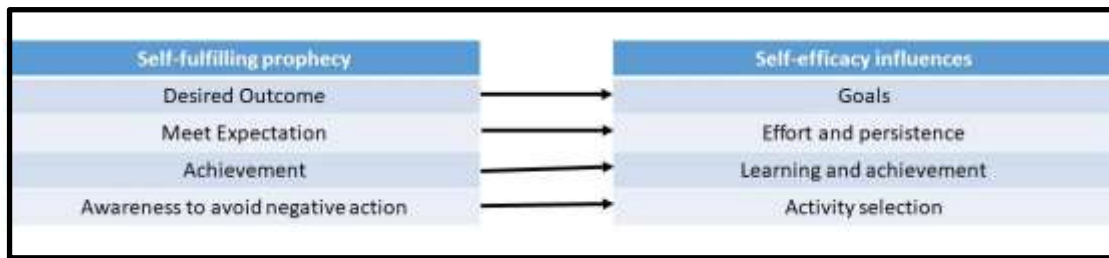


Figure 2.6 The relationship of self-fulfilling prophecy effects and self-efficacy influences

Therefore, there is a call for a study to explore the growth mindset and self-fulfilling prophecy development to enhance student self-efficacy and learning.

2.7 Intervention

The intervention is designed based on authentic learning where students are encouraged to get involved in and become accountable for their own learning. Active learning is a suitable means of intervention. It allows students to initiate and engage in their critical thinking and application through peer assessment and self-reflection. Active learning cannot be forced upon anyone; so students must be willing to learn and ready to take initiative (Desta et al., 2009: 73). The active learning process involves both experience and dialogue; observing, doing, dialogue with self and others. To elaborate, the observing is through watching or listening to others, either in real action or through stories or movies on the related phenomena. Doing refers to learning through actual action or in an indirect way such as role play, simulation, case study. There can be dialogue with others, interaction with others, with practitioners and experts, either inside or outside the classroom. This also can be done through one-on-one, group discussions, online journals, and social media. Dialogue with self happens when students think reflectively on the topic. They can keep the reflection with a reflective journal which allows students to think back on their own experience, own thinking, own

feeling, and address the useful questions (Fink, 1999: 2-3).

The intervention which integrates with various methods is called 'blended learning'. The blended learning refers to the hybrid, mixed, and integrative learning methods. The methods combine the traditional way of classroom training together with online materials, independent study, and group discussion. There is no fixed integrated methods (Mindflash, 2017). Pappas (2015) outlined the benefits of blended learning which are: provide personalized training experiences in which learners get engaged in their personal goals and learning and track learner performance and skill development through online discussion and be able to modify the activities they participate in. In addition, the 70-20-10 learning model, developed by Morgan McCall, Michael Lombardo, and Robert Eichinger defined that the effective learning occurred when people performed on the job or work counted 70%, while 20% was from learning from others like coaching, peer learning, group discussion, and 10% was from self-learning (McCall et al., 2019). So, in this study, the intervention was designed based on the active learning, blended learning, and 70-20-10 learning model to ensure Co-op students' learning outcome.

2.7.1 Growth mindset intervention studies

Growth mindset intervention can improve students' motivation and self-efficacy (Rhew, 2016). It can be developed through various paths of intervention. Table 2.3 shows the studies of various growth mindset intervention.

Table 2.3 Studies of growth mindset intervention

Study	Intervention	Result
Helping educators foster a growth mindset in community college classrooms	Theory of mindset Site visit once a week Brainology® ⁴ online program E-journal	Brainology® had a statistically significant effect on the motivation for reading. Educators should consider emphasizing a curriculum that incorporates a growth-mindset model of instruction that focuses on persevering, utilizing constructive feedback to improve, and accentuating the flexibility of intelligence. The mindset of the student and the teacher play an important role in academic success” (Auten, 2013).
Cultivating a growth mindset in students at a high-achieving high school	Transition program of growth mindset Counseling department Naviance -online program	EPP proposed a plan to help a large number of students at HMHS develop a growth mindset. The plan builds upon the cultural expectations of the school for high academic achievement for all students. First,

⁴ Brainology® is “a blended learning curriculum that teaches students how to develop a growth mindset. The program includes online animated instructional units, as well as offline classroom activities”. Brainology® is a fun, interactive program. “Students learn about how the brain functions and learns, along with healthy habits, study techniques, self-regulation strategies, and other essential non-cognitive skills that help them to become effective learners” (Mindsetworks, 2018).

Table 2.3 Studies of growth mindset intervention (Continued)

Study	Intervention	Result
Brainology® online program Peer leader program	the author will support the administration of HMHS by empowering them to lead the implementation of the plan. Second, the author will communicate with the parents and community about the importance and benefits of developing a growth mindset in students and greater student achievement (Fegley, 2010).	
Teaching the character competencies of growth mindset and grit to increase student motivation in the classroom	Workshop-unit approach Qualitative journal keeping MSLQ	“Teacher growth mindset means showed statistical significance and a moderate to large effect size, but not true for student growth mindset means and student or teacher data for grit or motivation. No causal relationship between growth mindset and motivation, or grit and motivation, but the effect of grit was much greater than the effect of growth mindset on motivation” (Garofalo, 2016).

Table 2.3 Studies of growth mindset intervention (Continued)

Study	Intervention	Result
<p>The effects of a growth mindset intervention on the beliefs about intelligence, effort beliefs, achievement goal orientations, and academic self-efficacy of LD students with reading difficulties</p>	<p>Class discussion Student interview Journal responses Unit quiz through theme and coding Brainology® online program MSLQ</p>	<p>“Student survey answers did not reveal a strong pattern of positive motivational change after the intervention. Slight post-test group mean increases were noted in theory of intelligence, mastery goal orientation, performance approach goal orientation, and academic self-efficacy. Qualitative analysis verified students' absorption of the concept that the brain changes with learning and that learning increases intelligence through brain plasticity” (Baldrige, 2010).</p>
<p>The effects of a growth mindset intervention on self-efficacy and motivation of adolescent special education students</p>	<p>Brainology® online program Mentoring Pen pals Workshop</p>	<p>Results suggested that “a growth mindset intervention had a significant difference in motivation of adolescent special education student” (Rhew, 2016)</p>

Table 2.3 Studies of growth mindset intervention (Continued)

Study	Intervention	Result
Efficacy of a growth mindset intervention to increase student achievement	Brainology® online program Focus group	This study found “no significant changes in students’ mindsets, effort beliefs, academic self-efficacy, and use of study skills strategies for learning. Results showed that the full implementation treatment group showed a positive increase in science engagement and motivation. All students showed significant changes in science quarter grades over the course of this study. The survey pre and post data and the focus-group dialogue with students and teachers were analyzed and summarized to obtain insight as to the overall impact of the intervention on participants” (Wilkins, 2014).

There is limited past research globally involving growth mindset and self-fulfilling prophecy intervention for Co-op students. This study aims to develop intervention for growth mindset and self-fulfilling prophecy to enhance Co-op students’ self-efficacy. From the studies of intervention above, the online program Brainology®, the journal writing, and dialogue or discussion, significant change was seen in students’

growth mindset. With the journal writing and dialogue, students got chances to reflect on themselves which in turn led to their own learnings.

2.7.2 Reflection

Reflection is one step in experiential learning; different reflective observation is made by students who reflect on their action and then are able to express their own thoughts, feelings, and opinions. There are various practices in reflection. One of the most effective and popular ones is reflection through writing, what we may know as a reflective journal, learning journal, reflective writing, or journal log. Writing plays an effective role in learning. Students examine what they have done more and the thought is better organized and sharper in the interpretation and argument when they write about their observations, actions, and learning. Writing also helps students to identify the knowledge gap so that they can learn and develop learning (Glynn & Muth, 1994:1065). Baker & McLoughlin, Dixon, and Florio & Clark (cited by Araceli Ruiz-Primo, 2004: 62) argue that writing is a way of enjoying expression, finding own meaning and involving in their learning and represents a useful resource for teachers to understand their students and provide prompt feedback. Ruiz-Primo has defined a journal as: “a compilation of entries (or items in a log) that provide a record, at least partially, of the instructional experiences a student had in her or his classroom for a certain period of time. The reflective journal is a learner’s response to experiences, situations, opinion, information, thoughts, and feelings. It is the way to explore new learning and opportunity to perceive self-knowledge. It also develops “the connections between what people already know and what they are learning, theory and practice, and what they are doing and how and why they do it” (UNSW, 2014: 1).

The research has shown that the use of a reflective journal to summarize what learners learn and think will help learners to resolve problems. This tool can be used for self-reflection, using such approaches as the expression of ideas through either written and visual or graphic representations, observing and analyzing, the opportunity for students to question and explore the answers, and lastly, to help students in time management skills (Fingon & Fingon, 2008: 41; Gibbs, 1988: 98). Reflective journals can be used as a learning and assessment procedure to track students' growth and development. Students thus have the opportunities to demonstrate their learning through certain criteria in the journals (Woodward, 1998: 415; Alderman & Milne, 2005: viii). This also provides opportunities for learners to look back on their experiences periodically and find out what they are learning so they can apply new knowledge to future situations and make goals and action plans to develop their behaviors (Costa & Kallick, 2000: 60). Teachers can build students' interest and measure students' performance and motivation to learn through reflective journals (Fingon & Fingon, 2008: 45; Ruiz-Primo & Li, 2004: 61).

There are various research studies on reflective journals; for instance, Alshuler's (2012) study, where he found that a reflective journal is a tool that can help students learn to adapt to changing environments. Another study by Toni RinconGallardo revealed that the use of a reflective journal positively influenced metacognition development and can be used as an effective learning method in the classroom (RinconGallado, 2009: 62). It helps to foster independent learners in taking control and engaging in effective learning processes (Owens 2001: 32).

Even though the reflective journal is one of the most popular reflective tools, it was reported that the evidence for the inadequate and controversial of the

relevance and long-term impact of reflective writing. (Graham & Phelps, 2003; Mann et al., 2009 cited by Tsang, 2011: 2). Most evidence also showed that the quality of the reflective journal was poor and indicated the lack critical reflection and transformative engagement. Most students found that the reflective writing was difficult and time consuming (Mann et al., 2009; Dymant & O'Connell, 2010 cited by Tsang, 2011). Tsang (2011: 16-17) .studied the reflective group discussion and found that it was beneficial for student learning by using reflective group discussion as the complementary to the reflective writing. Students' perceived benefits from peer learning, tutor support, and multi-perspective of critical thinking. Group discussion also provided "collaborative multi-perspective learning and professional development through a supportive "community of practice" engaging in critical dialogue. By engaging in critical reflective dialogue, students and supervisors become collaborators in reflective interrogation, imaginative speculation, perspective transformation and in the creation of the kind of knowledge that empowers change within themselves and their social domains"

In summary, the daily reflective journal can help students to learn and to engage successfully in learning. The reflective journal allows students to reflect themselves, to know their goals and values. When a situation happens in the future, they can apply the knowledge gained from previous situations and make better experiences. The online group discussion provided students the community learning, and the engaging critical dialogue to change within themselves and their society. Therefore, in the study, intervention considered to include the complementary of both online reflective journal and online group discussion.

2.8 Research Conceptual Framework

From previous literature review, there were relationship between growth mindset and self-efficacy and self-fulfilling prophecy and self-efficacy. The effect of growth mindset and self-fulfilling prophecy are able to promote the self-efficacy. Therefore, the study is aimed at exploring growth mindset and self-fulfilling prophecy intervention to enhance Co-op students' self-efficacy. The following is the research conceptual framework. (Figure 2.7)

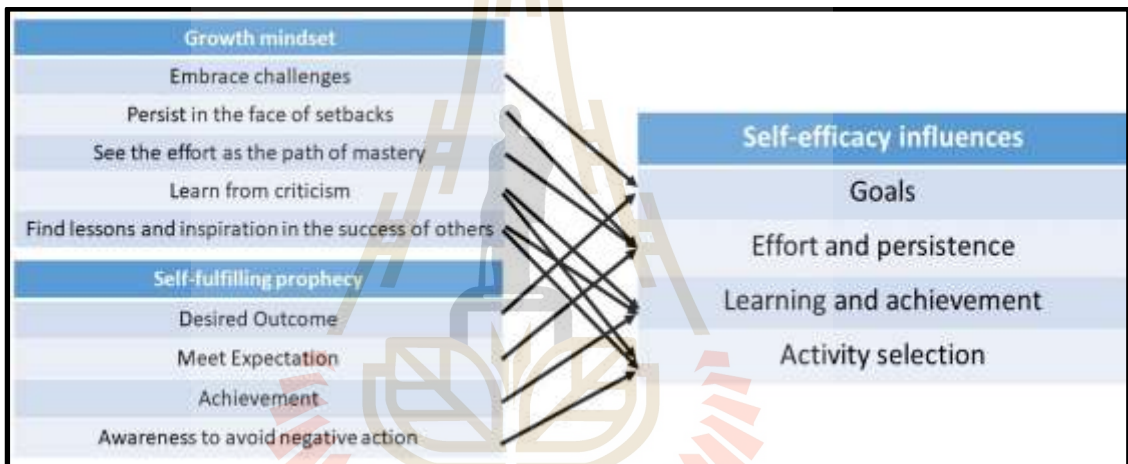


Figure 2.7 Research conceptual framework

CHAPTER 3

RESEARCH METHODOLOGY

This chapter presents the research methodology which included research design, research samples, research setting, research instruments, data collection, data analysis, and the ethics in human research.

3.1 Research Design

This study adopted the mixed methods research with experimental research design which involves manipulation of independent variables to investigate the effect of the growth mindset and self-fulfilling prophecy intervention on Cooperative Education students' self-efficacy. The mixed method research integrated the strength of both qualitative and quantitative methods in data collection and data analysis to answer the research questions. The integration of both methods helps the study findings be more justifiable and complete than using quantitative or qualitative alone (Clark & Ivankova, 2016: 5). The mixed method is used to support the limitation of the insufficiency of single source data (Creswell & Clark, 2011: 8-16). In this study, the embedded experiment design is used to support the research findings.

An experimental research design is used to investigate the effect of an independent variable on a dependent variable. However, in this study, due to the lack of randomization of samples, the quasi-experimental-the nonrandomized control group design is used. The quasi-experimental research is research that similar to experimental research but is not true experimental research due to the participants are not randomly assigned to the manipulation (Cook & Campbell, 1979). For internal validity, the quasi-

experimental is somewhere between correlational studies and true experiments. The quasi-experimental research is used in the setting which random is difficult and normally conducted to investigate the effective of the treatment (Price, et al., 2015). In this study, the quasi-experimental-the nonrandomized control group design was conducted as shown in Figure 3.1. The dependent variables are observed in both the experimental and control groups before the intervention. Then, the experimental group is under intervention and the post-test will be conducted on both groups to assess the effect of intervention on the experimental group. The quasi-experimental methods are used because it is more practical and feasible in a real-world setting (Patidar, 2013: 2).

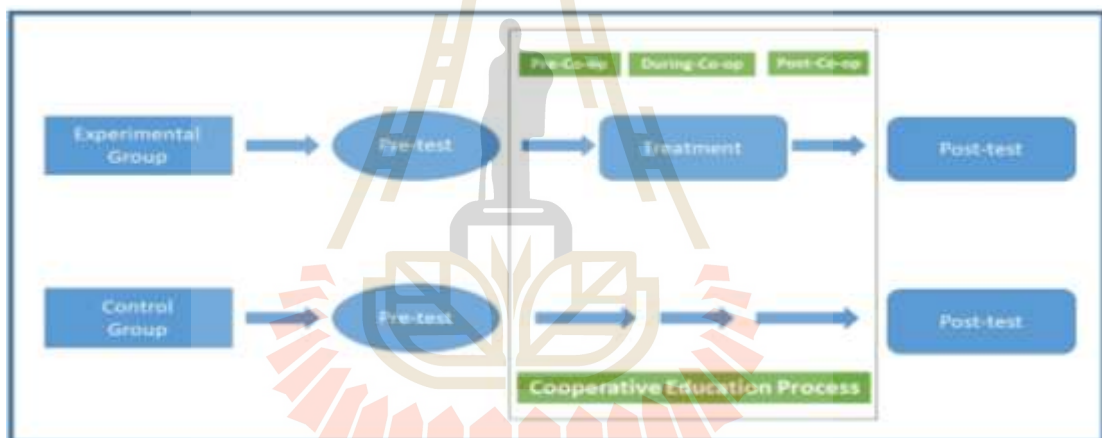


Figure 3.1 The quasi-experimental-the nonrandomized control group design

In the present study, data collection of both quantitative and qualitative will be conducted to answer the research questions. The first set of quantitative data used pre-test and post-test design for both control and experimental groups to investigate the effect of a growth mindset and self-fulfilling prophecy intervention on Co-op students' self-efficacy. The second qualitative data was collected during the intervention through Co-op students' online reflective journals, online group discussions, and individual interview sessions to examine the effect of the intervention toward Co-op students' self-

efficacy. The overall research process is illustrated in Figure 3.2.

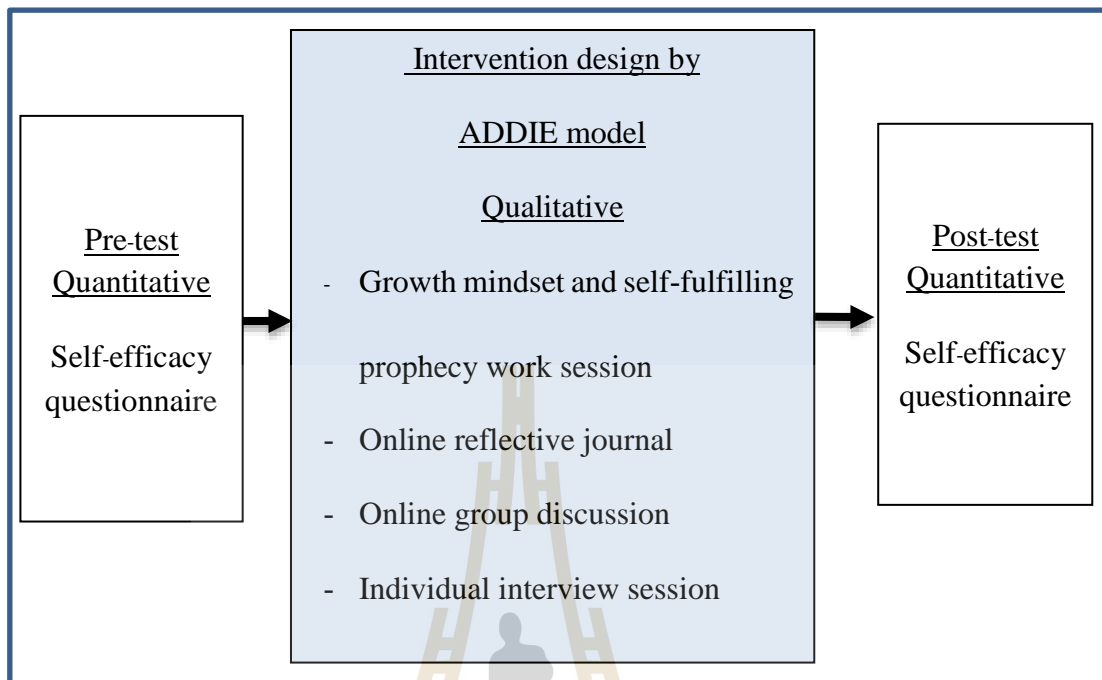


Figure 3.2 Research process

In this study, there were two groups of participants, the control group and the experimental group. The control group participated only in the pre-test and post-test of self-efficacy questionnaire. The experimental group participated in the pre-test and post-test of self-efficacy questionnaire, the growth mindset and self-fulfilling prophecy work session, the online reflective journal, the online group discussion and the individual interview session. This design will enable the researcher to see the result of the intervention comparing the pre-test score at the beginning of the intervention with the post-test score after intervention in the experimental group. The comparison scores were also applied between the control and experimental groups.

The independent variables in this study are the growth mindset and self-fulfilling prophecy, which were purposefully developed in this study. The dependent variables are Co-op students' self-efficacy. The qualitative data to support the

dependent variables are collected through online reflective journals, online group discussions and individual interview sessions.

In summary, this study used the mixed method embedded with the quasi-experimental research design. The data collection is from both quantitative and qualitative data through the pre-test and post-test self-efficacy questionnaire, the online reflective journal, the online group discussion and the individual interview session. The two groups of control and experimental, non-randomization, were conducted to compare the dependent variable score.

3.2 Research Setting

This study was conducted at *Kasetsart University, Sakon Nakhon campus*, Thailand. There are three faculties offered at this campus, namely the faculty of Natural Resources and Agro Industry, the faculty of Liberal Arts and Management Science, and the faculty of Science and Engineering. The university provides the Cooperative Education as a selective course. Co-op students could register for the course, which is offered for 16 weeks of Cooperative Education in the workplace. It is compulsory for registered Co-op students to enroll in the Cooperative Education Preparation course one semester prior to the start of Cooperative Education in the workplace. The course syllabus of the Cooperative Education Preparatory program included the topics of (1) Cooperative Education philosophy and process, (2) Project writing and presentation, (3) Personality and social etiquette development, (4) Academic readiness, (5) Presentation skill, (6) Desired graduate qualities, and (7) Workplace selection.

During the Cooperative Education, Co-op students were visited by a professor at least once to update the project progress, and met the workplace mentor of Co-op students. The reflection session through project presentation will be done by Co-op

students after the end of the Cooperative Education period. The Cooperative Education took approximately 16 weeks depending on workplace convenience.

3.3 Research Samples

The population of this study consists of Co-op students from *Kasetsart University, Sakon Nakhon campus*, Thailand who enrolled in the Cooperative Education course in the first semester of the 2019 academic year. The total population is 107 Co-op students from all faculties in this campus which are the faculty of Natural Resources and Agro Industry, the faculty of Liberal Arts and Management Science, and the faculty of Science and Engineering. According to Roscoe 1975 (cited by Shinawatra U., 2017), “In most experimental research, sample sizes of 30 or more are recommended. In this study, initially recruited were 40 samples of the experiment group and 40 for the control group to back up withdrawal of Co-op students. As this study was the quasi-experimental research, the samples were not randomly designed. The participants were voluntary joined the control group and experimental group. Availability sampling, a non-probability sampling method, was used to get the samples.

The sampling process started with the researcher coordinated with the faculty staffs to hold the kick-off session one month prior to the working start date. The 30-minute kick-off session started with the introduction of research intervention details, then the researcher asked for the volunteered Co-op students to attend the research intervention. There were 72 Co-op students who volunteered to participate in this study (36 students as a control group and another 36 students as an experimental group). The distribution of the samples of the experimental group is as Table 3.1.

Table 3.1 The demographics of experimental group

Faculty of	Male	Female	Total
Natural Resources and Agro Industry	3	12	15
Science and Engineering	3	12	15
Liberal Arts and Management Science	4	6	10
Total	10	30	40

Prior to participation in the intervention process, a formal consent form was distributed to the Co-op students of both the experimental group and the control group, respectively. The consent form was explicit that their participation was entirely voluntary and that they could withdraw from this study at any time. Details of the consent form will be explained more in the ethics in human research section.

3.4 Co-op students' Intervention Attendance

The intervention was designed for Co-op students to participate in various activities, the growth mindset and self-fulfilling prophecy work session, the online reflective journal, the online group discussion, and the individual interview session. The 8-hour growth mindset and self-fulfilling prophecy work session was conducted on December 8, 2018. One month later, Co-op students started to record the online journal at least once a week, for a total of 14 weeks. The online group discussion was conducted biweekly, for a total of seven times. Even though the number of each of the activities was defined, by the 13th week the data from the online reflective journal and the online group discussion reached saturation, which means the researcher hears familiar answers to questions. The responses are mostly repetitive.

At the end of the intervention period, four Co-op students were withdrawn from

the data collection, due to less than 50% participation in the online reflective journal and the online group discussion being considered invalid samples. There were two Co-op students who had participation of less than 50% due to the limitation of connection in Laos. Another two declared themselves to withdraw from the study due to sickness and a personal issue, respectively. There were 36 consequences to the final number of participating Co-op students of the experimental group in this study. The analyzed data is from the distribution of Co-op students as shown in Table 3.2.

Table 3.2 The distribution of Co-op students by faculty

Faculty of	Male	Female	Out	Total
Natural Resources and Agro Industry	1	12	2	13
Science and Engineering	2	12	1	14
Liberal Arts and Management Science	3	6	1	9
Total	6	30	4	36

3.5 Research Instruments

This section provides details of the two main topics that are the research instruments, which are the pre-test and post-test self-efficacy questionnaire and the intervention instruments.

3.5.1 Self-efficacy questionnaire

The quantitative self-efficacy questionnaire has been developed based on the eight-question growth mindset (Dweck, 2006: 12-13) and the constructs of independent variables shown in the research framework. The questionnaire was divided into two parts; the first part was the demographic data on faculty, and the second part was the self-efficacy questions.

To test the validity of the questionnaires, three self-efficacy related content experts were asked to rate whether they thought that each question related to the independent and dependent variables. They were asked to rate the score based on the Index of Item-Objective Congruence (IOC) proposed by Rovinelli and Hambleton (1977). The validation form included a three-rating scale: rating 1 (congruence), 0 (questionable/unclear), and -1 (incongruence). The IOC of each item was calculated for mean score. The items with the mean between 0.5 – 1 were considered to be valid, whereas the mean of less than 0.5 was considered invalid and needed to be revised. The three experts unanimously rated with the mean between 0.5 – 1. The additional suggestions were to eliminate the duplicated wording used in the questions.

3.5.2 Intervention instruments

Intervention instruments involve (1) Growth mindset and Self-fulfilling prophecy work session, (2) Online reflective journal, (3) Online group discussion, and (4) Individual interview session. The instruments were developed to align with the theoretical framework to enhance the independent variables to effect the dependent variables. The intervention process is shown in Figure 3.3.

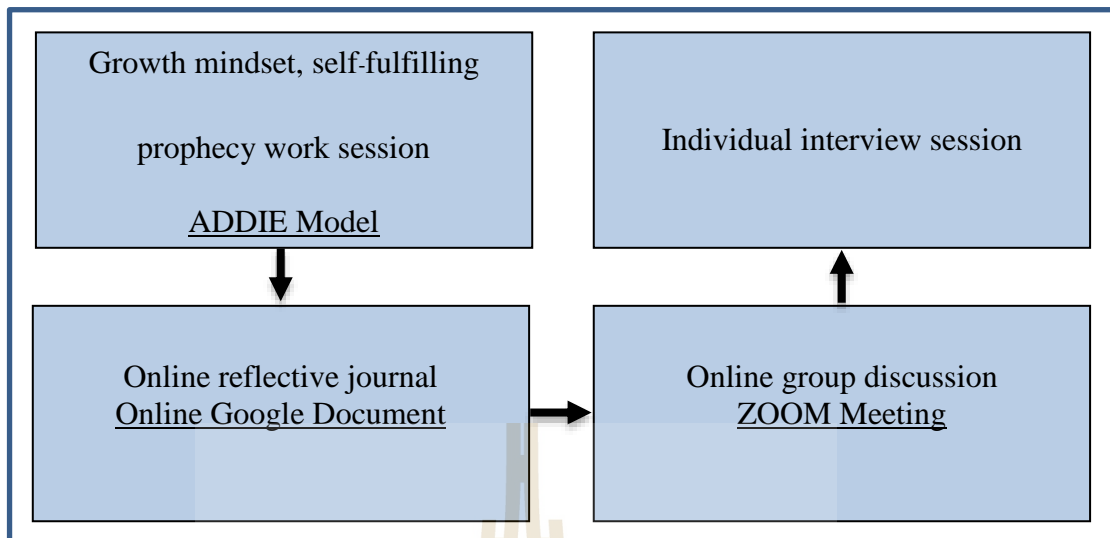


Figure 3.3 The intervention process

3.5.2.1 Development of growth mindset and self-fulfilling prophecy work session

The development of the work session is to help Co-op students to have concepts of growth mindset and self-fulfilling prophecy that can be used to enhance their self-efficacy. In this study, the instructional system was used to develop the work session according to the framework to enhance the Co-op students' self-efficacy.

An instructional system is defined as “an arrangement of resources and procedures used to promote learning” (Gagne et al., 1992: 20). They also added that the instructional system approach is: “a process of planning and developing instruction that makes use of research and learning theory and employs empirical testing as a means for the improvement of instruction”. The objective is to help students develop systematic learning with rigid measurement. One of the most well-known models of instructional systems is the ADDIE model.

The ADDIE model is a systematic approach to instructional systems development (ISD). ADDIE refers to “the major processes that comprise the generic ISD process: analysis, design, development, implementation, and evaluation. These processes are considered to be not only sequential but also interactive when used” (Molenda, 2003: 34-36). The ADDIE model is shown in Figure 3.4.

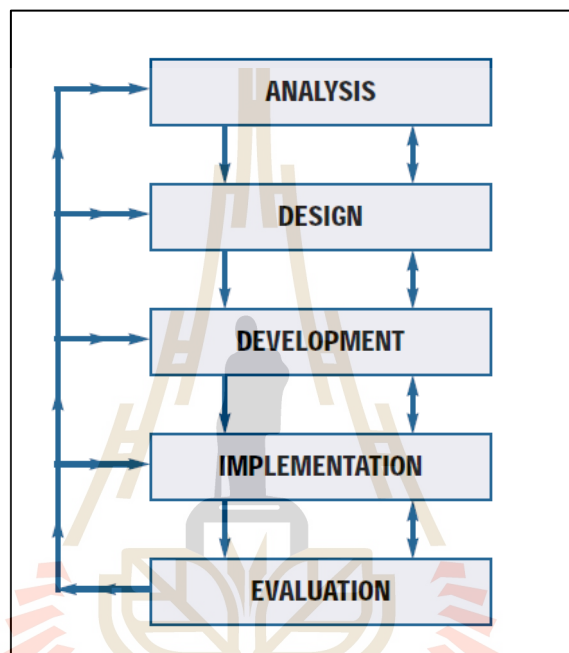


Figure 3.4 ADDIE model (Grafinger, 1988)

All five of these steps can be revisited back and forth according to the additional information received. The new learning process can be adjusted to meet learning objectives.

The ADDIE model illustrates: “the interconnections between the development of instructional interventions and the development of performance improvement interventions” (Molenda, 2003:35). So, the researcher has chosen the ADDIE model as the method to design the intervention since it is both instructionally

sound and measurable. In this study, all intervention is in Thai. The following are the details in each step.

1) Analysis - The analysis step is to identify what are the key learning needs in the process by addressing problems: how to solve problems, which skills and knowledge are required by learners, and what are the contents required. The needs analysis can be done through interviewing the related persons. The design should be suited to learners' learning capabilities. The analysis consists of three parts: (1) Instructional goal, (2) Learner analysis, and (3) Instructional analysis (Molenda, 2003). The next section elaborated on the details of each part.

(1) Instructional goal - The Instructional goal of this study was to develop the work session that provides concepts of growth mindset and self-fulfilling prophecy so that students can understand and apply the learnings into their working experience. The learning objectives of this intervention are that students be able to explain the concepts of growth mindset and self-fulfilling prophecy, apply the learning, and demonstrate the growth mindset behaviors.

(2) Learner analysis - The learners were the Cooperative Education students (Co-op students) who were enrolled in the Cooperative Education course. They were required to take the Cooperative Education Preparatory course one semester prior to their Cooperative Education period. Since most Co-op students are millennials who have grown up with the internet and technology, they demand speed and customization in their learnings. They preferred that the learning method would be online so that they could access anywhere, anytime. They also need to get actively involved in the learning process through real-world situations, and learn and apply their experiences in the new settings. (Miller, 2001:12).

(3) Instructional analysis - This part presents the component in analysis of the content involving the work session. From literature review in Chapter 2, the researcher used Brainology® to be the base to develop the growth mindset and self-fulfilling prophecy of Cooperative Education students. Brainology® is a program of blended learning curriculum to develop students' growth mindset. This program is based on research by leading experts in the area of motivation, Carol S. Dweck, Ph.D., and Lisa Sorich Blackwell, Ph.D. Brainology® teaches students the powerful combination of the learning brain session and effective study skill. The applied Brainology® focused on the goals which are to sustain, reinforce, and deepen students' growth mindsets and help to develop metacognition (Mindsetworks, 2017:3-12). There are five strands that spiral throughout the program: (1) Growth mindset, (2) Goal setting, (3) Emotion, Stress & Learning, (4) Effective Effort, and (5) Learning Strategies (Mindsetwork, 2018:5). Consequently, in this research, the contents were based on the contents of Brainology® and instructed variables in this study created the series of activities to ensure the continuous learning of students. The duration of the work session will be one day (8 hours). This work session was conducted one month prior to the start of the Cooperative Education. The details of instructional analysis were the cluster analysis, task inventory, and task knowledge.

a. Cluster analysis - Cluster analysis is the step to define the main topics of the contents. In this study, there were four main topics, which are (1) Brain, (2) Mindset, (3) Self-fulfilling prophecy, and (4) Reflective journal. The cluster analysis is illustrated in Appendix 3.1. The example of cluster analysis is shown in Figure 3.5.

1. สมอง (Brain)
1.1 การทำงานของสมอง
1.2 การเติบโตของสมอง
2. กรอบความคิด (Mindset)
2.1 ความหมายของกรอบความคิด
2.2 ประเภทของกรอบความคิด
2.3 ผลกระทบ การพัฒนา และเคล็ดลับการเรียนรู้ของกรอบความคิดแบบเติบโต
2.4 ความเครียดกับการเรียนรู้
2.5 การประยุกต์ใช้กรอบความคิดแบบเติบโตในสหกิจศึกษา
3. การคาดการณ์ของตนเองที่ส่งผลให้เกิดขึ้นจริง (Self-fulfilling prophecy)
3.1 ความหมายและความสำคัญของการคาดการณ์ของตนเองที่ส่งผลให้เกิดขึ้นจริง
3.2 ผลและตัวอย่างของการคาดการณ์ของตนเองที่ส่งผลให้เกิดขึ้นจริง
3.3 ผลของการคาดการณ์ของตนเองที่ส่งผลให้เกิดขึ้นจริง ของนักศึกษาสหกิจศึกษา
4 การบันทึกสะท้อนการเรียนรู้ (Reflective journal)
4.1 ความหมาย ความสำคัญ และประโยชน์ของการบันทึกสะท้อนการเรียนรู้
4.2 ขั้นตอนในการบันทึกสะท้อนการเรียนรู้
4.3 การบันทึกสะท้อนการเรียนรู้การเรียนรู้โดยผ่านแบบฟอร์มออนไลน์

Figure 3.5 Cluster analysis

b. Task inventory - Task inventory is the step to add on all the content details. It is sequenced from task to sub-task and sub-sub-task in table format and was verified for validity of the content by three content experts. The task inventory is illustrated in the Appendix 3.2. The example of task inventory is shown in Figure 3.6.

Task Inventory	
Sub Task: 1. สมอง (Brain)	
Sub-sub Tasks :	
1.1 การทำงานของสมอง	
1.1.1 เปลือกสมอง (Cerebral Cortex)	
1.1.2 เซลล์ประสาท (A Typical Nerve Cell)	
1.2 การเติบโตของสมอง	
1.2.1 สมองสามารถเติบโตได้	
1.2.2 ผลของสิ่งแวดล้อมต่อการเรียนรู้	
1.2.3 การเติบโตของสมองโดยผ่านการฝึกฝน	
1.2.4 ความจริงเกี่ยวกับความฉลาดและความใจ	
1.2.5 เสริมสร้างสุขภาพสมอง	
1.2.5.1 การนอน	
1.2.5.2 การรับประทานอาหาร	
1.2.5.3 การออกกำลังกาย	
Sub Task: 2. กรอบความคิด (Mindset)	
Sub-Sub Tasks :	
2.1 ความหมายของกรอบความคิด	

Figure 3.6 Task inventory

c. **Task knowledge** - In this step, the researcher gathered all information from various primary sources to ensure alignment in each task. The task knowledge included pictures, video clips, and text. The task knowledge is illustrated in Appendix 3.3. The example of task knowledge is shown as Figure 3.7.

ตารางที่ 3: Task Knowledge	
Sub Task: 1. สมอง (Brain)	
Sub-sub Tasks :	
1.1 การทำงานของสมอง	
<p>สมองสามารถพัฒนาได้เหมือนกล้ามเนื้อของส่วนอื่นๆ ของร่างกาย สมองจะมีการเปลี่ยนแปลงและแข็งแรงขึ้นเมื่อมีการใช้ งานวิจัยค้นพบว่าสมองเติบโตได้โดยผ่านการเรียนรู้ คนทั่วไปมักไม่ค่อยทราบว่าสมองของมนุษย์สามารถเติบโตได้เมื่อผ่านการฝึกฝนและเรียนรู้สิ่งใหม่ๆ เช่นเดียวกับกล้ามเนื้อที่แข็งแรงขึ้นเมื่อมีการออกกำลังกาย (Brainology, 2017)</p>	
1.1.1 เปลือกสมอง (Cerebral Cortex)	
<p>Cerebral Cortex เป็นส่วนของสมองส่วนใหญ่ที่มีเซลล์ประสาทเล็กๆ (Neurons) ที่อัดแน่นและเชื่อมต่อกันด้วยขาเซลล์ประสาทซึ่งส่งสัญญาณไปเซลล์ประสาทถัดไป สมองส่วนนี้มีหน้าที่รับผิดชอบเรื่องความคิดและการแก้ปัญหา Cerebral Cortex และเซลล์ประสาทปรากฏดังภาพ</p>	
	
1.1.2 เซลล์ประสาท (A Typical Nerve Cell)	
<p>เซลล์ประสาทที่อยู่ในสมองของเราจะเพิ่มจำนวนมากขึ้นและแข็งแรงขึ้นเมื่อมีการเรียนรู้สิ่งใหม่ๆ และยังเมื่อเจอกับสิ่งที่ท้าทายมากขึ้นเซลล์สมองก็จะเติบโตมากยิ่งขึ้น สมองที่มีความแข็งแรงและฉลาดมากขึ้นจะช่วยให้สามารถแก้ปัญหาได้ง่ายขึ้นเมื่อต้องเผชิญกับสถานการณ์ที่ยากและท้าทาย</p>	

Figure 3.7 Task knowledge

2) **Design** - The design step was to identify how Co-op students' learning occurs. In this step, the learning objectives need to be defined in order to find the right strategies to achieve it. The behavioral objectives and observable and measurable learning outcomes will be set. The Input-Action-Output Diagram (IAO), Instructional goal and observable and measurable learning outcome table are in Appendix 3.4. The example of the IAO, Instructional goal, and observable and measurable learning outcome is shown as Figure 3.8.

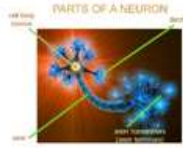
Sub Task	1. สมอง (Brain)	
Sub-sub Tasks	1.1 การทำงานของสมอง	
Input	Action	Output
1.1.1. เปลือกสมอง (Cerebral Cortex)	ดูภาพสมองและศึกษาข้อมูลเกี่ยวกับการทำงานของสมอง 	มีความรู้ในเรื่องการทำงานของสมอง
	Instructional Goal	Observable and Measureable Learning Outcome
	มีความเข้าใจว่าสมองทำงานอย่างไร	เมื่อเห็นภาพ Neurons สามารถอธิบายว่า Cerebral Cortex เป็นส่วนของสมองส่วนใหญ่ที่มีเซลล์ประสาทเล็กๆ (Neurons) ที่อัดแน่นและเชื่อมต่อกันด้วยขาเซลล์ประสาทซึ่งส่งสัญญาณไปเซลล์ประสาทถัดไป
1.1.2 เซลล์ประสาท (A Typical Nerve Cell)	1. ทำกิจกรรมฉีกกระดาษครั้งที่ 1 โดยให้เป็นวงใหญ่ที่สุด 2. เรียนรู้วิธีฉีกกระดาษ 3. ทำกิจกรรมฉีกกระดาษครั้งที่ 2	1. สามารถฉีกกระดาษเป็นวงใหญ่ได้ 2. เข้าใจว่าสมองสามารถเติบโตได้ถ้ามีการเรียนรู้สิ่งใหม่ๆ

Figure 3.8 IAO diagram, instructional goal and observable and measurable learning outcome

3) Development - This is the step to develop the most helpful programs to promote the required input and learning. The instructional instruments involve (1) The work session presentation slides, (2) The student manual, (3) The facilitator guide, (4) The online reflective journal, (5) The group discussion guideline, and (6) The individual interview session guideline. These instruments were developed according to previous analysis and align with the research framework.

(1) The work session presentation slides - The content in the presentation slides was designed in the previous section. During the process of presentation design and development, the researcher kept in mind the findings of

learners' analysis and task analysis. The connectedness of each topic and the suitable activities were considered to ensure the quality of the content and Co-op students' engagement in learning.

The presentation slides were designed based on the principles of Presentation Advantage by Franklin Covey. The mindset of the development was to increase attention, understanding, and retention of the message by creating emotionally impactful visuals. The presentation follows 'one idea per slide' with clarity to make sure that students can understand in five seconds or less. The presentation has been divided into parts with visual variety (Covey, 2018). There were a total of four parts, which are (1) Brain, (2) Mindset, (3) Self-fulfilling prophecy, and (4) Reflective journal.

(2) The student manual - The student manual was developed to help students use it as a reference in the work session. There were two parts, introduction and the content. The content part included four main topics: Brain, Mindset, Self-fulfilling prophecy, and Reflective journal. The learning activities, the self-assessment, and the practiced exercise were designed to integrate in the content to provide Co-op students with opportunities to understand the concepts, practice their thinking, and apply. Covey (2018) recommended not to use the slide deck as a handout and do not distribute data-rich handouts during the presentation.

(3) The facilitator guide - The facilitator guide was designed to help other facilitators conduct the work session effectively. The facilitator guide included the preparation part and the facilitation part. The preparation part provides the guidelines for facilitators to prepare according to the checklist. For the facilitation part, the objectives of each part, the key word scripts, were provided, including the state part,

activity instruction, and the linkage between slides. Other facilitators can be certified by using this facilitator guide.

(4) Online reflective journal - The online reflective journal was a form of self-report where Co-op students could record their situations, feelings, how to solve problems, embrace challenges, and so on. During the Cooperative Education period, Co-op students were required to record their online reflective journal weekly to reflect on their learning experiences. The online reflective journal template was designed with a Google document template.

Araceli Ruiz-Primo mentioned that systematic reflective journal writing helped the development of ideas, concepts, and procedures which were used for duplicate studies, discussing and validating findings, and developing models. Research has shown that if students write their reflections in ways that are purposeful and relevant, their learning and understanding will be improved. Students need to know why to write and be provided with the skill so they know how to write (2004). Co-op students were able to record in their online reflective journals as many times as they wished. With the provided template, Co-op students could focus on aspects that were relevant to the present study.

The online reflective journal template was designed to help Co-op students reflect on their experiences and record for further reflection. There were a total of 11 items collected in the template. They were (1) name, (2) E-mail address, (3) Date of record, (4) Date of situation, (5) Challenging/new situation, (6) Responses, (7) Learning from situation, (8) Application to future situation, (9) Use of Growth mindset and self-fulfilling prophecy, (10) Others, and (11) Attachment. The online

(5) Online group discussion guideline - To make sure that Co-op students could apply all appropriate knowledge to their real life situation, the social learning was provided through different methods. The interactive chats allowed Co-op students to participate in real-time online discussions. The researcher might involve in the conversation if needed or just be a silent observer for data gathering purposes (Hewson et al., 2003: 62-63).

The online focus group, so-called “online group discussion”, was to “enable a researcher to evaluate ideas in a group setting.” It is a more natural way for gathering data and gaining insight from the dialogue with Co-op students. For social science purposes, the focus group is to gather qualitative data and test theoretical assumptions. The online focus group is easy to manage and accessible anywhere, anytime. The drawback of an online focus group is the less impulse response; however, the in-depth response through reflection is a reasonable trade-off (Gaiser, 2008: 190-300). In this study, the online group discussion will be conducted biweekly through the online program. The size of the Co-op students was 6-8 per group participating in an online group discussion at a fixed date and time. The facilitator assumed the role of coach by asking coaching questions for Co-op students to respond to so they could be involved and engaged in the discussion on their learnings.

In the 21st century, the internet opens up new possibilities for new internet methodology. The internet research method will be introduced, providing available equipment to be used to ease time and cost limitations, with interactive chat, online focus groups, and social media and blogs to be used (Hewson et al., 2003: 62-63). In this study, the researcher used the free program (free on limited duration) called ‘ZOOM’. ZOOM is a software-based used as conference room solution around the

world. It enables meeting capabilities, is easy, and collaborates with any device with voice and visual (Zoom, 2019). Co-op students can join the online group discussion anywhere, on any device. Moreover, there is a recording feature with which the researcher can make a record and transcribe the conversation thereafter. The guideline of the online group discussion was developed to facilitate the online group discussion effectively. The online group discussion venue should be private with available internet connection. During the discussion process, the input of an anonymous third person can be considered. Since the online group discussion was a closed group, the log-in code should not be shared with anybody. The group discussion was only for Co-op students' reflection and learning. Therefore, the conversation would be kept confidential. During the group discussion, the facilitator as a coach would ask the initial questions for students to share their experiences and learning. The online group discussion guideline is shown in Appendix 3.6.

(6) **Individual interview session** - To obtain Co-op students' attitudes toward the intervention, the semi-structured individual interview session was deployed. After Co-op students completed their Cooperative Education, each Co-op student was interviewed by the researcher via the online program ZOOM. Passage (2013) defined the semi-structured interview as the use of open-ended questions through conversation to get the view and opinions on the topic. The semi-structured interview provides the balance of order and freedom, it provide uniformity across all participants even though the answers might be unstructured. The interview protocol should include instruction for the interviewer, the list of questions, the probes of the questions, space between the questions to record the response, and a concluding statement. In this study, the semi-structured interview questions were designed to seek

the attitude and opinion toward the intervention as well as students' experiences from Cooperative Education. The question lists are in Appendix 3.7.

(7) Validity of intervention instruments - Intervention instruments, which included the work session presentation slides, student manual, facilitator guide, online reflective journal, online group discussion guideline, and semi-structured interview questions, were sent to three content experts for validation. They were asked to validate all the contents, the tests, and the formats. There are some suggestions from the experts as follows:

- a. Add clear objectives in each topic so that the contents and activities would be aligned.
- b. Use case studies that related to Co-op students' context so that Co-op students can understand content more easily. The various methods of activities should be applied.
- c. The duration of the course should be longer due to the amount of content.
- d. Utilize more technology to enhance learning of Co-op students.

The validation of the intervention instruments was tested with the IOC. Three content experts unanimously rated with the mean between 0.5 – 1.

4) Implementation - Implementation is the step to use to provide the intervention and assess the readiness of the learner to use this intervention. This also includes finding out whether any additional training is needed. The pilot study was conducted with Co-op students who were equivalent to the research sample. The growth mindset and self-fulfilling prophecy work session was conducted for five Co-op

students, in the same academic year, and in an autonomous university as a pilot study. The session took 5 hours to finish.

The pre-test and post-test of the measurable learning outcome test and the observable learning outcome test were used. The researcher collected the feedback and adjusted to the instruments. The pre-test and post-test revealed that the post-test score was higher, which means that Co-op students have more knowledge and understanding. The feedback on the work session is as follows:

- (1) The work session should be longer so that students have more time to discuss
- (2) Facilitator should provide more time to do activity discussion
- (3) They like the clip video and they request to have more for their learning
- (4) Facilitator spoke to fast

All the feedback was taken into consideration and developed for the research session.

(5) Evaluation - This step is to study whether the intervention has had an effect on learning and met the set objectives or not. Has the problem been solved? And what changes should be done? The evaluation part was designed to measure the measurable and observable learning outcome.

(1) Test analysis - The pre-test and post-test of the work session were developed to measure the knowledge and understanding from the work session. There were both multiple choice and open-ended questions. The test analysis

was done to ensure that all the tasks were evaluated. The test analysis is in Appendix 3.7. The example of task analysis is in Figure 3.10.

1. สมอง (Brain)								
1.1 การทำงานของสมอง								
เนื้อหา	พฤติกรรม						รวม	หมายเหตุ
	จำ	เข้าใจ	นำไปใช้	วิเคราะห์	สังเคราะห์	ประเมินค่า		
1.1.1. เปลือกสมอง (Cerebral Cortex)	×							
1.1.2 เซลล์ประสาท (A Typical Nerve Cell)		×						Opened Questions
1.2 การเติบโตของสมอง								
เนื้อหา	พฤติกรรม						รวม	หมายเหตุ
	จำ	เข้าใจ	นำไปใช้	วิเคราะห์	สังเคราะห์	ประเมินค่า		
1.2.1 สมองสามารถเติบโตได้		×						Multiple choices
1.2.2 ผลของสิ่งแวดล้อมต่อการเรียนรู้	×	×						Multiple choices
1.2.3 การเติบโตของสมองโดยผ่านการฝึกฝน		×						Multiple choices
1.2.4 ความจริงเกี่ยวกับ	×	×						Multiple

Figure 3.10 Test analysis

(2) **The measurable learning outcome test** - The test questions were developed from the consequences of the task analysis, to evaluate Co-op students' knowledge and understanding in each task according to the test analysis. This measurable learning outcome test is used as pre-test and post-test in the work session. There were a total of 52 items of the test. Appendix 3.8 is the test questions. The example of the test questions is shown as Figure 3.11.

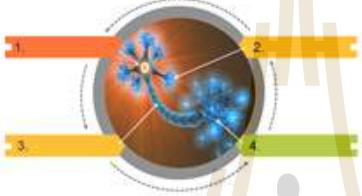
คำชี้แจง

แบบทดสอบความรู้และการประยุกต์ใช้ความรู้เกี่ยวกับเรื่องการทำงานของสมอง กรอบความคิดแบบเติบโต การคาดการณ์ของตนเองที่ส่งผลให้เกิดขึ้นจริง และการบันทึกสะท้อนการเรียนรู้

- แบบทดสอบนี้พัฒนาโดย นางสาวอังคณา ธนปิยะวณิชย์ ซึ่งใช้เป็นส่วนหนึ่งของงานวิจัยเรื่องแนวทางการพัฒนากรอบความคิดแบบเติบโตและการคาดการณ์ของตนเองที่ส่งผลให้เกิดขึ้นจริงเพื่อส่งเสริมการรับรู้ความสามารถของตนเองสำหรับนักศึกษาสหกิจศึกษา
- เวลาที่ใช้ในการทำแบบทดสอบคือ 20 นาที

ชื่อ _____ นามสกุล _____ เลขประจำตัว _____

- จงเลือกอักษร A, B, C, D ในช่องว่างที่เว้นไว้ให้ ตามชื่อส่วนประกอบของเซลล์สมอง
A. Dendrites / B. Axon Transmitters / C. Cell body / D. Axon



1. _____ 2. _____ 3. _____ 4. _____

จงกาบาทข้อที่คิดว่าถูกต้องเพียงข้อเดียว

- ข้อใดต่อไปนี้อีกต้องเกี่ยวกับการวิจัยในสมองของสัตว์

Figure 3.11 The measurable learning outcome test

(3) **The observable learning outcome test** - To ensure that Co-op students understand the contents in work session and are able to demonstrate the observable learning outcome, the test was developed to evaluate certain tasks during the work session. The Co-op students' observable learning outcome was rated by the facilitator. The Co-op students' observable learning outcome list is in Appendix 3.9. The example of the observable learning outcome is shown as Figure 3.12.

แบบประเมินความสามารถเรื่อง “กรอบความคิดแบบเติบโตและการคาดการณ์ของตนเองที่ส่งผลให้เกิดขึ้นจริง”

แบบประเมินนี้พัฒนาโดย นางสาวอังคณา ธนปิยะวณิชย์ ซึ่งใช้เป็นส่วนหนึ่งของงานวิจัยเรื่อง “แนวทางการพัฒนากรอบความคิดแบบเติบโตและและการคาดการณ์ของตนเองที่ส่งผลให้เกิดขึ้นจริงเพื่อส่งเสริมการรับรู้ความสามารถของตนเองสำหรับนักศึกษาสหกิจศึกษา”

ผู้รับการประเมินชื่อ _____ นามสกุล _____ เลขประจำตัว _____

เรื่องที่ประเมิน	ผลการประเมิน		
	ระดับ 1	ระดับ 2	ระดับ 3
1. กิจกรรมฝึกกระดาษ			
2. การใช้ Growth Mindset Rubric ในการประเมินตนเอง			
3. การตั้งเป้าหมายเพื่อพัฒนากรอบความคิดแบบเติบโต			
4. การเขียนคำมั่นสัญญาของตนเองในช่วงที่จะปฏิบัติสหกิจศึกษา			
5. การตั้งเป้าหมายที่ท้าทายในการปฏิบัติสหกิจศึกษา			
6. การใช้ QR Code เข้าสู่แบบฟอร์มออนไลน์			
7. การเข้าถึงบันทึกข้อความในแบบฟอร์มออนไลน์			
8. การเข้าถึงองค์ประกอบของแบบฟอร์มออนไลน์ 11 ข้อ			
9. การบันทึกชื่อตนเองในแบบฟอร์มออนไลน์			
10. การบันทึกอีเมลในแบบฟอร์มออนไลน์			
11. การบันทึกวันที่บันทึกในแบบฟอร์มออนไลน์			
12. การบันทึกช่วงเวลาที่เกิดเหตุการณ์ในแบบฟอร์มออนไลน์			

Figure 3.12 The observable learning outcome list

(4) **The learning outcome of the work session** - To test the understanding of students on the learned concepts from the work session, the objectives, criterion of the learning outcomes, and expected behaviors were set and measured. The detail of Objective (TPO-EO)/Criterion Chart is in Appendix 3.10. The example of Objective (TPO-EO)/Criterion Chart is shown as Figure 3.13.

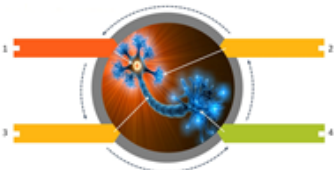

Sub Task	1. สมอง (Brain)	
Sub-sub Tasks	1.1 การทำงานของสมอง	
Sub-sub-sub task	1.1.1. เปลือกสมอง (Cerebral Cortex)	
	Objective (TPO-EO)	Criterion
	เมื่อให้ดูภาพสมองนักศึกษาสามารถบอกชื่อเรียกส่วนสำคัญของเซลล์สมอง คือ Cell body, Dendrites, Axon, Axon Transmitters ได้อย่างถูกต้อง	<p>เมื่อแสดงภาพของส่วนสมอง 4 ส่วน ดังนี้</p>  <p>นักศึกษาสามารถระบุได้ว่า ส่วนที่ 1 คือ Cell Body ส่วนที่ 2 คือ Dendrites ส่วนที่ 3 คือ Axon และ ส่วนที่ 4 คือ Axon Transmitters</p>
Sub-sub-sub task	1.1.2 เซลล์ประสาท (A Typical Nerve Cell)	
	Objective (TPO-EO)	Criterion
	เมื่อให้ทำกิจกรรมฝึกกระตาะ นักศึกษาสามารถเรียนรู้และสามารถฝึกกระตาะได้เร็วขึ้น และใหญ่มากขึ้น	<p>เมื่อให้รูปแบบตัวอย่างในการฝึกกระตาะที่เป็นระบบ 2 รูปแบบดังนี้</p> 

Figure 3.13 Objective (TPO-EO)/Criterion Chart

3.6 Data Collection

The data collection process was conducted in December 2018, one month prior to the Cooperative Education period of December 2018 – April 2019. The used data for this study to answer the research questions are from: (1) pre-test and post-test of self-efficacy, (2) the data from the online reflective journals, (3) the data from online group discussions, and (4) the data from individual interview sessions. This quasi-experimental design consists of two groups of participants: 36 Co-op students in the

control group and 36 Co-op students in the experimental group. The next section is the detail of each group.

3.6.1 The control group

The Co-op students in the control group were asked to sign the consent form to volunteer to participate in this study. The Co-op students were asked to complete the pre-test of self-efficacy online questionnaire (Google form) prior to their Cooperative Education. After they completed the Cooperative Education, the researcher sent Co-op students the link (Google form) to complete the post-test of self-efficacy. The total of the control group was 36 Co-op students.

3.6.2 The experimental group

After the introduction of the intervention process, the Co-op students in the experimental group were asked to sign the consent form to participate in this study. The experimental group completed the same pre-test of self-efficacy online questionnaire (Google form) as the control group.

The researcher, as a facilitator, conducted the work session on growth mindset and self-fulfilling prophecy. The session took 8 hours to be completed. The work session included the lecture, the activities, the practice, and the application in order to align with the design of blended learning. The pre-test and post-test questions of measurable learning outcome of the work session were distributed to Co-op students to measure their knowledge and understanding. For the observable learning outcome test of the work session, the researcher evaluated each student based on the list. The researcher asked Co-op students to make groups of five to eight to schedule the further online group discussion. There were a total of seven groups for online group discussion. During the Cooperative Education period, Co-op students reflected on their learning

and experiences and recorded in their online reflective journals at least once a week. They could record their situations as many times as they wished.

The online group discussion was conducted biweekly, starting from the second week of the Cooperative Education period. The researcher was the facilitator of the online group discussion. The Co-op students logged into the ZOOM program at their agreed schedule. The facilitator encouraged Co-op students to share their experiences and learning during the Cooperative Education from the workplace and how they used or applied the growth mindset and their self-fulfilling prophecy concepts in their working life. The facilitator asked the coaching questions to stimulate the student's thinking and learning. The learning took place during the discussion. Co-op students might ask for feedback, advice, or recommendations from their friends and facilitator during the online group discussion. Each online group discussion took about 20-30 minutes.

Post Co-op, the individual interview session was conducted thereafter through the online ZOOM program. The session took about 20-30 minutes per student. The semi-structured interview was applied. The interview questions were mainly on the overall intervention that Co-op students participated in and the gained experiences from Cooperative Education.

The data from the online reflective journal and online group discussion were employed to triangulate with the data from the semi-structured interview. All the data in the recording format, online group discussion and semi-structured interview was transcribed verbatim for data analysis.

3.7 Data Analysis

This study is a mixed method study, quasi-experimental design, in which the data collected consisted of both quantitative and qualitative data. The quantitative data was from (1) the pre-test and post-test of measurable learning outcome scores from the work session, (2) the pre-test and post-test of the self-efficacy questionnaire in the form of numerical scores, and (3) the stepwise linear regression analysis. The qualitative data was from (1) the online reflective journal, (2) online group discussion, and (3) semi-structured individual interview. The data was analyzed separately but was integrated in the interpretation and conclusion of data.

3.7.1 The analysis of quantitative data

The quantitative data was from the pre-test and post-test of the measurable learning outcome test, observable outcome test, and self-efficacy questionnaire. The mean and standard deviation analysis were used for the first two tests. The self-efficacy questionnaire was analyzed by a paired-sample t-test and stepwise linear regression analysis.

3.7.1.1 The pre-test and post-test of measurable learning outcome scores and the mean of observable learning outcome score

The first research question – ‘What are the design and development of the growth mindset and self-fulfilling prophecy intervention that enhance Cooperative Education students’ self-efficacy?’- was answered by the measurable learning outcome test and the observable learning outcome of the Co-op students after participating in the work session. The pre-test and post-test of the measurable learning outcome of the work session was conducted. The scores result was analyzed. A paired-sample t-test was used to compare the mean scores before and after the work session.

3.7.1.2 The pre-test and post-test of Co-op students' self-efficacy scores

To answer the second research question - 'What are the effects of the growth mindset and self-fulfilling prophecy intervention on Cooperative Education students' self-efficacy?'- the numerical data of pre-test and post-test mean scores of self-efficacy data were conducted. To compare the effect of the intervention toward the Co-op students' self-efficacy, a paired-sample t-test was conducted to compare the pre-test and post-test of self-efficacy scores of both the control group and the experimental group. Moreover, the study compared the difference between the faculty variable in the experimental group by using ANOVA.

3.7.1.3 The correlations between dependent variables and independent variables

In this study, we researched to see the correlation of the independent variables after intervention on the dependents variables. There were two groups of independent variables, growth mindset and self-fulfilling prophecy. Those two groups included five and four sub-independent variables, respectively. A multiple regression was conducted to study the relationship and the factors of independent variables on each of the four dependent variables. A stepwise linear regression analysis is a highly general and flexible data analytic system to test the relationship and factors of independents variables (Cohen, J., & Cohen, P., 2009: 3).

In this study, there are total nine independent variables, which are (1) Embrace challenges, (2) Persist in the face of setbacks, (3) See effort as the path to mastery, (4) Learn from criticism, (5) Find lessons and inspiration in the success of others, (6) Desired outcome, (7) Meet expectations, (8) Achievement, and (9) Awareness to avoid negative action. The first five are growth mindset influences and

the last four are the self-fulfilling prophecy influences. The dependent variables are (1) Goals, (2) Effort and persistence, (3) Learning and achievement, and (4) Activity selection.

3.7.2 The analysis of qualitative data

The analysis of qualitative data from the online reflective journal, online group discussion, and semi-structured individual interview session was conducted. The data from the online reflective journal was analyzed by using thematic coding. The coding themes were based on the independent variables as assigned theme. The online group discussion and semi-structured individual interview session were transcribed verbatim to enable the richness of the data. Then the thematic coding was employed to interpret the transcriptions.

The challenge in this research was the big size of the qualitative data from the online reflective journal (451 responses), online group discussion (211 records), and semi-structured individual interview session (36 records), and how to bring all data together in a meaningful way. Therefore, in this study, the NVIVO 12 was used. NVIVO 12 is powerful software for gaining richer insights from qualitative and mixed method data. NVIVO helped to organize, store, and retrieve data so that the researcher could work more efficiently, saving time to find data. However, the analytical skills of the researcher are still required to interpret the results of the study (NVIVO, 2019).

In this research on content analysis, the operational definitions will be defined. An operational definition is the statement of procedures the researcher is going to use in order to have a clear, concise, detailed measure of a specific variable (Therapy, 2018; System, 2019). The words used may be different depending on the context. In this research, the operational definitions of variables are defined as shown in Chapter 1

in operational definitions. As there was some coding that is not exact independent variables, the separated codes were set to categorize the data.

In summary, the quantitative data was from the pre-test and post-test of measurable learning outcome scores, the pre-test and post-test of self-efficacy scores, and stepwise linear regression analysis. The qualitative data were from different sources such as the online reflective journal, online group discussion, and semi-structured individual interview session. The thematic coding content analysis was used as supported qualitative data. The summary is illustrated in Table 3.3.

Table 3.3 The summary of data collection and data analysis

Research questions	Tools	Data	Data analysis
To design and develop the growth mindset and self-fulfilling prophecy intervention to enhance Co-op students' self-efficacy.	The pre-test and post-test of the measurable learning outcome test and the observable learning outcome test.	Numerical data of pre-test and post-test of the measurable learning outcome and observable learning outcome.	A paired-sample t-test Mean and standard deviation.
To investigate the effects of growth mindset and self-fulfilling prophecy	The pre-test and post-test of self-efficacy questionnaire.	Numerical data pre-test and post-test of self-efficacy. Data from online	A paired-sample t-test. A stepwise linear regression

Table 3.3 The summary of data collection and data analysis (Continued)

Research questions	Tools	Data	Data analysis
intervention on Co -op students' self- efficacy.	Online reflective journal template. Online group discussion. Semi-structured individual interview question list.	reflective journal. Transcribed data from online group discussion and semi-structured individual interview.	analysis. ANOVA analysis. Content analysis- thematic coding using NVIVO program to organize the data.

3.8 The Ethics in Human Research

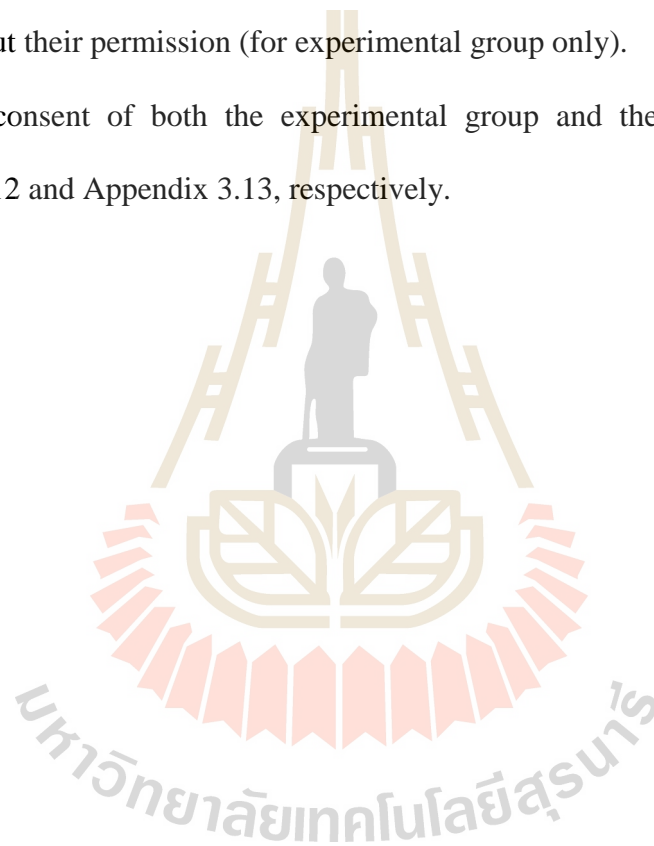
The ethics in human research was applied in this study. All designed tools were taken into consideration in ethics in human research which was just to answer the research questions and contribute to new findings. The participants made their own decision to be in and continue doing it. At Suranaree University of Technology, the researcher was required to get the approval on ethics on human research from the institutional review board. The researcher was asked to submit all related information of the study such as the research protocol, research proposal, self-assessment form, participation information sheet, informed consent form, ethical training certificate, and questionnaire. After obtaining approval, the researcher was able to conduct the research with participants. For this study, the process of informed consent was conducted with the participants of both the control group and the experimental group for them to sign. The consent form states explicitly that:

1) Co-op students entirely volunteer to participate in this study, and they can withdraw their participation anytime they want.

2) Their personal information will be kept confidential and for full anonymity. For any references, the pseudonyms will be used.

3) The video or audio recording during the online group discussion and interview will be kept confidential. All information or recordings will not be shown in public without their permission (for experimental group only).

The consent of both the experimental group and the control group is in Appendix 3.12 and Appendix 3.13, respectively.



CHAPTER 4

RESEARCH FINDINGS

This study was the quasi-experimental design with the control group and the experimental group. The 36 Co-op students in the experimental group participated in the designed intervention. This chapter presents 1) the design and development of growth mindset and self-fulfilling prophecy intervention and 2) the effect of growth mindset and self-fulfilling prophecy intervention on Co-op students' self-efficacy. Chapter 4 presents the findings of both the quantitative study from the pre-test and post-test mean scores of Co-op students' self-efficacy and the stepwise linear regression analysis, as well as the qualitative study on the online reflective journal, online group discussion, and individual interview session.

4.1 The Growth Mindset and Self-Fulfilling Prophecy Intervention

This section responds to the first research question, "What are design and development of the growth mindset and self-fulfilling prophecy intervention that enhance Cooperative Education students' self-efficacy?"

In this study, the design and development of growth mindset and self-fulfilling prophecy were based on the instructional design using ADDIE design. The intervention consisted of four main parts: (1) the work session, (2) the online reflective journal, (3) the online group discussion, and 4) the individual interview session. The overall growth mindset and self-fulfilling prophecy intervention details are illustrated in Figure 4.1.

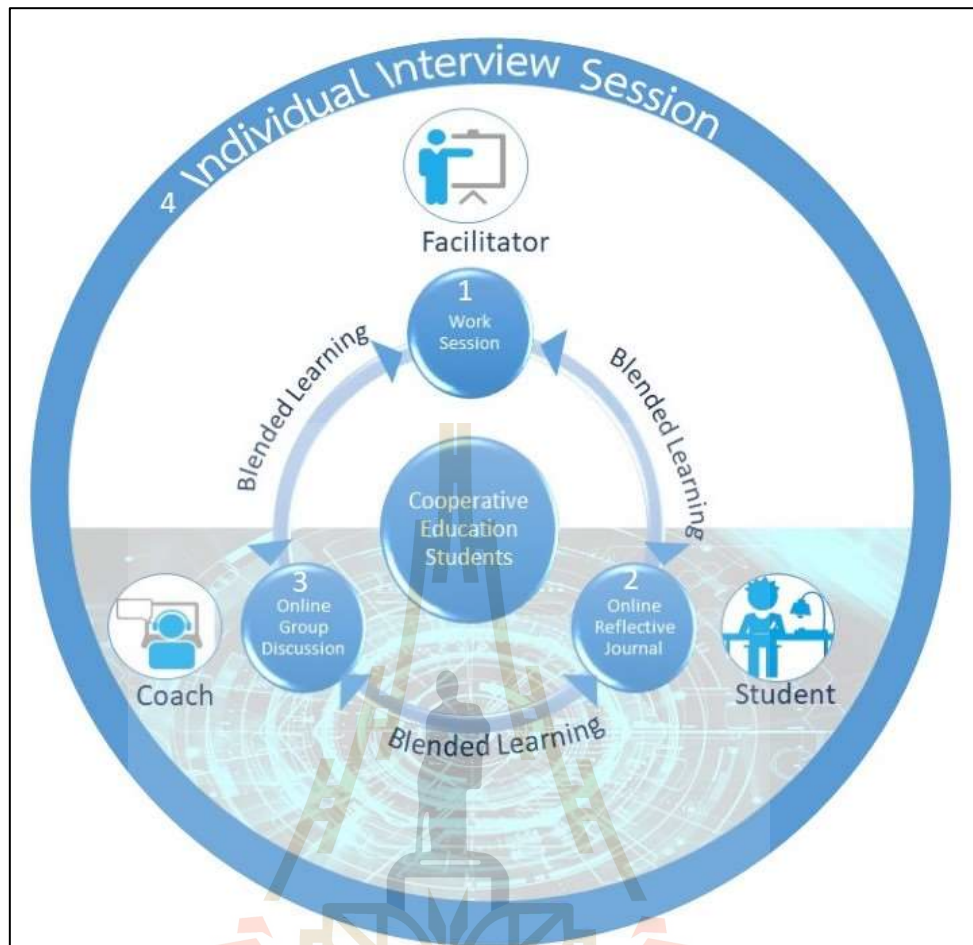


Figure 4.1 The growth mindset and the self-fulfilling prophecy intervention

The overall growth mindset and self-fulfilling prophecy intervention (intervention) was designed not only using ADDIE design but also with active learning, blended learning, learning model (70-20-10), and student-centered concepts. The intervention focused on Co-op students by equipping them with mindset, skillset, and toolset for their working lives during their Cooperative Education period. The intervention occurred in various timelines during the Cooperative Education period. The work session was conducted as one of the preparatory programs of Cooperative Education one month prior to the work starting date. During four months of working, students participated in the online reflective journal and the online group discussion. In

the post-Cooperative Education period, the students were interviewed on their reflection on intervention and Cooperative Education experiences.

The first part was the growth mindset and self-fulfilling prophecy work session, which was a face-to-face, facilitator-led, 8-hour-long session. In this study, the researcher took the role as the facilitator. Co-op students learned about the concepts of growth mindset and self-fulfilling prophecy. To ensure that the Co-op students gained knowledge and understanding of the concepts, pre-test and post-test were conducted on 52 items' measurable learning outcomes and 19 observable learning outcomes.

The second part was the online reflective journal which allowed Co-op students to reflect on their learning and applying the growth mindset and self-fulfilling prophecy concepts in the workplace. Co-op students recorded their situations online through a Google document template weekly for four months, a total of 14 weeks. Co-op students applied the concepts with their experiences and identified their gained learning.

The third part, the online group discussion, involved small groups of five to eight Co-op students who logged into the ZOOM program to have discussions with friends and the facilitator (as coach) biweekly, for seven times. Each session took about 30 minutes. Co-op students were asked to share their experiences from the workplace and their learnings.

The last part was the individual interview session. Students were interviewed after they completed their Cooperative Education. The interview took 30-60 minutes. Students reflected on the intervention and their learnings from the workplace. They expressed their attitudes toward the intervention and the learning gained from their Cooperative Education.

The overall interventions were interrelated with one another. Intervention combined different learning methods that Co-op students could take part in and learn in different ways such as the LIVE interaction from the work session, the self-learning via the online reflective journal, and learning from others through online group discussion. Co-op students could learn more with their preferable methods. The facilitator (as coach) played roles in all parts except in the online reflective journal. Those four parts of intervention complemented one another to enhance Co-op students' learning. The next section elaborates on the details of each part of intervention.

4.1.1 The growth mindset and self-fulfilling prophecy work session

In this section, the design and development of the growth mindset and self-fulfilling prophecy work session and the results of the learning outcome are presented. The work session consisted of three work session materials: the presentation slides, the student manual, and the facilitator guide.

4.1.1.1 The design and development of the growth mindset and self-fulfilling prophecy work session

The first part of intervention was the work session. The objectives of the work session were to provide Co-op students the concepts of growth mindset and self-fulfilling prophecy, practice the skills to develop their thinking and mindset, and equip them with the development tools. The work session was an 8-hour, face-to-face workshop led by the facilitator, and individual work and group activities. In the work session, Co-op students participated in various kinds of learning which included concept lecture, individual activities and reflection, peer discussion, video clip, and class sharing. In this study, all 36 Co-op students fully attended the work session. All Co-op students were distributed the student manual for their learning record and

reference. In this study, the facilitator was certified on the concept and facilitation skill. Therefore, the facilitator guide was developed to ensure the standard of the concept and delivery by others facilitators. The outcome of the design and development of the work session consisted of three work session materials: the presentation slides, the student manual, and the facilitator guide.

1) The presentation slides of the work session were based on the instructional design and were used for explaining and showing the video clip so that Co-op students learned more on the concept. With the active learning design, Co-op students were encouraged to participate and interact with friends through various activities; self-assessment, video watching, case study, role play, and experience sharing. There were a total of four main topics: 1) Brain, 2) Mindset, 3) Self-fulfilling prophecy, and 4) Reflective journal. The presentation slides of the work session are in Appendix 4.1. The examples of some presentation slides are illustrated as figure 4.2.



Figure 4.2 Examples of work session presentation slides

2) The student manual was designed to enhance Co-op students' learnings in the work session. The objectives of the student manual were for Co-op students' self-learning record and reference. There were a total of four main topics which aligned with the presentation slides. This also included four self-assessments: brain health test, mindset test, growth mindset rubrics test, and stress test for Co-op students to reflect upon themselves. The "fill in the blank" page in the student manual was for Co-op students to take notes on the key learnings by themselves. The student manual is shown in Appendix 4.2. The example of the student manual is shown as Figure 4.3.

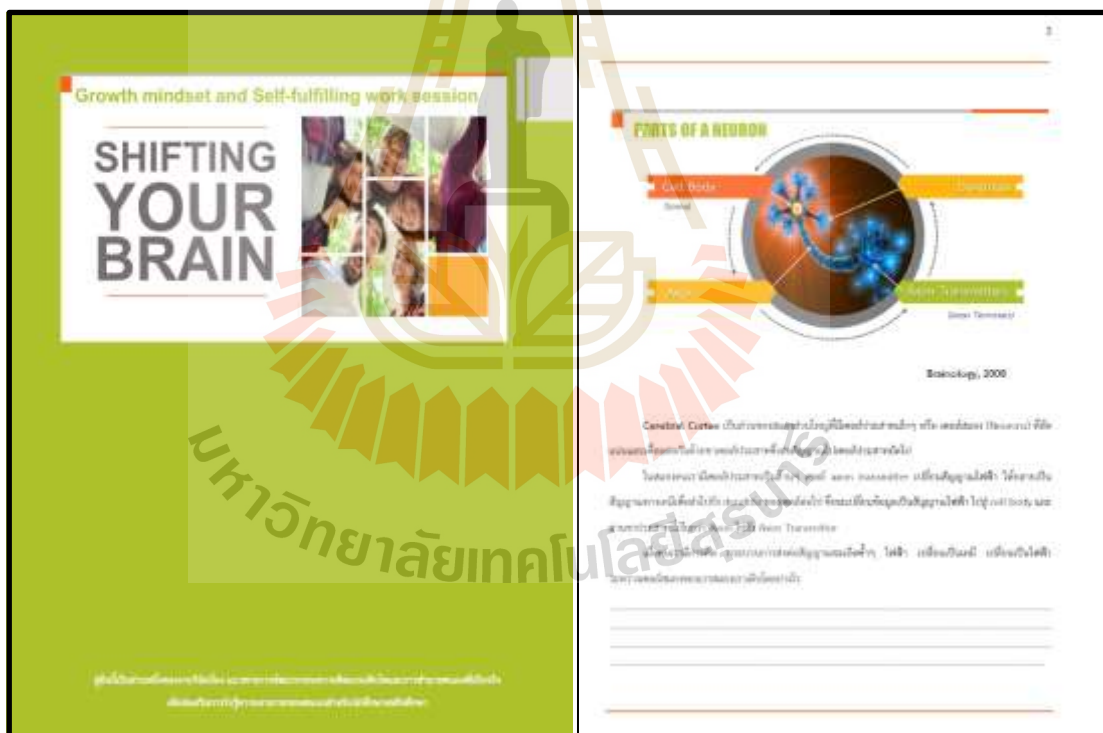


Figure 4.3 Student manual

3) In the work session, the facilitator played roles as a content provider, a coach by asking questions, and an expert in encouraging Co-op students' learning. The facilitator guide was developed to ensure the standard and consistence of

contents and delivery for other facilitators. The facilitator guide included the preparation for the work session, work session materials, the video list, the objectives of each topics, the scripts of key contents, and the activities instruction. The facilitator guide is in Appendix 4.3. The example of facilitator guide is illustrated in Figure 4.4.

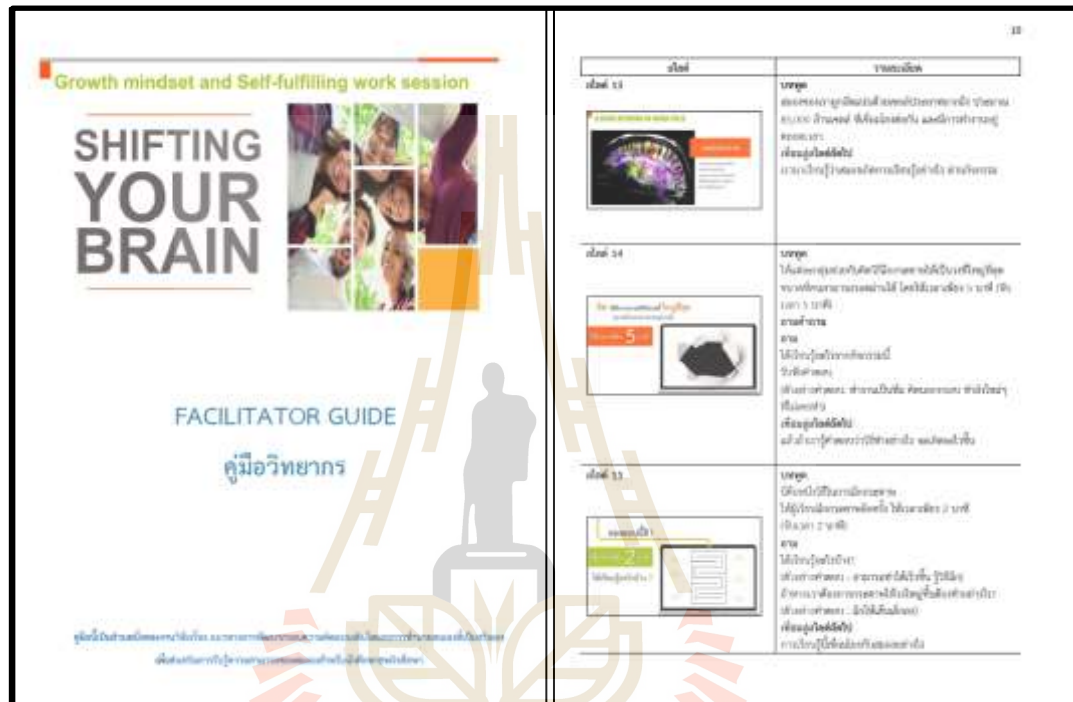


Figure 4.4 Facilitator guide

In summary, the work session was designed to provide the concepts of growth mindset and self-fulfilling prophecy for Co-op students. The work session was an 8-hour, face-to-face, facilitator-led workshop. The design and developments consisted of three materials: the presentation slides, the student manual, and the facilitator guide.

4.1.1.2 Results of the work session learning outcome and Co-op students' attitudes toward the work session.

There were the pre-test and post-test of the 52 items of the measurable

learning outcome test and the 19 items of the observable learning outcome test during the work session. The measurable learning outcome test aimed to measure the Co-op students' knowledge and understanding of the growth mindset and self-fulfilling prophecy concepts. The observable learning outcome was to measure the Co-op students' performance on activities during the work session which was rated by the facilitator's observation.

The raw scores of the pre-test and post-test of the measurable learning outcome test were obtained. A paired-sample t-test was run to determine whether there was a statistically significant mean difference of Co-op students' knowledge and understanding of the concepts before and after the work session. As a result, in Table 4.1 the paired-sample t-test shows a statistically significant difference in the pre-test mean scores ($\bar{x}=53.073$, $SD=5.469$) and the post-test mean scores ($\bar{x}=59.317$, $SD=2.927$); $p<.001$. This indicated that Co-op students gained growth mindset and self-fulfilling prophecy concepts from the activities in the work session. Apparently, the standard deviation of the pre-test ($SD =5.469$) shows that there were some differences among Co-op students before the work session. However, the scores dispersion decreased 2.542 points after the work session, which implied a positive effect of the work session on Co-op students' knowledge and understanding.

Table 4.1 The mean score of the pre-test and post-test of measurable learning outcome of the work session

	n	Mean	Std. Deviation	t	Sig.
Pre-test	36	53.073	5.469	8.635	.000*
Post-test	36	59.317	2.927		

Remark: * Significant difference

Moreover, the items of the measurable test were categorized into four main topics, which were (1) Brain, (2) Mindset, (3) Self-fulfilling prophecy, and (4) Reflective journal. A paired-sample t-test was also run to determine whether there was a statistically significant mean difference of Co-op students' knowledge and understanding of the concept in each topic before and after the work session. From Table 4.2, the results show a statistically significant difference in the mean scores of every topic. It revealed that Co-op students gained knowledge and understanding of the concepts from the work session as set objectives.

Table 4.2 The mean scores of the pre-test and post-test of measurable learning outcome of the work session by each topic

Topics	Mean	Std. Deviation	t	Sig. (2-tailed)
Brain	-1.22857	.91026	-7.985	.000*
Mindset	-2.58333	2.43046	-6.377	.000*
- Learning Strategy	-.52778	.87786	-3.607	.001*
- Stress Management	-.75000	1.18019	-3.813	.001*
Self-fulfilling Prophecy	-1.13889	1.53349	-4.456	.000*

Table 4.2 The mean scores of the pre-test and post-test of measurable learning outcome of the work session by each topic (Continued)

Topics	Mean	Std.Deviation	t	Sig. (2-tailed)
Reflective Journal	-.33333	1.09545	-1.826	.076*

Remark: * Significant difference

In addition, the observable learning outcome of Co-op students' performance on activities during the work session were rated. The obtained raw scores were analyzed by using the mean and standard deviation analysis. The result was shown in Table 4.3. The result showed very high mean scores on observable learning outcome in general, which implied that Co-op students could do assigned activities during the work session. Most Co-op students got the full scores by demonstrating their abilities in each activity. The mean score of the performance test was 2.95 with SD 0.0359. The small standard deviation indicated that the student group was unified in the observable learning outcome test. The least score of the performance test was from the last items of online reflective journal practice.

Table 4.3 The mean score of observable learning outcome test

	n	Mean	Median	Mode	Std.Deviation	Min.	Max.
Average	36	2.954	2.947	2.9473	.0359	2.842	3.0

In addition, Co-op students revealed their attitudes toward the work session. All of them expressed very positively about the work session. They mentioned that the work session provided them the concepts of growth mindset and self-fulfilling prophecy which they could apply in their workplaces. They changed their mindset and work happier in the workplaces. Ten Co-op students gave feedback that

the work session was too short so there was less time in discussion. They suggested that there should be more activities and might be organized as a camp for a few days so that all Co-op students had time to make more connections and learned from one another. Another valid feedback was the work session should be conducted not too early from the start date of working so that Co-op students still remembered what they learned from the session. There was one student who gave feedback on the student manual that all contents should be provided so that Co-op students would not worry about noting it down. This feedback would be taken into consideration to provide more contents as appropriate. The excerpts illustrate the Co-op students' attitudes toward the work session.

I 10: The work session was very useful. The content urged me to think positively and also create learning.

I 1: It was very useful, especially in the first two months of the Cooperative Education period.

I 16: All contents were useful. It (the work session) opened my mindset. I could view the situations either in fixed or growth mindset.

I 4: I would like to have more time for the work session. It could be like two to three days of a learning camp.

I 14: I would like to have more activities rather than a lecture so that the work session was not boring.

I 17: There should be all contents appearing in the presentation slides in the student manual, since I could not follow your slides. I missed out on some contents.

I 21: The time lag between the day of the work session and the

starting date of Cooperative Education was too far, so that I might forget the contents.

In conclusion, Co-op students gained the knowledge and understanding of the growth mindset and self-fulfilling prophecy concepts from the work session. The results of both the measurable and the observable learning outcomes were positive and found statistically significant difference. Co-op students also gave a positive attitude on the practicality and applicability of the growth mindset and self-fulfilling prophecy concepts.

4.1.2 Online reflective journal

The design and development of the online reflective journal and the result of the use of the online reflective journal are presented in this section. The results are the reflective journal template and Co-op students' attitudes toward the online reflective journal.

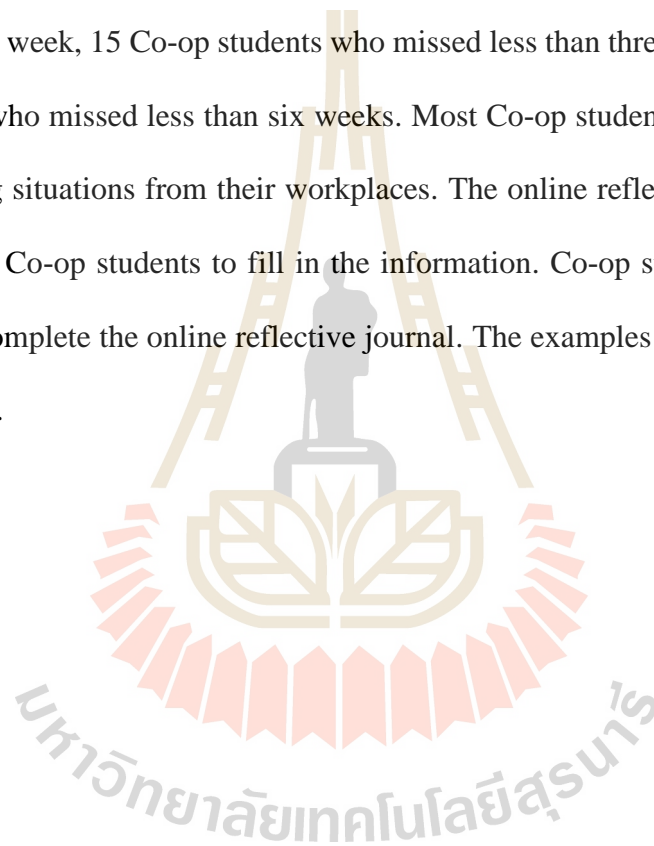
4.1.2.1 The design and development of online reflective journal

The second part of the intervention was the online reflective journal which aimed to provide the area for Co-op students to reflect on their learning and apply the growth mindset and self-fulfilling prophecy concepts in the workplace. With 21st century technology, the online reflective journal was done online through a Google document template as shown in Appendix 3.5. The access to a Google document template was provided via URL or QR code. Co-op students recorded the online reflective journal at least once a week, for a total of 14 weeks during their Cooperative Education period. Co-op students reflected on their working experience and recorded their reflection and learning in the journal. There were a total of 11 items of data collected in the online reflective journal template. They were (1) Name, (2) E-mail address, (3) Date of record, (4) Date of situation, (5) Challenging/new situation,

(6) Responses, (7) Learning from situation, (8) Application to future situation, (9) Use of growth mindset and self-fulfilling prophecy, (10) Others, and (11) Attachment.

4.1.2.2 Results of use of online reflective journal and Co-op students' attitudes toward the online reflective journal

After 14 weeks of Cooperative Education, 36 Co-op students recorded a total of 541 journal. There were 17 Co-op students who recorded in the journal every week, 15 Co-op students who missed less than three weeks, and four Co-op students who missed less than six weeks. Most Co-op students were able to record their learning situations from their workplaces. The online reflective journal template was easy for Co-op students to fill in the information. Co-op students took about 10 minutes to complete the online reflective journal. The examples of student records are as Figure 4.5.



คำถาม การตอบกลับ 451

คำตอบ 451 ข้อ

ข้อมูลสรุป แยกรายการ

เปิดรับคำตอบ

nurmasuree.y@ku.th (1) < 58 จาก 451 >

ไม่สามารถแก้ไขการตอบกลับได้

Reflective Journal

แบบฟอร์มบันทึกประสบการณ์และการเรียนรู้ของนักศึกษาสหกิจศึกษา
 นักศึกษาทำการบันทึกเหตุการณ์ที่ได้เรียนรู้ระหว่างปฏิบัติสหกิจศึกษา อย่างน้อย สัปดาห์ละ 1 ครั้ง ในทุกวันศุกร์ของสัปดาห์
 การบันทึกนี้อาจใช้เวลาประมาณ 15-20 นาที
 กรุณาอธิบายสถานการณ์ โดยละเอียด เพื่อประโยชน์ในการนำข้อมูลมาส่งเสริมการเรียนรู้ของนักศึกษา

ขอขอบคุณทุกท่านที่ให้ความร่วมมือในการจดบันทึก

*จำเป็น

ที่อยู่อีเมล *

nurmasuree.y@ku.th

ชื่อ *

นุรมาสุรี แยนนา

Figure 4.5 The examples of online reflective journal records

เลขประจำตัวนิสิต *

5840202754

คณะ *

คณะทรัพยากรธรรมชาติและอุตสาหกรรมเกษตร

คณะวิทยาศาสตร์และวิศวกรรมศาสตร์

คณะศิลปศาสตร์และวิทยาการจัดการ

วันที่บันทึก *

ดด วว ปปปป

01 / 25 / 2019

การบันทึกเหตุการณ์ในช่วงวันที่ *

วันที่ 21 - 27 มกราคม 2562

สถานการณ์ / ความท้าทายใหม่ๆ ที่เกิดขึ้น *

ความท้าทายสำหรับหนูในสัปดาห์นี้คือการลงwindows. ให้คอมฯในบริษัท ปกติเคยลงมาแล้วตอนอยู่ม. แต่พอมาลงที่บริษัทก็เกิดการเรียนรู้ใหม่ก็คือวิธีลงต่างกัน เพราะเป็นwindows ที่อยู่ภายใต้การดูแลของบริษัท ซึ่งทำให้ต้องเรียนรู้ใหม่ และทำหลายครั้งเพราะถ่วงผิดก็กระทบกับหลายส่วนเลย

การตอบสนอง / การแก้ไขปัญหา *

แก้ปัญหาก็คือ ตอนแรกก็ทำไม่ค่อยได้แต่อาศัยการทำซ้ำๆ ช่วงที่ว่างก็หาเครื่องลงเรื่อยๆ ให้มันชินจนชำนาญ

สิ่งที่ได้เรียนรู้จากเหตุการณ์นี้ *

การทำอะไรซ้ำๆทำให้เราสามารถพัฒนาศักยภาพให้ดีขึ้น ทำให้สามารถทำได้ดีขึ้นและมีโอกาสพัฒนาขึ้น

ถ้าย้อนเวลากลับไปใหม่ได้ หรือเกิดเหตุการณ์นี้อีก ท่านจะทำอะไรที่แตกต่าง *

เกิดเหตุการณ์นี้อีกก็จะทำให้ได้ดีกว่านี้ จะเรียนรู้ให้ได้มากกว่านี้

Figure 4.5 The examples of online reflective journal records (Continued)

เรื่องนี้สอดคล้องกับการเรียนรู้เรื่องใดบ้าง (ตอบได้มากกว่า 1 ข้อ) *

การตั้งเป้าหมายที่ท้าทายและชัดเจน

การพยายามเพื่อให้เกิดความเชี่ยวชาญ

การเพียรพยายามเพื่อก้าวข้ามอุปสรรค

การรับคำติชมจากผู้อื่น

การเรียนรู้และสร้างแรงบันดาลใจจากความสำเร็จของผู้อื่น

การบรรลุเป้าหมายที่ตั้งไว้

การเรียนรู้สิ่งใหม่ที่เกิดขึ้น

การบรรลุความคาดหวังของคนอื่น

การเรียนรู้ที่จะลด ละ เลิก กิจกรรมที่ไม่เป็นประโยชน์

อื่นๆ

อื่นๆ กรุณาระบุ

ข้อสังเกตและ ความคิดเห็นอื่นๆ เพิ่มเติม

เนื่องจากสัปดาห์นี้ที่เขามอบหมายงานให้น้อยมากๆ เวลาว่างๆก็เบื่อบ้างๆเลยคะ เลยพยายามหาอะไรทำก็เลยอาศัยความกล้าขอพี่เขาตามไปไซต์งาน เพราะตั้งใจไว้แล้วว่าจะต้องให้ได้ความรู้มากที่สุด ใน4เดือนนี้

กรุณาแนบไฟล์เพื่อประกอบการจัดบันทึก (ถ้ามี)

Figure 4.5 The examples of online reflective journal records (Continued)

Students found that the online reflective journal was very useful. They could keep a record of their challenging situations that happened in the workplace and use that for self-reflection afterwards. The usefulness of the online reflective journal led feedback on frequency, with two Co-op students recommending to record

more than once a week while most Co-op students agreed on once a week as appropriate and practical. However, two Co-op students recommended to record in it biweekly since they felt there were no significant situations from which they could learn more. The online reflective journal might not be preferred by all Co-op students in terms of writing. Three Co-op students mentioned their preferences to have a different learning method. They preferred to have dialogue with others rather than writing. This information may be the reason for some Co-op students not recording in the journal every week. They also needed more discussion on the online reflective journal during the online group discussion so that Co-op students could seek out group help. The following excerpts illustrate the feedback on the online reflective journal.

I 32: I am not good at writing. I didn't know how to explain in writing. I thought the online reflective journal was good as a part of intervention. However, I would like to share my story by talking, which would have made it more informative.

I 2: I wanted the facilitator to mention about the information of the online reflective journal during the online group discussion. We should discuss how to solve problems and needed advice from the facilitator.

In summary, the online reflective journal provided Co-op students a way to reflect on the learning situations in the workplace. Most Co-op students recorded in the online reflective journal regularly. They also wanted to discuss more on what they recorded in the journal during the online group discussion. Co-op students found that the online reflective journal was very useful.

4.1.3 Online group discussion

This section presented the design and development of online group discussion together with the results of the use of online group discussion and Co-op students' attitudes toward online group discussion.

4.1.3.1 The design and development of online group discussion

The third main part of the intervention was the online group discussion. The objectives of online group discussion were for Co-op students to share their experiences, learn from others' situations, reflect upon themselves, and help one another to solve problems. Online group discussion was conducted via the ZOOM program biweekly, seven times in total. There were five to eight Co-op students per group, a total of seven groups. Each group took about 30 minutes for discussion. The schedule of online group discussion was fixed and Co-op students logged in at the designated date and time. The schedule was shown in Table 4.4. Online group discussion was led by the facilitator as a coach. Co-op students were encouraged to share their challenging situations or experiences with others. They also were able to learn from others' experiences and reflect themselves upon others' situations. Co-op students who faced challenging situations might get solutions from their friends and coach.

Table 4.4 Schedule of online group discussion

Group	No. of Co-op students	Date	Time
1	7	Thursday	19:00 - 19:30
2	4	Friday	20:00 - 20.30
3	5	Friday	20:30 - 21.00

Table 4.4 Schedule of online group discussion (Continued)

Group	No. of Co-op students	Date	Time
4	5	Saturday	18:00 - 18:30
5	7	Saturday	19:00 - 19:30
6	5	Saturday	20:00 - 20:30
7	3	Monday	19:00 - 19:30

4.1.3.2 Results of the use of online group discussion and Co-op students' attitudes toward the online group discussion

The online group discussion was conducted biweekly for a total of seven weeks, 49 times. Some 60% of Co-op students attended biweekly, and 40% missed one or two times. The reasons they missed the online group discussion were their working shift pattern, an internet connection problem, and urgent assignments from their managers. The main roles of the facilitator were to facilitate the discussion, ask coaching questions, and listen to Co-op students' concerns and offer the appropriate advice. In some cases, the facilitator coached Co-op students by asking coaching questions so that Co-op students could find the solution by themselves or gave advice as appropriate. The online group discussion was quite informal. Therefore, Co-op students felt safe to share any challenging situations. They enjoyed having conversation in online group discussion and learned from others' situations. Co-op students expected the facilitator's roles of listening and understanding to help them solve problems. The facilitator of online group discussion might not necessarily be their advisor or professor. He or she could be anyone who understood the concepts and was equipped with experience, had consulting skills, and was able to coach the Co-op students.

Since students valued the benefits of online group discussion, some Co-op students preferred to have online group discussion more often, such as weekly. Only two Co-op students suggested to have it once every three weeks and monthly. This implied that most Co-op students found that the online group discussion was useful. The following excerpts are illustrated Co-op students' opinions on the online group discussion.

I 14: There should be online group discussion weekly in the first month to allow Co-op students to adapt themselves to the workplace. At the second month onwards, the online group discussion could be conducted biweekly.

I 4: I preferred weekly because I wanted to share my problems and I didn't know how to solve them and I had no one to talk to. If I waited till next week, there was no feelings on that situation to share.

I 20: The appropriate date and time depended on the nature of the work in each company. As my friends did the shift work, it was not convenient for them to join the online group discussion.

In addition, four Co-op students wanted the facilitator to encourage Co-op students to have more participation and discussion. To have more varieties of Co-op students' experiences sharing, the Co-op students in online group discussion would be from various faculties. The excerpts are illustrated as follows:

I 10: I wanted to have more discussion between Co-op students. There might be some good helpful ideas from others. Sometimes, I wanted to make some points but I just listened.

I 3: The facilitator should ask for Co-op students' opinions in solving problems by using the growth mindset.

I 7: Co-op students should be encouraged to share their ideas and their own experiences in solving problems. They have the right to share; there's no need to wait for an invitation to talk.

I 23: The Co-op students in each group should be from various faculties so that we can learn different types of work and companies.

In conclusion, the online group discussion was very useful for Co-op students as a platform for Co-op students to share and learn from their experiences. With the support from the facilitator, Co-op students felt safe and were encouraged to discuss problems and they found solutions.

4.1.4 The individual interview session

This section presented the design and development of the individual interview session. The results of individual interview sessions on Co-op students' attitudes toward overall intervention and gained experiences from Cooperative Education are presented in the next topic.

4.1.4.1 The design and development of the individual interview session

The last part of the intervention was the individual interview session. After completion of the Cooperative Education period, each student was interviewed on their reflections on the intervention application and learning experience from the workplace. The individual interview session took 15-30 minutes via the ZOOM program.

4.1.4.2 Results of the individual interview session

Co-op students reflected on the overall intervention and their learning from Cooperative Education. All students revealed a positive attitude toward the overall intervention. With the intervention during Cooperative Education, Co-op

students cultivated learning outcomes from their Cooperative Education. The results of individual interview sessions and the Co-op students' excerpts are presented in next section.

4.1.5 Co-op students' attitudes toward overall intervention

The Co-op students revealed their attitudes toward the overall intervention and learning experiences from their Cooperative Education. All Co-op students had a positive attitude toward overall intervention – work session, online reflective journal, online group discussion, and individual interview session. They would recommend this intervention to be implemented for all Cooperative Education students. They confirmed that this intervention was very useful and applicable for their working life. Co-op students voiced some views on the benefits of overall intervention, which are (1) Mindset and positive thinking, (2) Learning application in the workplace, (3) Self-reflection and learning, (4) Learning from others, and (5) Channel to release their stress and feeling. The following session presented the details of each topic.

4.1.5.1 Intervention enabled Co-op students to shift their mindset to a growth mindset and have positive thinking

Most Co-op students expressed their opinion that they believed the mindset was very important. In the past, they might not have been aware of the importance of mindset. Once they knew more about mindset, they started changing their mindset in viewing things, which led to change in their thoughts and actions toward situations. They also mentioned that the mindset was very useful and could be applied to their work such as setting goals, planning work, achieving goals, welcoming criticism, and embracing challenging situations. They have more positive thinking in

dealing with others. The following excerpts show Co-op students' shift in their mindset to a growth mindset and positive thinking.

I 11: I never thought about mindset. Once I learned about mindset, I knew that if I changed my mindset just a little bit, I could do my study and my work better. It (growth mindset) reminded me to be more conscious about doing things.

I 19: It was very useful to me. I have changed from old me to new me. I had changed my thinking to be able to work with others and be more considerate. Since things might not go as planned, I needed to adjust and work with others to get the job done.

I 23: I used to be a pessimistic person. I have changed my thinking to be more positive and optimistic.

I 25: I set goals at the second week and planned all the works. There were challenging situations coming in. I got constructive feedback from my boss and I learned from criticism.

I 34: I adapted myself from the work session. For some topics, I didn't quite understand during the work session until I had faced that during my work in the workplace. I understand it now.

I 9: When I faced the situation, I realized that it was about mindset which was so important and needed to be changed. For example, in the past, when I got the negative feedback, I tended to be stressful. But with the growth mindset, I felt thankful for the feedback which I could reflect upon myself. It was able to apply with our lives.

I 10: It was useful. It stimulated positive thinking and enhanced my learning.

I 2: I used growth mindset to remind my colleagues to think in a positive way. It could be useful with self and others.

I 23: If I didn't have the chance to join the work session, I would never have known about growth mindset. I might not have opened my mind to face the challenges. It was good for me to be well-prepared and open-minded to welcome any challenges like a half-full glass.

I 4: I think it (the work session) was very useful. It was about the growth mindset that can change my thinking. Previously, I had a very fixed mindset, and after I joined the work session, my attitude was changed. I opened my mind and tried to understand others. A better attitude improved my character, personality, and the way I respond to others.

I 5: It was very useful and helped me to have positive thinking.

4.1.5.2 Co-op students could apply their learning from the work session in the workplace

The first part of intervention, the work session, was one of the preparatory programs for their Cooperative Education. Most Co-op students applied their learning from the work session in the workplace. The growth mindset opened their minds on how they deal with challenging situations in the workplace such as persisting in the face of setbacks, seeing effort as a path to mastery, learning from others' success, and working under pressure. The excerpts illustrate Co-op students' application of the intervention in the workplace.

I 12: It was very useful especially during the first two months of working.

I 7: I used growth mindset in the workplace. If I didn't know about growth mindset, I might have kept doing the same. I did use the growth mindset such as seeing lessons and inspiration in the success of others, achieving goals. It urged me to use it while I worked.

I 11: If there was no intervention, I just worked and did nothing, no motivation, no reflection each week. I had set goals before coming to work here and kept reflecting upon myself.

I 16: I thought the overall intervention was useful. It developed our thinking to face challenging situations which turned out to be negative. Once you felt negative, the effort declined and things let you down. I learned to think like growth mindset people, positive thinking, and find the way to persist in the face of setbacks. ... It prepared us to stay in a different environment outside of university. In the workplace, there was pressure and stress from negative thinking. We needed to turn the situation to the better.

I 24: It (intervention) was good for Co-op students who worked at a company alone during four months. This helped Co-op students have someone to talk to.

I 7: If I didn't know about growth mindset, when there was situation, I would have respond normally. After I knew about growth mindset, when I faced a situation, I told myself that this was about persisting in the face of setbacks, seeing effort as the path of mastery, and finding lessons and inspiration in the success of others. It reminded me and I had a thought on it.

4.1.5.3 Intervention encouraged Co-op students on self-reflection and learning

Co-op students reflected upon themselves throughout the intervention. In the work session, students did the self-test of brain health test, mindset test, growth mindset rubrics test, and stress test which Co-op students could reflect upon themselves on how effective their lives were. Co-op students reported positive views in recording their experiences and learnings on the online reflective journal, which helped the Co-op students in reflecting on situations in the past and how they responded to those situations. They were aware of themselves more, and learned not to repeat the same mistakes and to make the right decisions in the future. With the journal, they could see how they learned and grew. During the online group discussion, students reflected upon themselves while they listened to others' challenging situations. And, in the individual interview session, students reflected on their overall intervention and learning that took place during their Cooperative Education period. The excerpts show the Co-op students' reflections throughout the intervention.

I 17: It was very useful content (the work session). It helped to reflect on whether I was a fixed mindset or growth mindset person. I could see more in me.

I 10: I think it (the online reflective journal) was very useful. It was like you lectured on what you faced. You were able to remember it like you read a book twice. It reminded me that I was able to do it and that made me smile. It allowed me to see my mistakes and my areas for improvement from criticism. It reflected what worked around me and I tried to put more effort.

I 5: I reflected on my past experiences and how I responded to them, how I solved those problem. It helped me on how I respond to the criticism from my mentor, on how I should behave when I was in the meeting room.

I 12: It (the online reflective journal) was very useful in seeing our mistakes and making points on it. A week or two weeks later, I came back and checked whether I still repeated the same mistakes. If I did not repeat, then I was successful in solving problems. If I did repeat, I looked for other factors contributing to that problem.

I 14: Reflection was very useful. The learned experiences helped to make the right decisions on future situations. It was worth spending the time doing reflection because I gained more experience and knew how to solve problems.

I 19: I lacked awareness of making mistakes. The online reflective journal helped me realize the mistakes and improve them for the better.

I 25: It was very useful since my job involves the laboratory, which requires good planning. Whenever the plan fails, the consequence is that the testing fails too. The online reflective journal helped to record the cause and effect and the next step for future use.

I 29: I found the online reflective journal to be good and useful. When I faced a challenging situation, I recorded that in the journal.

I 2: (online group discussion) I knew my thoughts in each week. I reflected on what I had done in the past week, how I persisted in the setback. It seem like a stair that I stepped up every day. It showed how far I grew up on myself and my thinking.

I 3: (online group discussion) I reflected on the past week's experience and monitored how progress of my growth mindset and positive thinking was during the online group discussion. I looked into myself rather than had bias with others. The reflection reminded me whether we did the best or not and tried to make things better.

4.1.5.4 Co-op students learned from their friends and facilitator during the work session and online group discussion in the intervention process

Co-op students learned from their friends and facilitator during the work session and online group discussion. During the work session, Co-op students had chances to discuss the contents, case studies, and activities with peers. In the online group discussion, they learned from friends and the facilitator on the challenging situations from workplaces. Co-op students used the suggestions or advice from friends and the facilitator to solve their problems. They also learned from their friends' situations and did the reflection. They put themselves in others' shoes and practiced their thinking on how they would respond in that situation where learnings occurred. The following sections are (1) Co-op students learned from their friends and (2) Co-op students learned from their facilitator during the work session and online group discussion.

1) Co-op students learned from their friends during the work session and online group discussion.

Co-op students found the online group discussion to be useful as a platform for Co-op students' sharing their working experiences and learning from one another. They felt motivated and encouraged from their friends' stories by learning from their successes and failures. Moreover, Co-op students could make connections with their friends during the Cooperative Education period. The excerpts illustrate Co-op students' learnings from their friends.

I9: We had to do both self-learning and learning from others.

We used others' stories as a case study and applied it at the right time.

I 11: I had a session for sharing one another's stories. I felt like there were parents keeping asking how you have been. I was glad to share my daily life to my friends.

I 13: I learned from listening to my friends' stories. I learned from their situations and adapted to mine. Or, if I faced this kind of problem, I knew how to respond. It was very useful.

I 21: I learned from others' experiences. When others shared their experiences, I tried to put myself in their shoes and thought about what I would do if I were them. ... Sometimes when I faced a problem I felt down. But once I joined the online group discussion, I felt motivated from others' problems. I put more effort and perseverance into making the situation better.

I 23: I felt lonely and hardly talked to friends in others' company. The online group discussion gave me chance to know more about others' companies and what did my friends do. We kept in touch and updated.

2) Co-op students learned from the facilitator during the work session and online group discussion.

Co-op students might face challenging situations and they could not find the solutions. They used the online group discussion on seeking advice from friends or the facilitator. The online group discussion provided them the safe area to express their feeling and have someone to listen to. The discussions were not only about work or projects but also personal topics. The facilitator helped Co-op students to find the solutions by asking coaching questions and allowing them to reflect on situations. Co-op students expected the facilitator to be skillful, have empathy, be helpful, and be considerate so that they could consult and ask for advice. They also felt

motivated and encouraged during the online group discussion. The following excerpts show the support Co-op students gained from the facilitator during the work session and online group discussion.

I 35: The online group discussion allowed us to listen to one another. ... The good thing was that there is someone who has work experiences to share and is ready to listen to our problems. We are in the same boat.

I 24: I thought the online group discussion was very useful. We exchanged knowledge and learning with others and the facilitator. ... When we did the online reflective journal, it was our self-reflection, while in the online group discussion we learned from others.

I 34: There was a problem that I didn't know how to solve. I took this chance to share and seek advice from the facilitator. I followed the facilitator's advice and tried to do it. Ultimately, it got better.

I 35: If there was any problems, I consulted with the facilitator.

I 4: There were problems that I was comfortable in sharing only with friends and the facilitator and I sought advice from the facilitator. Others knew my problems and I knew their problems, too.

I 24: There were some problems that we were uncomfortable to talk to our advisor about; we talked to the facilitator instead.

I 11: I wanted to have someone to talk to when I couldn't solve problems by myself. I wanted to seek others' opinions. I wanted someone to listen to me when I shared my stories. It would be more relaxing if the facilitator is not advisor or professor. Like you (the facilitator), I was comfortable to share with. I felt that you were

one of my friends.

I 14: I thought the facilitator was the consultant when I did the mistake. The facilitator provided advice on whichever topic was not related to the project.

I 16: The facilitator provided advice on problems. Sometimes I had a fixed mindset toward a problem. The facilitator was able to tell me how I changed to have a growth mindset in solving problems. Facilitators might not be our advisors or professors.

I 19: You did well as facilitator. Whenever I had problems, I always talked to you and you gave me advice. Sometimes I could not talk to my professor but my friends and seniors.

I 22: I expected understanding from the facilitator. It was quite sensitive to share daily life. You (facilitator) already had communication skills and were open for discussion. The facilitator should be the one I am comfortable to talk to and who gives positive advice and energy.

I 23: I faced a problem at the workplace. I couldn't talk to my professor. I talked to you (facilitator) and you advised me on how to deal and communicate and once I applied it, the result turned to be better.

I 3: The facilitator helped me in decision making by encouraging my confidence level from 50% to 100%.

I 32: Sometimes I had something to say but I forgot to make a point on it. The facilitator asked more questions to stimulate thinking.

I 38: The facilitator should have empathic listening and advisory skill. The facilitator could be anyone who has the required skills.

I 21: I also got new thinking from the facilitator's advice.

I 22: In four months of Cooperative Education, I think it was very useful that we had someone to guide and develop our positive thinking and prepare us for spending time in the workplace.

Three Co-op students mentioned the complement of the online reflective journal and the online group discussion in the intervention. In addition to the online reflective journal, the online group discussion would help Co-op students on their reflection and learning.

I 16: I think online group discussion was very useful and it was a must to have. Only writing might not be enough to express the feelings. It was good to have a session to talk where we could explain more. I learned about others' problems and new ways of thinking on how those did solve problems. I learned from it and used it whenever I faced similar problems.

I 18: Writing might not create the visualization and might mislead the true stories. The online group discussion allowed Co-op students to discuss and ask questions. When the facilitator asked questions, I tried to think and answer them.

I 19: The online group discussion was better than writing because we talked, asked questions, and got answers from the facilitator right away.

4.1.5.5 Intervention provided Co-op students the channel to release their stress and feelings that occurred in the workplace

As Co-op students were new to the workplace, they faced new challenging situations every day. Some Co-op students worked under pressure, and with stress the effectiveness of people was decreased. The intervention would help them

to deal with challenging situations. During the work session, Co-op students learned the topic called 'stress management' which provided concepts on how to deal with stress. The online reflective journal also helped Co-op students in venting their feelings and stress into writing and they could come back and reflect on their writing. The online group discussion was the effective channel for Co-op students to release their stress by sharing their experiences with peers and the facilitator. The excerpts are illustrated on the intervention as a channel to release Co-op students' stress and feelings.

I 5: I worked all day and felt tired. I opened the manual and looked at the topic on how to reduce stress. That made me feel better.

I 26: The online reflective journal was also the way to release workplace stress.

I 10: I vented the experiences or problems I faced. I exchanged new knowledge with friends since we worked in different companies and different kinds of job. I heard that one of our friends faced the same tough situation as I did.

I 28: Online group discussion allowed me to express and release my feelings and consult with the facilitator.

I 31: When someone let me down and I turned to having negative thinking, knowing that others were in the same shoes made me feel encouraged and powerful for overcoming the setback.

I 26: I think it (online group discussion) was very useful. When I listened to others' stories, my stories were no big deal. It taught me to be patient and face the problem easily.

I 29: It (the online reflective journal) helped to release stress and reminded me that I overcame this tough situation and should continue to find the solutions for coming problems.

In conclusion, the learning took place in all parts of intervention. The work session provided Co-op students with the new concepts of growth mindset and self-fulfilling prophecy which they applied in their online reflective journal and online group discussion. The Co-op students' mindset changed throughout the intervention. The work session equipped Co-op students with the mindset, skillset, and toolset. They applied those in their working life. The online reflective journal enhanced and encouraged Co-op students to overcome any setbacks. While the online group discussion was like the supported environment for them to vent or express their feeling, having the facilitator to help or provide advice, and learning from others' situations and perspectives. Co-op students found the overall intervention to be very practical, applicable, and useful so that they would recommend to implement it for all Cooperative Education. The integrated parts of intervention provided the flexible learning method which made intervention more interactive.

4.1.6 Co-op students' achievement of learning outcomes from Cooperative Education with intervention

This section presented Co-op students' achievements of learning outcomes from Cooperative Education with intervention. They are (1) Co-op students adopted the new mindset, skills, and competencies to foster their growth, (2) Co-op students learned to adapt themselves to others and the culture of the workplace and make necessary development, (3) Co-op students experienced the real job to develop their competence and employability, and (4) Co-op students learned from workplace

mentors and academic professors academically, professionally, personally, and psychologically.

4.1.6.1 Co-op students adopted the new mindset, skills, and competencies to foster their growth

Co-op students reflected upon themselves and know what they got from Cooperative Education. Co-op students experienced new knowledge, skills, and competencies such as being patient, hard-working, responsible, punctual, detail-oriented, open to others' ideas, and perseverance, problem solving, good communication, enthusiasm, skill development through project or assignment, working systematically, and setting clear goals. They shifted their mindset to be more open and positive. These enhanced them to think out of the box and be extraordinary. When there was immense work pressure and anxiety, Co-op students were aware and tended to seek feedback and improved themselves. They found out the value in themselves which made them feel confident, intelligent, and dare to make decisions. They noticed the growth in heart and mind. The excerpts show the learning outcomes of perceived new mindset, skills, and competencies by Co-op students.

I 16: I had a more positive mindset obviously, no more fixed mindset. I viewed things from different angles and became more flexible, which made me have a better relationship with others.

I 17: I see the value in me. I used to be a non-confident person. After the work session on growth mindset, I was aware of the effort so I set my clear goal and put my effort into achieving it. Even though I could not do it, I never gave up. I tried harder.

I 1: I am more responsible in work. I learned to be more patient to reach my goals.

I 22: Cooperative Education provided me the experiences in real the workplace, real situations. I set my clear goals and thrived.

I 23: I opened my mind toward work and people. I did not stick with my thinking and ideas. I listened to others.

I 25: I learned from criticism. I received feedback and improved myself by setting a goal and trying to achieve it.

I 36: I felt that I grew up in my thinking, became mature, developed the courage to make decisions, which was different from the original me. My professor also observed this change in me.

I 6: I improved my communication skill, showed more humility.

I 9: I changed my mindset. Everything, no matter how hard it is, I can do it. This reflects myself from inside so I had courage to start doing things. I considered that I am already successful.

4.1.6.2 Co-op students learned to adapt themselves to others and the culture of the workplace and make necessary development

Co-op students experienced building relationships with others and adapting themselves socially and with the culture in the working environment. They worked with others and faced challenging situations which enhanced them to choose the right mindset to cope with it. They learned from the success and experiences of colleagues, mentors, and managers in the organization. Cooperative Education gave them chances to adapt themselves to the new social environment which made them learn and grow. They accepted the different thinking of different people and became

open for new and different ideas. They could stand amidst conflict within the team which may be from different generations. The excerpts illustrate Co-op students' adaptation to others and the culture of the workplace.

I 1: I made connections with my senior colleagues. They led my thinking and were supportive in my work. They were very smart.

I 15: I learned from my seniors' experiences and advice.

I 22: I listened to my project colleagues more. I gained good advice from my Thai seniors.

I 24: I learned how to work with people of different generations. I tried to learn more on generation characters and personality so that I could adapt myself whenever I worked with them.

I 26: I worked with almost every department in the company. They were all different in working styles. I put my effort to understand them and find the right way to work with them. I learned to trust and distrust others.

I 32: I experienced working with different types of people and reflected upon myself.

I 9: I experienced the negative environment within the workplace. People here were creative and they reserved privacy so it was hard to get into them. They stayed in their zone.

4.1.6.3 Co-op students experienced the real job to develop their competence and employability

Co-op students understood more on their work which led to making the right career development and employability decisions. Co-op students faced real working experiences and challenging situations which were different from the

environment in university. They obtained the new knowledge, new learning through their assignments and projects. They used learning strategies such as planning, time management, organizing, teamwork, system management, and organizing to get the job done. They learned how to set goals and achieve them. Finally, they knew themselves what kinds of jobs suit them and how to find the path to achievement. The excerpts are gained experiences to develop their competence and employability.

I 13: I gained experiences which were much different from the classroom. I went out to see the working world.

I 14: I learned how to plan my life and prepare myself for new work.

I 22: I learned new things outside the academic world. I worked in real projects and environments and learned how to live my life.

I 23: In our classroom, we learned the knowledge with less practice. Cooperative Education provided me the practical work, the organization structure knowledge, the standard of procedure, etc., through projects.

I 26: I learned how to overcome the setbacks. The works were totally new to me since I never studied at university.

I 31: I did not work in the field of my study. I opened my mind to welcome new knowledge and adapt myself into it.

I 4: I learned lots of new things that I never studied at university. What I learned from the campus was not what I experienced in the workplace. It was theories versus practices.

I 5: I learned new field of study and I was happy to learn new things....

I 8: I knew how to set goals and put effort to achieve them.

I 9: I intentionally chose to work for an advertisement agency company which was not my field of study. I wanted to find myself as to whether I was into it or not. I was determined and kept doing what made me happy.

I 13: I knew more about myself before I started my career. I knew what kind of jobs suited me well. So I can make the best choice for myself.

4.1.6.4 Co-op students learned from workplace mentors and academic professors academically, professionally, personally, and psychologically

Interestingly, most Co-op students mentioned that support from their mentors was very important. With the good relationship and support from their mentors, Co-op students would achieve more. Their mentors mostly played the role of consultant and coach on daily works and projects. They supported Co-op students professionally, personally, and psychologically. The excerpts are Co-op students on support gained from their workplace mentors and academic professors.

I 33: I learned new skills, working life from my mentor. It was so different from what I was at university. I was so lucky that I worked with good colleagues and a good mentor who always gave advice and support.

I 36: I adapted myself to the working environment. I learned a lot from my mentor's success. I always had conversation with my mentor on his journey of success.

I 23: I have a very good relationship with my mentor. She is so generous.

I 1: My mentor coaches me on work and guides me on finding information for the project.

I 11: If there were any questions, I could call the responsible person of the project anytime for help.

I 12: I was so lucky that I had Mr. Oh as my mentor, consultant, coach, and shop manager. He always provided me the valuable advice.

I 22: My mentor took good care of me so there were no big problems. We worked like family.

I 6: My mentor closely coached me in every step of working. She gave me feedback and advised me promptly.

During Cooperative Education, Co-op students were supervised by their professors academically, especially on the project. Professors visited them on the working site once during four months of Cooperative Education to meet workplace mentors and advise students on their project progress and give feedback on students' behaviors and performance in the workplace. Professors provided support to Co-op students academically and psychologically. The excerpts illustrate Co-op students' opinions on their professors' support.

I 1: My professor gave me advice on my projects. Moreover, he helps me to search for necessary data to be used in the project since he knew that I do not have time to look for it.

I 10: She (my professor) got direct feedback from my mentor on my strengths and weaknesses and then she gave me feedback for further improvement. I was so excited when my professor visited me. I felt encouraged and motivated to work.

I 2: My professor visiting was very useful since I could consult on my project face to face. I wish that she could have stayed longer so that I would have had a clear plan on the project.

I 22: I work in Vietnam. I felt emotional when my professor visited me. She was like my parent who came to visit me and support me psychologically.

With the limited time to visit Co-op students, the effectiveness of the visits was decreased. There might be misunderstanding, leading to unfavorable situations as the following excerpts.

I 26: She (my professor) should listen to my facts rather than listen only from the workplace and take sides. I had problems with my colleagues and I wish my professor could have understood me.

There were two students who mentioned needing support from their professors on the appropriate assigned work that was not related to their field of study, as in the following excerpts.

I 29: I wish that my professor had helped me on considering the workload that was related to my study field and had provided feedback to the workplace.

Three students raised up the frequency of professor visits. They preferred to have the professor visit more than once so they could spend more time to consult on either project or work life. The excerpts show Co-op students' preference on the frequency of their professor visits.

I 24: I would prefer to have my professor visit at least twice, at the beginning and before completion of Cooperative Education. In the first two months, Co-op students needed support on their changing environment, and in the last two weeks support on the projects.

I 14: I wish my professor had visited me more than once. I needed more support from her when I faced problems.

I 12: I expected more from my professor on coaching. She could have helped me on problem solving on the project....

Overall, Co-op students found “what is in it for me” in their Cooperative Education. They knew their strengths, weaknesses, value, and skills. They also learned how to work and make relationships with others in the workplace and learned about work outside their campus experiences. Importantly, Co-op students could find their suitable career and increase their employability in the future. One of the important parts to support Co-op students was their mentor and professor who helped them academically, professionally, and psychologically.

4.2 The Effect of Growth Mindset and Self-Fulfilling Prophecy

Intervention on Co-op students’ Self-Efficacy

This section answers the research question ‘What effect does the growth mindset and self-fulfilling prophecy intervention have on Co-op students’ self-efficacy?’ There were two quantitative data analyses to show the effect of the growth mindset and self-fulfilling prophecy intervention. The first one is the difference of the mean scores of Co-op students’ self-efficacy pre-test and post-test. The second data analysis was the multiple regression of correlation between the independent variables and the dependent variables. To support the quantitative data results, the qualitative data received from the online reflective journal, online group discussion, and individual interview session was used. The following session described both the quantitative and the qualitative results on the self-efficacy.

4.2.1. The result of mean scores of Co-op students' self-efficacy

The pre-test of self-efficacy (27 questions) was distributed to both the 36 Co-op students from the control group and the 36 Co-op students from the experimental group prior to the Cooperative Education period. Then, the experimental group participated in the intervention – work session, online reflective journal, online group discussion, and individual interview session. After the end of the Cooperative Education period, the post-test self-efficacy was distributed to both the control group and the experimental group.

After the raw scores were collected, a paired-sample t-test was run on a sample of 36 Co-op students in the control group and a sample of 36 Co-op students in the experimental group to determine whether there was a statistically significant difference between the mean scores of self-efficacy before and after the Cooperative Education period.

Table 4.5 shows the result of the mean scores and paired-sample t-test that there is a statistically significant difference in Co-op students' self-efficacy of the experimental group. The control group pre-test mean scores ($\bar{x}=4.064$, $SD=0.402$) and post-test mean scores ($\bar{x}=4.080$, $SD=0.424$) were reported. While the experimental group pre-test mean scores ($\bar{x}=4.010$, $SD=0.258$) and post-test mean scores ($\bar{x}=4.255$, $SD=0.353$) were shown, the result indicates that the mean scores of the experimental group are statically significantly different ($t=-4.110$, $Sig=0.000$) and that there is no statistically significant difference ($t=-0.385$, $Sig=0.703$) in the control group. The result indicates that there is the effect of the intervention toward the Co-op students' self-efficacy.

Table 4.5 The mean scores and the two-tailed test of self-efficacy pre-test and post-test

	Test	n	Mean	S.D.	t	Sig
Control group	Pre-test	36	4.064	0.402	-0.385	0.703**
	Post-test	36	4.080	0.424		
Experimental Group	Pre-test	36	4.010	0.258	-4.110	0.000*
	Post-test	36	4.255	0.353		

Remark: * Significant Difference

** No Significant Difference

To elaborate on the effect of intervention on the variables toward Co-op students' self-efficacy, the 27 questions were grouped into nine aspects to see the effect from each of the variables. From 10 independent variables groups, five variables are from growth mindset and four variables are from self-fulfilling prophecy. The details of independent variables were (1) Embrace challenges, (2) Persist in the face of setbacks, (3) See the effort as the path of mastery, (4) Learn from criticism, (5) Find lessons and inspiration in the success of others, (6) Desired outcome, (7) Meet expectations, (8) Achievement and learning, and (9) Awareness to avoid negative action.

Table 4.6 Self-efficacy mean of each independent variable

Variables	Mean		S.D.		t		Sig	
	Cont.	Exp.	Cont.	Exp.	Cont.	Exp.	Cont.	Exp.
1) Embrace challenges	-.027	.222	.385	.516	-.433	-2.582	.668**	.014*

Table 4.6 Self-efficacy mean of each independent variable (continued)

Variables	Mean		S.D.		t		Sig	
	Cont.	Exp.	Cont.	Exp.	Cont.	Exp.	Cont.	Exp.
2) Persist in the face of setbacks	.018	.231	.251	.556	.442	-2.495	.661**	.017*
3) See effort as the path to mastery	-.027	.240	.332	.461	-.502	-3.127	.619**	.004*
4) Learn from criticism	-.009	.222	.439	.685	-.126	-1.945	.900**	.060*
5) Find lessons and inspiration in the success of others	.055	.138	.474	.542	.702	-1.536	.487**	.134
6) Desired outcome	-.074	.398	.414	.579	-1.071	-4.125	.291**	.000*
7) Meet expectations	.055	.222	.684	.897	.487	-1.485	.629**	.147* *
8) Achievement	.000	.208	.462	.613	.000	-2.036	1.00**	.049*

Table 4.6 Self-efficacy mean of each independent variable (continued)

Variables	Mean		S.D.		t		Sig	
	Cont.	Exp.	Cont.	Exp.	Cont.	Exp.	Cont.	Exp.
9) Awareness to avoid negative action	-.055	.305	.487	.409	-.683	-4.480	.499**	.000*

Remark: * Significant Difference

** No Significant Difference

Table 4.6 shows that there were no statistically significant difference in the control group in every independent variable. However, for the experimental group, there were two independent variables – ‘Find lessons and inspiration in the success of others’ and ‘Meet expectations’ – which reported no statistically significant difference. Eight other independent variables results were showed a statistically significant difference after the intervention. Even though these two independent variables, ‘Find lessons and inspiration in the success of others’ and ‘Meet expectations,’ may not show a statistically significant difference the mean scores of the experimental group was higher than the control group. This indicated that there was the effect from independent variables but as a small effect.

In this study, Co-op students in the experimental group were from different faculties: (1) the Faculty of Natural Resources and Agro Industry, (2) the Faculty of Science and Engineering, and (3) the Faculty of Liberal Arts and Management Science. To test the effect between each demographic group of Co-op

students in experimental group, the ANOVA was conducted. The result revealed that there is no statistically significant difference among the group. This implied that the effect of the intervention was valid no matter what the faculties of the students were. Therefore, the intervention can be used for all Cooperative Education students. The ANOVA result is illustrated in Table 4.7.

Table 4.7 ANOVA The mean scores of different faculties of Co-op students in experimental group

	Sum of Squares	df	Mean	F	Sig.
Between group	.516	2	.258	1.671	.204**
Within group	5.098	33	.154		
Total	5.615	35			

Remark: * Significant Difference

** No Significant Difference

The above mean scores different results were aligned with the results of students' learning records in the online reflective journal. During 14 weeks of Cooperative Education, 36 Co-op students recorded a total of 541 journal entries. Co-op students assessed themselves on the use of growth mindset and self-fulfilling prophecy. From Figure 4.6, the result shows that they experienced the most in Desired outcome (19%), Persist in the face of setbacks (17%), and See effort as the path to mastery (16%). This indicated that Co-op students experienced various situations which they learned either negatively or positively in the workplace.

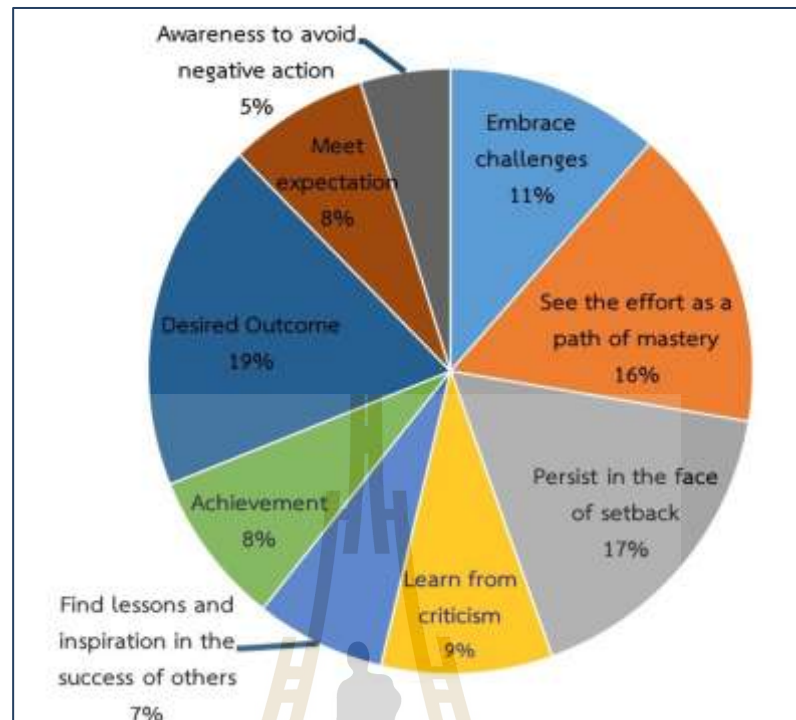


Figure 4.6 The frequency of using growth mindset and self-fulfilling prophecy

4.2.2 The result of correlation and multiple regression analysis

In this study, the correlation and multiple regression analyses were conducted to examine the relationship between self-efficacy and various potential predictors (independent variables). In this study, there are a total of nine potential predictors on self-efficacy, which are (1) Embrace challenges, (2) Persist in the face of setbacks, (3) See the effort as the path of mastery, (4) Learn from criticism, (5) Find lessons and inspiration in the success of others, (6) Desired outcome, (7) Meet expectations, (8) Achievement, and (9) Awareness to avoid negative action. The self-efficacy dependent variables have four aspects: (1) Goals, (2) Effort and persistence, (3) Learning and achievement, and (4) Activity selection. The analysis was conducted by using the raw scores of self-efficacy post-test and the frequency of coding from qualitative data of dependent variables by using the multiple linear regression analysis.

To see more of the individual effect from independent variables, the stepwise linear regression analysis was conducted. Moreover, the qualitative data from the online reflective journal, online group discussion and individual interview session were used to support the quantitative statistics. The content analysis was done and organized by using the NVIVO program.

The results show the detailed analysis on each dependent variable and the supportive data in the next section.

4.2.2.1 Result of multiple regression analysis of independent variables on Goals

The result of independent variables on Goals is shown in Table 4.8.

Table 4.8 Result of multiple regression on Goals

Variables	b	SEb	β	t	p-value
1) Embrace challenges	-4.317	6.638	-1.856	-.650	.521
2) Persist in the face of setbacks	-5.243	3.322	-2.264	-1.578	.126
3) See effort as the path to mastery	-.368	2.549	-.161	-.144	.886
4) Learn from criticism	.787	2.352	.326	.334	.741
5) Find lessons and inspiration in the success of others	1.055	2.566	.457	.411	.684
6) Desired outcome	1.050	2.814	.495	.373	.712
7) Meet expectations	-.001	1.699	-.001	-.001	.999
8) Achievement	7.240	5.329	3.075	1.359	.185

Table 4.8 Result of multiple regression on Goals (Continued)

Variables	b	SEb	β	T	P-value
9) Awareness to avoid negative action	1.927	2.785	.813	.692	.495
Constant ; SE _{est} = 5.00149					
R = 0.904; R ² = 0.817; F = 13.368; p-value = 0.000					

Table 4.8 summarizes the descriptive statistics and analysis results. The results reveal that there is no statistically significant correlation between variables and goals. The multiple regression with all nine variables produced R² = 0.817, F= 13.368, p<.001. The raw score model to compute the predicted scores is as the following equation.

$$\hat{Y} = -4.317X_1 - 5.243X_2 - 0.368X_3 + 0.787X_4 + 1.055X_5 + 1.055X_6 - 0.001X_7 + 7.240X_8 + 1.927X_9 \quad (4.1)$$

The standardized model can be used to make the predictions. The model is as the following equation.

$$\hat{Y} = -1.856Z_1 - 2.264Z_2 - 0.161Z_3 + 0.326Z_4 + 0.457Z_5 + 0.495Z_6 - 0.01Z_7 + 3.075Z_8 + 0.813Z_9 \quad (4.2)$$

Table 4.8 also shows the R² (Coefficient of determination) = 0.817 indicating that all nine variables can predict Goals at 81.7% with Standard error of the estimate = 5.00149.

Stepwise linear regression analysis was also conducted. The result of stepwise analysis is shown in Table 4.9.

Table 4.9 The result of stepwise linear on Goals

Variables	B	SE _b	β	t	p-value
8) Achievement	2.086	.184	.886	11.316	.000

Constant; SE_{est} = 4.75402

R = 0.888; R² = 0.785; F = 128.048; p-value = 0.000

From Table 4.9, the stepwise linear regression analysis was conducted. The result shows that the **Achievement** is positively and significantly correlated with Goals, indicating that more achievement tends to reflect higher in Goals. The raw score model to compute the predicted scores is as the following equation.

$$\hat{Y} = 2.086X_9 \quad (4.3)$$

The standardized model can be used to make the predictions. The model is as the following equation.

$$\hat{Y} = 0.886Z_9 \quad (4.4)$$

Table 4.9 also shows the R² (Coefficient of determination) = 0.785, indicating that the Achievement can predict Goals at 78.5% with Standard error of the estimate = 4.75402.

To support the quantitative result on goals, Co-op students mentioned their Achievement through their goals and ways to achieve them. They set very high challenging goals. Once they were assigned to do the challenging jobs, they put high effort and dedication into it. They worked very hard and did their best by seeking criticism to improve themselves. The more effort and persistence they put into their work, the more achievement they got. The excerpts illustrate Co-op students' achievements through their goals.

I 13: I had achieved the highest booking from walk-in customers.

I 16: I had the opportunity to work on an important project as game page administrator which had about 3 million members. I had access to all data and information of this page which were quite confidential. I had set goals to get employment after my Cooperative Education period and I have already achieved it.

I 38: I had set a goal to finish the project within one month so I planned all the work, pinned milestones, started doing, and planned for the next step. Finally, I finished my project as planned.

I 8: I used a growth mindset in setting goals and took in all feedback and criticism to improve myself. I participated in the product launch event. I was a part of this event and that made me face new challenges and experiences. I was so excited to join this event.

I 21: I had courage in setting my goal. Previously, I think I was an effortless person. Now I believe that effort is worth it and pays off. So I tried hard and achieved my goal.

I 18: I set goal to be good food scientist. The ways to get there included to gain knowledge, study more, and apply all knowledge in work.

I 21: I reviewed my goal in participating in the Cooperative Education program. My initial goal was communication skill. I am introverted person so I tried to practice communicating at work at my comfortable level.

I 32: I was assigned to do the document work which I was not keen on. At first, I was reluctant to ask for advice from my manager. Then, after I thought about the growth mindset in that I face the challenging situation and have to achieve the goal, I clarified expectations with my manager and finished it within the next week.

4.2.2.2 Result of multiple regression analysis of independent variables on Effort and persistence

The result of independent variables on Effort and persistence is shown in Table 4.10.

Table 4.10 Result of multiple regression on Effort and persistence

Variables	b	SE _b	β	t	p-value
1) Embrace challenges	1.156	9.263	.277	.125	.902
2) Persist in the face of setbacks	-7.269	4.636	-1.750	-1.568	.129
3) See effort as the path to mastery	1.211	3.557	.295	.341	.736
4) Learn from criticism	4.193	3.282	.969	1.278	.212
5) Find lessons and inspiration in the success of others	.606	3.581	.146	.169	.867
6) Desired outcome	2.996	3.927	.787	.763	.452
7) Meet expectations	.474	2.371	.112	.200	.843
8) Achievement	-1.537	7.436	-.364	-.207	.838
9) Awareness to avoid negative action	1.974	3.887	.465	.508	.616

Constant; SE_{est} = 6.97993

$$R = 0.943; R^2 = 0.889; F = 24.035; p\text{-value} = 0.000$$

Table 4.10 summarizes the descriptive statistics and analysis results. The results reveal that there is no statistically significant correlation between variables and effort and persistence. The multiple regression with all nine variables

produced $R^2 = 0.889$, $F = 24.035$, $p < .001$. The raw score model to compute the predicted scores is as the following equation.

$$\hat{Y} = 1.156X_1 - 7.269X_2 + 1.211X_3 + 4.193X_4 + 0.606X_5 + 2.996X_6 + 0.474X_7 - 1.537X_8 + 1.974X_9 \quad (4.5)$$

The standardized model can be used to make the predictions. The model is as the following equation.

$$\hat{Y} = 0.277Z_1 - 1.750Z_2 + 0.295Z_3 + 0.969Z_4 + 0.146Z_5 + 0.787Z_6 + 0.112Z_7 - 0.364Z_8 + 0.465Z_9 \quad (4.6)$$

Table 4.10 also shows the R^2 (Coefficient of determination) = 0.889 indicating that all nine variables can predict Effort and persistence at 88.9% with Standard error of the estimate = 6.97993.

Stepwise linear regression analysis was also conducted. The result of stepwise analysis is shown in Table 4.11.

Table 4.11 The result of stepwise linear on Effort and persistence

Variable	b	SE _b	β	t	p-value
6) Desired outcome	3.557	.230	.934	15.494	.000
Constant; SE _{est} = 6.56424					
$R = 0.934$; $R^2 = 0.873$; $F = 128.048$; $p\text{-value} = 0.000$					

From Table 4.11, the stepwise linear regression analysis was conducted. The result shows that the **Desired** outcome is positively and significantly correlated with Effort and persistence, indicating that more Desired outcome tends to reflect higher in Effort and persistence. The raw score model to compute the predicted scores is as the following equation.

$$\hat{Y} = 3.557X_7 \quad (4.7)$$

The standardized model can be used to make the predictions. The model is as the following equation.

$$\hat{Y}=0.934Z_7 \quad (4.8)$$

Table 4.11 also shows the R² (Coefficient of determination) = 0.873 indicating that the desired outcome can predict Effort and persistence at 87.3% with Standard error of the estimate = 6.56424.

To elaborate on how desired outcome could predict Effort and persistence, Co-op students mentioned their new learning, new skills, and the new experiences from their workplace. They learned about the culture within workplaces and how to work as a team. The workplace also provided them with various and different experiences from the campus. With new experiences, Co-op students demonstrated their effort to master the work as well as the persistence to overcome any setbacks. The excerpts are the Co-op students' desired outcome resulting from their effort and persistence.

I 11: I learned that working together, everyone needed to adapt to one another. I could see the difference in the thinking of each team. When we do the big project, collaboration is necessary by helping one another to move forward, gathering knowledge and unleashing team potential.

I 14: I experienced the under pressure situation and how to deal with it. I planned my daily work and learned to work with others. I found that working with others was not that difficult.

I 15: I had opportunities to do various tasks within three months such as creative work, video making, design work, and document work. I viewed all as experiences that I could apply. Since I changed to a more positive mindset, I have new

thinking and ideas. I opened more to new things. Even though I felt tired, I enjoyed it. Consequently, I was assigned to do the important works.

I 38: The first week that I worked in the production department, I started with learning the process of ethanol production. I had no knowledge about this process. I learned and tried to remember the process the whole week.

I 15: I used to think that what we have learned from university could be applied in work but it was just a little piece. There were many more details during the work process. I was afraid that I didn't prepare well.

I 30: The systems in plant were different from what we had learned. The plant systems were broader and bigger. When I faced new challenges outside classroom knowledge, I was motivated and well-prepared for working. I also improved myself to be punctual and responsible.

I 18: I found out that there were more principles outside our lessons which are necessary for a food scientist to know and be aware of. In our real life, I felt nervous since within the situation, there were more details and caution points.

I 29: As I worked in a field that did not match with my major, I had no skills. I had to spend much time on understanding and learning the works. I observed and finished the assigned work.

4.2.2.3 Result of multiple regression analysis of independent variables on Learning and achievement

The result of independent variables on **Learning and achievement** is shown in Table 4.12.

Correlation and multiple regression analyses were conducted to examine the relationship between self-efficacy and various potential predictors (independent variables). The result is shown in Table 4.12.

Table 4.12 Result of multiple regression on Learning and achievement

Variables	b	SE _b	β	t	p-value
1) Embrace challenges	-6.177	8.841	-1.340	-.699	.491
2) Persist in the face of setbacks	-.562	4.425	-.122	-.127	.900
3) See effort as the path to mastery	-.502	3.394	-.111	-.148	.883
4) Learn from criticism	-.743	3.132	-.155	-.237	.814
5) Find lessons and inspiration in the success of others	-.121	3.418	-.026	-.035	.972
6) Desired outcome	7.894	3.748	1.876	2.106	.045
7) Meet expectations	-.557	2.263	-.119	-.246	.807
8) Achievement	7.961	7.097	1.706	1.122	.272
9) Awareness to avoid negative action	-3.558	3.710	-.758	-.959	.346

Constant; SE_{est} = 6.66125

R = 0.917; R² = 0.890; F = 33.321; p-value = 0.000

Table 4.12 summarizes the descriptive statistics and analysis results. The results reveal that the **Desired outcome** is statistically significant and positively correlated with Learning and achievement. The multiple regression with all nine variables produced R² = 0.890, F = 33.321, p < .001. The raw score model to compute the predicted scores as the following equation.

$$\hat{Y} = -6.177X_1 - 0.562X_2 - 0.502X_3 - 0.743X_4 - 0.121X_5 + 7.894X_6 - 0.557X_7 + 7.961X_8 - 3.558X_9 \quad (4.9)$$

The standardized model can be used to make the predictions. The model is as the following equation.

$$\hat{Y} = -1.340Z_1 - 0.122Z_2 - 0.111Z_3 - 0.155Z_4 - 0.026Z_5 + 1.876Z_6 - 0.119Z_7 + 1.706Z_8 - 0.758Z_9 \quad (4.10)$$

Table 4.12 also shows the R² (Coefficient of determination) = 0.890 indicating that all nine variables can predict Learning and achievement at 89.0% with Standard error of the estimate = 6.66125.

Stepwise linear regression analysis was also conducted. The result of stepwise analysis is shown in Table 4.13.

Table 4.13 The result of stepwise linear on Learning and achievement

Variable	b	SE _b	B	t	p-value
6) Desired outcome	4.008	.216	.953	18.558	.000

Constant; SE_{est} = 6.17534

R = 0.953; R² = 0.908; F = 344.417; p-value = 0.000

From Table 4.13, the stepwise linear regression analysis was conducted. The result shows that the **Desired outcome** is positively and significantly correlated with learning and achievement, indicating that more Desired outcome tends to reflect higher in Learning and achievement. The raw score model to compute the predicted scores is as following equation.

$$\hat{Y} = 4.008X_7 \quad (4.11)$$

The standardized model can be used to make the predictions. The model is as the following equation.

$$\hat{Y}=0.953Z_7 \quad (4.12)$$

Table 4.13 also shows the R² (Coefficient of determination) = 0.953 indicating that the Desired outcome can predict Learning and achievement at 95.3% with Standard error of the estimate = 6.17534.

Certainly many Co-op students mentioned their new learning in the workplace. Most of them were the new knowledge and skills that were apart from academic knowledge in university. They experienced the ‘working life’ and learned more necessary equipment and tools in the workplace. The excerpts show the desired outcome effects of their learning and achievement.

I 22: I learned new things that I didn't learn in the classroom. I learned about the quality audit process, and how to control and be the auditor.

I 9: There was much more than what we learned. I could use only about 10% in real work. I learned all new things.

I 24: My work in the laboratory was different from what we learned from university. The equipment and tools were not alike. Studying and working are so different. You gain a different feeling.

I 6: I understood what is ‘working’? For example, you can hand in a paper late at university but you cannot delay work at the workplace.

Moreover, Co-op students learned about their job deeper and realized what kind of job they are looking for. Cooperative Education also provided them the opportunity on employability. Six Co-op students were offered to apply for the job after finishing their Cooperative Education. The excerpts illustrate Co-op students’ career development and employability.

I 13: I realized that I didn't like this kind of job. Initially, I thought I liked this job but it turned out that I can do it, not like it.

I 34: I found what job I would like to do. I worked here as support user helping the user in fixing problems. I would like to invent something new or invent new products not fix the product.

I 12: I know now what I like. I love being a technician rather than a marketing job.

I 36: I used to do internship in QA. I was not sure whether I liked it or not, so I applied for Cooperative Education. I set the goal to know what I like or don't like. I had opportunities to do various kinds of work and I learned what kind of job I had fun with it. Whichever works I enjoyed, I wanted to do more.

4.2.2.4 Result of multiple regression analysis of independent variables on Activity selection

The result of independent variables on Activity selection is shown in Table 4.14.

Correlation and multiple regression analyses were conducted to examine the relationship between self-efficacy and various potential predictors (independent variables). The result is shown in Table 4.14.

Table 4.14 Result of multiple regression on Activity selection

Variables	b	SE _b	β	t	p-value
1) Embrace challenges	4.765	7.163	1.711	.665	.512
2) Persist in the face of setbacks	-9.970	3.585	-3.596	-2.781	.010
3) See effort as the path to mastery	-.385	2.750	-.140	-.140	.890
4) Learn from criticism	1.986	2.538	.687	.783	.441
5) Find lessons and inspiration in the success of others	-.653	2.769	-.236	-.236	.815
6) Desired outcome	1.617	3.037	.636	.533	.599
7) Meet expectations	1.963	1.833	.696	1.071	.294
8) Achievement	-1.169	5.750	-.415	-.203	.840
9) Awareness to avoid negative action	4.375	3.006	1.542	1.455	.157
Constant; SE _{est} = 5.39716					
R = 0.923; R ² = 0.851; F = 17.148; p-value = 0.000					

Table 4.14 summarizes the descriptive statistics and analysis results. The results reveal that the Persist in the face of setbacks is statistically significant and negatively correlated with Activity selection. The multiple regression with all nine variables produced R² = 0.851, F = 17.148, p < .001. The raw score model to compute the predicted scores is as the following equation.

$$\hat{Y} = 4.765X_1 - 9.970X_2 - 0.385X_3 + 1.986X_4 - 0.653X_5 + 1.617X_6 + 1.963X_7 - 1.169X_8 + 4.375X_9 \quad (4.13)$$

The standardized model can be used to make the predictions. The model is as the following equation.

$$\hat{Y}=1.711Z_1-3.596Z_2-0.140Z_3+0.687Z_4-0.236Z_5+0.636Z_6+0.696Z_7-0.415Z_8+1.542Z_9 \quad (4.14)$$

Table 4.14 also shows the R² (Coefficient of determination) = 0.851 indicating that all nine variables can predict Activity selection at 85.1% with Standard error of the estimate = 5.39716.

Stepwise linear regression analysis was also conducted. The result of stepwise analysis is shown in Table 4.15.

Table 4.15 The result of stepwise linear on Activity selection

Variables	b	SE _b	β	t	p-value
2) Persist in the face of setbacks	-5.134	1.989	-1.852	-2.581	.014
9) Awareness to avoid negative action	7.733	2.034	2.727	3.801	.001
Constant; SE _{est} = 5.31423					
R = 0.905; R ² = 0.818; F = 6.664; p-value = 0.000					

From Table 4.15, the stepwise linear regression analysis was conducted. The result shows that **the Awareness to avoid negative action** is positively and significantly correlated with Activity selection, indicating that more Awareness to avoid negative action tends to reflect higher in Activity selection. **The Persist in the face of setbacks** is negatively and significantly correlated with Activity selection, indicating that more Persistence in the face of setbacks tends to reflect less in Activity selection. The raw score model to compute the predicted scores is as the following equation.

$$\hat{Y} = -5.134X_7 + 7.733X_{10} \quad (4.15)$$

The standardized model can be used to make the predictions. The model is as following equation.

$$\hat{Y} = -1.852Z_7 + 2.727Z_{10} \quad (4.16)$$

Table 4.15 also shows the R² (Coefficient of determination) = 0.818 indicating that the Persist in the face of setbacks and the Awareness to avoid negative action can predict Activity selection at 81.8% with Standard error of the estimate = 5.31423.

Obviously, having an awareness of avoiding negative actions can predict the Activity selection so Co-op students could choose their action to create the positive action amidst stress or setbacks. Co-op students had awareness both in work and the personal life. They reflected on themselves and understand their strengths and weaknesses. They adapted themselves and changed their actions as appropriate. Once they felt stress, they all knew what would be the impact and they could chose to respond in more effective way. The excerpts show Co-op students' awareness on their activity selection.

I 21: I worked very quietly on that day and I felt anxiety about how others think about me. I felt stress. At the end of the day, I reflected upon myself and I thought I have to move on. The next day, I tried to make relationships with others, and the situation got better. The anxiety and stress were from my thoughts.

I 9: I had the chance to interview one of the media staff. I learned a lot from him on how to make life worthwhile. We should just make the best day for ourselves and others in daily life. His interview changed my mindset. When my mindset

changed, I saw more alternatives lined up ahead. I had to take risk to learn new things. It was about 'mindset'.

I 3: When I tried to build a growth mindset for myself, it made me more positive thinking. I didn't feel bias with anyone or blame myself as worthless.

I 21: I stopped thinking bad about myself. I don't judge my value by appearance. I could contribute to others that made me see my own value.

While the statistics in the Persist in the face of setbacks show negative prediction on the Activity selection, the more that Co-op students persisted in the face of setbacks, the more pressure occurred and led to less selection of activities. Co-op students might practice more in persistence when they repeatedly fail; otherwise the setbacks could hold them down. Even though students mentioned that they persisted in the face of setbacks, noticeably, their non-verbal language was shown in negative emotional voices. The excerpts show the situation that Co-op students tried hard to be persistent in the face of setbacks.

I 23: In my project, I tested three samples and the first time failed. The outcome was not as my expectation. I had to do it again four times. There were many obstacles and I was not ready for it. I learned that I had to persist more and repeat the test more than two times till the test was satisfied.

I 27: I had communication problems with the researcher. I had to ask questions to clarify their expectations and details. I kept asking them whenever I came to not understand because I would like to meet their expectations.

I 29: I worked in the HR team which was not my field of study. There was no one to teach or mentor me. I had to learn everything by myself. I was assigned to do the job but I didn't know how to do it. So I asked others' managers in

another department who were willing to help and teach me the work. I think this situation was both setbacks and opportunity. If I could overcome these setbacks, I believe that I will be stronger.

I 30: I was blamed by a manager on not being able to answer his technical questions. I felt sad and cried inside. Then, my thought was that I have to find information and not to waste time blaming myself. So I searched for information to answer him. Another day, the problem still came up so I analyzed the problem again and tried to solve it but my solution didn't work.

I 36: I was assigned to do a new computer programming language. I started with no knowledge about it but I kept learning, solving problems. It took time till I felt tired. I did try many times but couldn't work. So I went out of the office.

I 21: Normally, I felt frustrated when I did any mistakes. I felt down about myself. Today, I made mistakes, I changed my thinking that mistakes could happen, and just learned from it.

In conclusion, there were a total of four independent variables (Achievement, Desired outcome, Awareness to avoid negative action, and Persist in the face of setbacks) that could predict the dependent variables (Goals, Effort and persistence, Learning and achievement, and Activity selection). The supportive qualitative data shows how those independent variables can predict the dependent variables effectively. The excerpts showed Co-op students' achievement through their goals, Co-op students' desired outcome leading to their effort and persistence, that desired outcome effects their learning and achievement, Co-op students' career development and employability, Co-op students' awareness on their activity selection, and that Co-op students tried hard to persist in the face of setbacks.

4.2.2.5 The effect of the non-correlation growth mindset and self-fulfilling variables on Co-op students' self-efficacy

Even though some of the independent variables (Embrace challenges, See the effort as the path to mastery, Learn from criticism, Find lessons and inspiration in the success of others, and Meet others expectations) might not be able to significantly predict each dependent variable statistically, the qualitative data showed the relation of independent variables through Co-op students learning outcomes. The details of each non-correlation growth mindset and self-fulfilling variables are illustrated as follows.

1) Embrace challenges

Co-op students were new to the workplace and real jobs. They were assigned with the new challenging tasks. With the growth mindset concept, they accepted the challenging situations easily. They embraced challenges and tried very hard to find the way to work it out. They viewed the challenges as their new learning so they welcomed new works and achieved them. Co-op students grew from the failures and learnings. The excerpts illustrate the situations they faced and embraced.

I 1: The soil in the farm was so hard and not suitable for planting. My friend and I discussed how to improve it. It might take time since the farmer never maintained the nutrition of the soil. They used chemical fertilization rather than an organic one.

I 11: I was so excited when I was assigned to join the team as organizer. I had the chance to propose the way to do LIVE for the meeting without any equipment. I used my phone to do it and the result came out satisfactory.

I 12: I was assigned to present products urgently. I had no time to prepare. However, I made it on that day.

I 16: I always welcomed new jobs. Initially, I was worried but later I enjoyed doing it and developed my thinking. I was assigned to administrate the 3-million liked page which was full of information. My mentor trusted me to do it even though I was just a Co-op student.

I 19: I worked in Vietnam. The big challenge was about the language. As we couldn't communicate, I had to observe from what they asked and followed them. I showed them how to do it and they would follow.

I 21: There was a fire at the retort process. I informed the related manager to put out the fire. In the challenging situation, everyone was shocked. I learned to have high consciousness in the emergency situation.

I 25: My manager was on duty in China. He delegated his work to me. I had to train a newly hired employee on the process.

I 29: I worked in HR which was not my field of study. I did all documents work. As my mentor never taught me how to do it, I had to learn by myself. Later, my manager resigned and I had to take care of all of the HR work.

I 33: There was an audit happening. I was assigned to take care of one test which required speed. I had to prepare myself in answering questions. I learned all of the information so that I could answer the audit committee.

I 37: I worked as project engineer. Initially, I didn't understand the production process so I learned by asking line staffs. They always said that I had a higher education than them. I changed their mindset that they were the expert in his area. I asked them to teach me.

I 7: My project was challenging. I did the experiment in planting corn comparing two methods. I monitored all the factors. The most challenging was to harvest at the right time.

I 9: I was assigned to write the content for a real customer. My mentor evaluated me on whether I could do this kind of work or not. Another challenge was to write the interview script and implement it.

2) Persist in the face of setbacks

When Co-op students encountered the setbacks, they persisted and found new ways to overcome. No matter how difficult the problems were, with the growth mindset, Co-op students never gave up and tried hard to find the best solutions. Finally, their efforts paid off with success. The excerpt situations illustrate how Co-op students persisted in the face of setbacks.

I 11: The system for company communication with upcountry staff was down. I proposed to do the LIVE broadcast so that the upcountry staffs could join the kick-off session.

I 14: I was assigned to present company products urgently. I had no time to prepare it. So, I did try my best in searching for information. I thought about growth mindset in which I had to persist in the face of setbacks.

I 12: I faced continued problems of the LIVE system on camera, sound, and shortcoming of products. I solved problems all the time. Then, I tried to set the stable system so that anyone can control and the system ran automatically.

I 21: This week, I faced the problem of taking the wrong samples for the laboratory. I had to solve problems to deal with it. I sought out the

cause of the problems and asked myself what I could do in this case.

I 22: I worked in Vietnam. My challenge was the language as the line staffs couldn't speak English at all. I tried to open up and talk to them, trying to ask them even though they looked quite serious. I tried to use non-verbal language to learn from them. Later, the atmosphere was better. They smiled and tried hard to communicate to us. I knew that my persistence had paid off. I tried more to build a relationship with them.

I 28: The testing machine was down so I had to throw away the test samples. I solved the problem by freezing the samples at 0 degrees Celsius rather than 4 degrees Celsius to keep the samples effective.

I 38: I faced a problem on my project timeline. There was a lack of some equipment to test. I thought that I could not finish by the set timeline so I did a contingency plan by doing another short-period project instead.

I 19: The products were rejected due to metal contamination. My solution was to closely monitor work process and line staff behaviors. Initially, line staffs did not cooperate with my solution. I tried again until they changed their ways of working. However, that was not sustainable, as they did the previous process again. I felt tired but I did not give up. I tried hard and finally it worked.

3) See effort as the path to mastery

Co-op students faced the assignment on certain tasks that they never did before. The belief in putting effort into their tasks helped them to be more skillful and achieve mastery of it. They envisaged that practice made perfect so they put their effort physically and mentally into mastering what they did. The excerpts illustrate how Co-op students put effort into their work to master it.

I 13: I was assigned to make phone calls to 160 customers to invite them to our company event. I finished the assignment within three days. On the first day, I made only 20 lines and I did better on the second day and did all on the third day. I put more effort into finishing it and the more I did, the faster I became.

I 16: Even though I did the repetitive jobs, I could make it faster and more relaxing. I could adapt myself well and get used to my jobs.

I 17: I did the test faster when I mastered it. Previously, I could do only two samples a day. With practice, I did three samples a day.

I 30: I put lots of effort into practicing my works. I did it until I got used to it. Like learning English language, I took notes and reviewed so that I could respond to my manager's request anytime he wanted. I believe in practicing.

I 38: At first, I felt that I couldn't do it since it was not my field of study. I put my effort into doing it and if I couldn't do it I told myself that I have not YET done it. Little by little with learning from my manager, I would be able to do it.

I 14: I always seek for new adaption and the best method to make me master on it.

I 27: There was a new machine installed at the company. No one mastered in using it. I learned to master it by reading a manual, asking for advice from a researcher, and listening to sales training.

I 28: I did the new test to collect parameter data. I obtained new knowledge and mastered the test with repetition.

I 32: I thought the program was difficult for me and I didn't know how to use it. I recalled the growth mindset that this is challenging work. I can do it and master it with practice.

I 36: I was assigned to install a program on the computer. Initially, I could not do it so I tried repeating till I reached mastery. Practice and repetition can unleash potential. I can remember more and work more professionally.

I 7: I worked on a farm. My job was to breed plants, monitor the growth rate, and check the products. All of these jobs require the mastery to do them so I had to practice more and then I spent less time on the second day.

4) Learn from criticism

Co-op students were open to getting both reinforcement and redirect feedback to continue their behaviors and improve themselves. The criticism from others increased Co-op students' awareness on their behaviors and clarified others' expectations on work and behaviors. The following excerpts present the situations from which Co-op students took criticism for their betterment.

I 12: I got feedback on my project from my professor. I had to change the measurement platform from WordPress to website.

I 13: I got criticism from my mentor that I should double-check the work before sending it off. I learned that I needed to focus more on details even though it was urgent.

I 25: I got feedback along the way. I viewed it as very useful. I had to improve myself.

I 30: After I was blamed by a manager from the production department, I took that criticism and found more knowledge to achieve the solution. I also asked my mentor to provide me with feedback on my work.

I 37: After I handed the work to my mentor, she noticed that I felt stressed. She gave me feedback that I needed to be more relaxed to get new ideas.

I reflected upon myself that I needed to see the many angles and find more information. My mentor told me to have more self-confidence and then I would have more courage to express my ideas. One more feedback was that I needed more planning and prioritizing of work.

I 9: Initially, I felt discouraged when I received criticism. Growth mindset helped me to open for feedback and talk to myself. I accepted the feedback and developed myself for the better.

I 25: I worked on routine work and two projects. Whenever there were problems, I had to make decisions to solve them. As not every decision that I had made was a good one, I needed feedback from my mentor and others. This made my work better and there were various solutions coming out.

5) Find lessons and inspiration in the success of others

Co-op students were inspired and motivated from surrounding people in the workplace such as mentors, managers, and colleagues. They considered the success of others as the source of positive influence on their goals. They learned how those people were successful and encouraged themselves to find paths to their success. The following excerpts are Co-op students' examples on finding lessons and inspiration in the success of others.

I 12: I viewed my mentor as my role model. He is very friendly and has a good relationship with others especially customers. He always shared a positive attitude and mindset. I was so happy to have him as my mentor.

I 15: I had learned from sales representatives on how they opened the sales talk to customers. I also asked them how to start before I tried to talk to customers myself.

I 21: I found lessons and inspiration in the success of one of my friends who did the presentation in the seminar. She received praise from the professor. I think that I also can do it and will put in more effort when it is my turn.

I 25: I got inspiration from the researcher and the doctor at the research center. I would like to be as successful as them. I learned the new technique and tools from the expert and keep it as my experiences.

I 4: I worked for a company whose owner is a professor. There were many experienced high-ranked professors in the company. They are experts in different certain areas. I learned their knowledge and was inspired by their success.

I 19: I had the chance to interview a famous writer/chief editor. I learned mindset and attitude from him. I had a broader view in seeing things. He had a positive attitude.

I 18: I was inspired by managers at the company. Some of them started working as a daily-wage worker and developed themselves to be managers. Some of them didn't have the education degree. They inspired me that one day I can be successful like them.

I 21: I worked in a laboratory and did repetitive work. One day, my friend did one step in a different way which was faster than the way I did. From a growth mindset, I admired her and learned from her. I didn't feel threatened but I learned something new. I was pleased with my friend's success and motivated to get better.

6) Meet others' expectations

When Co-op students were assigned to do the job from their mentors, they tended to perform in such a way that they could achieve it. Co-op students

set the clear and realistic expectations with their mentors. The more important the assigned work from mentors, the harder Co-op students worked to achieve it since they liked being trusted. The excerpts illustrate that Co-op students had clear goals and achieved them.

I 16: I was assigned to do the challenging task of giving a brief to other departments. I never did this kind of work before. My manager trusted me to do this job. I enjoyed doing it and I sought the way to finish it.

I 30: I expected to help to develop the plant. So I had to learn new things, do planning, prepare knowledge, and read books. I had to prepare myself every day to meet the expectations of my managers.

I 9: I had to meet others' expectations by doing the best that I can. I had to do more. For example, I had to spend four days on transcribing the interview record. It was challenging and this work was not like an assignment at university.

I 10: Whenever I was assigned to do tasks, I asked for the expectations to avoid any misunderstanding. Then I could propose to my manager on developing a new and easy system.

I 22: I was assigned to learn about the sterilization process. There were some contents that I didn't understand so I tried to do self-study by seeking information from the internet such as food law, calculation, and tools. I could use this knowledge in future assigned works by my mentor.

I 37: I was asked by my mentor to design a tool as a defect detector. I spent two days to do it. I handed over the work and couldn't meet my

mentor's expectations so I clarified expectations and asked for his advice. I sought more information in books and online to find aspiration and design it again.

The effect of the non-correlation growth mindset and self-fulfilling variables on Co-op students' self-efficacy was shown in qualitative data as (1) Co-op students faced the challenging situations and embraced them, (2) Co-op students persisted in the face of setbacks, (3) Co-op students put effort in their work to achieve mastery of it, (4) Co-op students took the criticism for their betterment, (5) Co-op students found lessons and inspiration in the success of others, and (6) Co-op students had clear goals and achieved them.

4.3 Summary of Findings

The findings in this chapter were the design and development of intervention and the effect of intervention on Co-op students' self-efficacy. The growth mindset and self-fulfilling prophecy intervention were designed based on the instructional design ADDIE. The intervention consisted of four parts: (1) work session, (2) online reflective journal, (3) online group discussion, and (4) individual interview session. Co-op students who participated in this intervention revealed that the intervention was very positive and useful. They would recommend the intervention to be implemented for Cooperative Education students. The effect of intervention on Co-op students' self-efficacy was shown in the results of the quantitative data of the differences of mean scores of pre-test and post-test self-efficacy. There were statistically significant differences in the mean scores of Co-op students' self-efficacy. Moreover, the ANOVA results showed that there was no difference between faculties. This implied that the intervention was suitable to use for Co-op students.

In addition, the multiple regression analysis was conducted to see whether the independent variables were able to predict the dependent variables. The results (Figure 4.7) showed that there were four independent variables (Achievement, Desired outcome, Awareness to avoid negative action, and Persist in the face of setbacks) that could predict the dependent variables (Goals, Effort and persistence, Learning achievement, and Activity selection). Even though not all independent variables could predict the dependent variables, there were valid qualitative data to support the effect on self-efficacy. The qualitative data on Co-op students' learning outcomes from Cooperative Education were (1) Co-op students adopted the new mindset, skills, competencies to foster their growth, (2) Co-op students learned to adapt themselves to others and the culture of the workplace and to make necessary development, (3) Co-op students experienced the real job to develop their competence and employability, and (4) Co-op students gained support from workplace mentors and academic professors academically, professionally, personally and psychologically. Importantly, Co-op students viewed that the support from coaches, mentors and professors was vital for their learnings from Cooperative Education. In addition, Co-op students expressed their positive attitude toward overall intervention as (1) intervention enabled Co-op students to shift their mindset to a growth mindset and have positive thinking, (2) Co-op students could apply their learnings from the work session in the workplace, (3) the intervention encouraged Co-op students on self-reflection and learning, (4) Co-op students learned from their friends and facilitators during the work session and online group discussion in the intervention process, and (5) intervention provided Co-op students the channel to release their stress and feelings occurred in workplace.



Figure 4.7 The result of stepwise linear progression analysis



CHAPTER 5

CONCLUSIONS AND DISCUSSION

The final chapter summarizes the research study and its findings. The discussion on the findings is conducted, and the implications of growth mindset and self-fulfilling prophecy intervention are presented. The last part is the limitations of the study and the recommendations for future research.

5.1 Summary of the Study

Under the belief in the principle of Cooperative Education which promotes the integration of Co-op students learning between on-campus and the workplace through experiential learning, Co-op students with self-efficacy tend to learn more and achieve their set goals. The researcher aimed to find the right way to enhance Co-op students' self-efficacy. After the rigorous literatures review, this study was to examine the effect of growth mindset and self-fulfilling prophecy intervention on self-efficacy of Cooperative Education.

The objectives of the present study were mainly (1) To design and develop the growth mindset and self-fulfilling prophecy intervention to enhance Cooperative Education students' self-efficacy and (2) To investigate the effects of the growth mindset and self-fulfilling prophecy intervention on Cooperative Education students' self-efficacy. The present study used the mixed method with quasi-experimental research design with both the control group and the experiment group. The experimental group was treated to the intervention during their Cooperative Education period, December 2018 – April 2019. The intervention process was (1) the 8-hour work

session of growth mindset and self-fulfilling prophecy, (2) the online reflective journal using a Google document, (3) the online group discussion via the ZOOM program, and (4) the individual interview session. The participants in this study were Co-op students in *Kasetsart University, Sakon Nakhon campus*, Thailand. There were a total of 72 Co-op students, 36 as a control group and 36 as an experimental group. Both groups were asked to do pre-test and post-test of self-efficacy. The experimental group participated in the intervention process.

The design and development process of intervention derived from the reviewed literature on Cooperative Education and learning, growth mindset, self-fulfilling prophecy, and self-efficacy. ADDIE-instructional design was used to guide the framework of this intervention. The outcomes of design and development were processes and materials including the work session presentation slides, the student manual, the facilitator guide, the online reflective journal template, the online group discussion guideline, and the individual interview questions list.

The intervention started with the growth mindset and self-fulfilling prophecy work session. This work session was about 8 hours long and conducted one month prior to Co-op students' Cooperative Education period. The period in this study was December 2018 – April 2019. Co-op students were required to record their new challenging situations and learning in an online reflective journal weekly. On a biweekly basis, the small groups of six to eight Co-op students in the experimental group were required to join the online group discussion facilitated by the facilitator as a coach. After Co-op students finished their Cooperative Education program, the individual interview session was proceeded to for seeking their attitudes toward the

overall intervention and their perceived learning outcomes from Cooperative Education.

There were two quantitative data analyses to show the effect of the growth mindset and self-fulfilling prophecy intervention on Co-op students' self-efficacy. The mean and the paired-sample t-test were used to analyze the effect. And the stepwise linear regression analysis was used to see whether the independent variables could predict the dependent variables or not. The qualitative data derived from the online reflective journal, online group discussion, and individual interview was analyzed by content analysis, thematic coding, and organizing data by NVIVO12. The following session described both the quantitative results and the qualitative results.

5.2 Summary of Research Findings

The design and development was based on the instructional design ADDIE. The intervention consisted of four parts: (1) work session, (2) online reflective journal, (3) online group discussion, and (4) individual interview session. The 36 students in the experimental group participated in the intervention. They expressed the positive attitude toward intervention that it was very useful. The work session (Pre-Co-op) provided them with the concepts of growth mindset and self-fulfilling prophecy. The online reflective journal (During Co-op) gave them the chance to reflect upon their working experiences in the workplace. While the online group discussion (During Co-op) was a platform for them to share their learning experiences as well as learn from other experiences, the individual interview session (Post-Co-op) was for their reflection after Cooperative Education learning outcomes.

Co-op students recommended the intervention for Cooperative Education students. The benefits of overall intervention are (1) Intervention enabled Co-op

students to change their mindset and have positive thinking, (2) Co-op students could apply their learnings from the work session in the workplace, (3) The intervention encouraged Co-op students on self-reflection and learning, (4) Co-op students learned from others during the intervention process, and (5) Intervention provided Co-op students the channel to release their stress and feelings that occurred in the workplace.

There was the positive effect of growth mindset and self-fulfilling prophecy intervention on Co-op students' self-efficacy. The quantitative data shows the result of the mean scores and paired-sample t-test that there is a statistically significant difference in Co-op students' self-efficacy of the experimental group. The control group pre-test mean scores ($\bar{x}=4.064$, $SD=0.402$) and post-test mean scores ($\bar{x}=4.080$, $SD=0.424$) were reported. The experimental group pre-test mean scores ($\bar{x}=4.010$, $SD=0.258$) and post-test mean scores ($\bar{x}=4.255$, $SD=0.353$) were also shown. The results indicate that the mean scores of the experimental group show a statistically significant difference ($t=-4.110$, $Sig=0.000$) and that there is no statistically significant difference ($t=-0.385$, $Sig=0.703$) in the control group. The results indicate that there is the effect of the intervention toward the Co-op students' self-efficacy. The ANOVA was conducted to see the demographic mean scores difference, students' faculties, and the report showed that there was no difference between faculties. This implied that the intervention could be used for all Co-op students regardless of the faculties they were in.

In addition, the stepwise linear regression analysis was conducted to see whether the independent variables were able to predict the dependents variables. The results showed that there were four independent variables (Achievement, Desired outcome, Awareness to avoid negative action, and Persist in the face of setbacks) which could predict the dependent variables (Goals, Effort and persistence, Learning

achievement, and Activity selection). Achievement is positively and significantly correlated with Goals. And the Desired outcome is positively and significantly correlated with both Effort and persistence, and Learning and achievement. The Awareness to avoid negative action is positively and significantly and Persist in the face of setbacks is negatively significantly correlated with Activity selection. There were qualitative data showing that there was a slight effect of intervention on Co-op students' self-efficacy. The qualitative data on Co-op students' learning outcomes from Cooperative Education were (1) Co-op students adopted the new mindset, skills, and competencies to foster their growth, (2) Co-op students learned to adapt themselves to others and the culture of the workplace and make necessary development, (3) Co-op students experienced the real job to develop their competence and employability, and (4) Co-op students gained support from workplace mentors and academic professors academically, professionally, personally, and psychologically. Importantly, Co-op students viewed that the support from coaches, mentors, and professors was vital for their learnings from Cooperative Education.

5.3 Discussion on the Study

Four research hypothesis for this study were set at the beginning of the study, which related both quantitative and qualitative data. The research hypothesis test results showed as follows.

Hypothesis (a): There are statistical significant difference of pre-test and post-test of self-efficacy mean scores in experimental.

This hypothesis was accepted. The result of the mean scores and paired-samples t-test showed that there is a statistically significant difference in Co-op students' self-efficacy of experimental group. The control group pre-test mean scores (\bar{x} =4.064,

SD=0.402) and post-test mean scores (\bar{x} =4.080, SD=0.424) was reported. While experimental group pre-test mean scores (\bar{x} =4.010, SD=0.258) and post-test mean scores (\bar{x} =4.255, SD=0.353) was shown. The result shows that the mean scores of the experimental group is statically significant different (t =-4.110, Sig=0.000) and there is no statically significant different (t =-0.385, Sig=0.703) in control group. The result indicates that there is the effect of the intervention toward the Co-op students' self-efficacy.

Hypothesis (b): All independent variables from growth mindset and self-fulfilling prophecy can predict the dependent variables of self-efficacy.

This hypothesis was rejected. The results showed that there were only 4 (out of 9) independent variables (Achievement, Desired outcome, Awareness to avoid negative action and Persist in the face of setbacks) could predict the dependent variables (Goals, Effort and Persistent, Learning achievement, and Activity selection).

Hypothesis (c): Co-op students express their positive attitude and gain learning outcomes toward overall intervention.

This hypothesis was accepted. The results show that Co-op students express their positive attitude toward the overall intervention. They revealed that the overall intervention was very useful and practical. The overall intervention enabled them to (1) shift their mindset to growth mindset and have positive thinking (2) apply their learnings from the work session in the workplace (3) encourage them on self-reflection and learning (4) learn from their friends and facilitator during the work session and online group discussion in the intervention process and (5) provide them the channel to release their stress and feelings occurred in workplace.

Hypothesis (d): The intervention could be implemented by encouraging related stakeholders of Cooperative education.

This hypothesis was accepted. Co-op students expressed that during their Cooperative education period, they learned from workplace mentors and academic professors academically, professionally, personally, and psychologically. Supporting from their mentors was very important. With the good relationship and support from their mentors, as consultant and coach, Co-op students would achieve more. The professors also supported them on their project as well as their personal issue during their Cooperative education. However, the study revealed that the more involvements of workplace mentor and professors are needed. They should be knowledgeable in the growth mindset concept and apply it with Co-op students in order to enhance academic achievement.

The growth mindset and self-fulfilling prophecy intervention was designed and developed based on the concepts of the ADDIE model, active learning, and blended learning and learning model (70-20-10) to match with Cooperative Education. The intervention was integrated into the pre, during, and post Cooperative Education process.

The findings confirm that Co-op students in the experimental group demonstrated active learnings throughout the intervention process while working in the workplace. The online reflective journal and online group discussion were used to keep the momentum of Co-op students' learning. It was found that the online reflective journal was used effectively by Co-op students who reflected upon themselves, recorded in the journal, came back and to think about what they recorded, and then they made improvement in order to not repeat the same mistake. It also found that the online

group discussion provided them with the digital learning platform for sharing their experiences reflected from their online reflective journal as well as learning from others. This indicated that Co-op students continued their learning in the Cooperative Education period. With experiential learning, as Kolb (1999) emphasized on the continuous learning process, learners observe, reflect, apply and improve, and at the end, learners promote 'lifelong learning'. However, this study could not clearly ensure the 'lifelong learning' of Co-op students after Co-op students completed their Cooperative Education.

Through such self-reflection and learnings from others by using the online reflective journal and online group discussion as mentioned, this study also found that Co-op students learned from their friends and facilitators. This learning helped them in problem solving and to be motivated and encouraged from others' experiences. This is partly similar to the finding of Desta's study (2009) that through self-reflection and peer learning, students are initiated and engaged in their critical thinking and inquiry. Moreover, the above findings aligned with the result presented in research of Fingon & Fingon (2008), and Gibbs (1988) which found that what the learners learn and think will help learners to resolve problems.

The Eames & Cates (2001) study mentioned that students learned from the success and failures of others. This present study found that Co-op students learned from their friends during the work session and online group discussion. They not only gained the learnings from the successes and failures of others but also increased motivation and encouragement from friends' shared experiences.

Co-op students showed their learning by his/her own reflection. Along the intervention process, there were coaches, mentors, and professors who were Co-op

students' encouraging self-reflection supporters. The coach (researcher) – which by design was involved in all parts of intervention: work session, online reflective journal, online group discussion, and individual interview session – helped Co-op students to find the solutions by asking coaching questions and allowed Co-op students to reflect upon on themselves. The mentor consulted and coached on Co-op students' daily works and projects. And, the professor gave advice on the projects and feedback on students' behaviors and performance in the workplace. These three supporters' ease of reflective dialogue resulted in Co-op students' learnings. The present findings confirmed with Schon's study (Cited by Eames & Cates, 2011) that students frame knowledge into critical inquiry by the reflection which happens either as individuals or with assistance of reflective dialogue with a coach, mentor or teacher.

In addition, Auten (2013), Cogdill (2013), Fegley (2010), Hansen (2016), and Willeke (2015) confirmed that the growth mindset of the students and teachers plays an important role in academic achievement. The professor, therefore, should be knowledgeable in the growth mindset concept and apply it with Co-op students in order to enhance academic achievement.

The standard also required professors to visit Co-op students at the workplace at least once. The current research found that professors visited Co-op students once. The Co-op students expressed their preference to meet their professors more often so that they could consult with them and reflect upon themselves while working. The challenge of professor visits was the limitation of time and number of Co-op students. The use of digital communication such as webinar, video conference, or Zoom program, etc., will be more efficient and effective as this study found that the online tools were very useful and practical in this digital era.

After completion of Cooperative Education, Co-op students assured their achievement on learning outcomes. They adopted the new mindset, skills, and competencies to foster their growth, learned to adapt themselves to others and the culture of the workplace and make necessary development, and experienced the real job to develop their competence and employability. The set learning outcome of the Cooperative Education program of *Kasetsart University, Sakon Nakhon campus, Thailand* stated that

1) students gain real experiences in the field of study in addition to campus learning, 2) students developed themselves in work system, self-development, work collaboration, responsibility, and self-confidence which are desired qualities of employers, 3) students' academic performance increases after completion of Cooperative Education, 4) students have understanding and a good attitude toward the profession, 5) students increase communication skill, 6) students make the right decision on their careers, 7) students build networks with people in the same profession, and 8) students' employability increases (University, K., 2019).

The above expected learning indicated that some of the learning outcomes such as increased academic performance after Cooperative Education and making the right decision on their careers have not yet happened during this study.

Nevertheless, the learning outcomes of Co-op students are congruent to Srisa-an mentioning that the Cooperative Education is to help Co-op students in “knowing oneself, knowing others, and knowing work” with the implied employability and career development (2018). These work experiences from the Cooperative Education of newly

hired employees make faster work transition, which employers valued the most (Eames & Cates, 2011).

Co-op students found the “what is in it for me” of Cooperative Education. Knowing oneself referred to what Co-op students reflected upon themselves and knowing their strengths, weaknesses, values, and skills. Knowing others means that Co-op students experienced relationships with others and how to adapt themselves with social situations and the culture in the working environment. And, knowing work during Cooperative Education helps Co-op students in career development and employability decisions. Although six out of 36 were offered the job after completion of their Cooperative Education, the rest of the Co-op students realized what their favorite type of job was and were able to make the right decision for their career development. This reflected on Co-op students’ self-efficacy on their competence and led to their obtaining employability.

After documentary review, the standard of Cooperative Education at *Kasetsart University, Sakon Nakhon campus*, Thailand like at other Thai Universities, was limited to some certain subjects for the Cooperative Education preparation program, not the growth mindset and self-fulfilling prophecy. Meanwhile, Auten (2013) promoted that “A growth mindset is a crucial first step in attaining the skills necessary to succeed in the 21th century”. Seconded by research from LinkedIn and the World Economic Forum, indications are that the skills, especially soft skills, will be retained and increase in value, including active learning, adaptability, collaboration, time management, analytical thinking and creativity, and even the demand for technology competencies increases. The mentioned soft skills allowed students to navigate new information and make decisions effectively (Solution, 2019).

The Office of the Higher Education Commission (OHEC) established the five domains of learning and learning outcome for graduates, which are 1) Ethical and moral development, 2) Knowledge, the ability to understand, recall and present information, 3) Cognitive skill, 4) Interpersonal skill and responsibility, and 5) Analytical and communication skills (OHEC, 2006). To achieve those learning outcomes, in this study, it is recommended that Co-op students or students in general would be provided with the soft skill of growth mindset and self-fulfilling prophecy which enhanced the expected learning outcomes.

Apart from the qualitative result as discussed above, the study of the growth mindset and self-fulfilling prophecy intervention in quantitative research revealed that there was a statistically significant difference between the pre-test and post-test of mean scores of Co-op students' self-efficacy. The mean scores and paired-sample t-test showed that there is a statistically significant difference in Co-op students' self-efficacy of the experimental group. The pre-test mean scores ($\bar{X}=4.010$, $SD=0.258$) and post-test mean scores ($\bar{X}=4.255$, $SD=0.353$) have a statistically significant difference ($t=4.110$, $Sig=0.000$). The result indicates that there is the effect of the intervention toward the Co-op students' self-efficacy.

These findings were consistent with results from the following research. Cogdill (2013) revealed that students with a growth mindset were more likely to hold positive self-evaluations and participate in future activities. Blackwell, Trzesniewski, and Dweck (2007) also mentioned that the students with a growth mindset likely to choose more positive, effort-based strategies in response to any failures, increased academic achievement by endorsing stronger learning goals, had more positive beliefs about effort, and made fewer 'helpless' attributions. In addition, the results of studies on the

self-fulfilling prophecy by McCane (2008), Haynes (1978), Heyward-Evans (2003), and Bamburg (1994) also show increases in students' academic performance and achievement.

Even though the two independent variables, 'Find lessons and inspiration in the success of others' and 'Meet expectations,' did not show a statistically significant difference, this may be because Co-op students lacked self-confidence and were less trusting of either the success model or the persuader. Bandura (1977) and Schunk & Pajares (2009) stated that the latter credibility is crucial in ensuring the efficacy perception of learners.

In this study, the stepwise linear regression analysis was conducted to see the correlation between the independent variables and dependent variables. There were a total of four independent variables (Achievement, Desired outcome, Awareness to avoid negative action, and Persist in the face of setbacks) that could predict the dependent variables (Goals, Effort and persistence, Learning and achievement, and Activity selection). Three (Achievement, Desired outcome, Awareness to avoid negative action) out of the four predictive independent variables are from self-fulfilling prophecy influences.

However, there were five non-correlation growth mindset and self-fulfilling prophecy variables (Embrace challenges, See the effort as the path to mastery, Learn from criticism, Find lessons and inspiration in the success of others, and Meet expectations) on Co-op students' self-efficacy, and there were qualitative data against the quantitative data which showed the relations of those independents on students' self-efficacy. The findings showed that Co-op students accepted and embraced challenges and tried very hard to achieve them. Whenever the setbacks occurred, Co-

op students persisted and never gave up. They also believed in putting forth the effort with practice in order to be skillful and masterful. With the criticism, Co-op students were open to feedback and improved themselves. They were inspired and motivated from the success of others, which they viewed as the source of positive influence on their goals. Lastly, they set clear and realistic goals with others so that they behaved in such a way to achieve them.

There were studies of growth mindset intervention with different variables and intervention. Comparing the designed process of this study with the following three studies of Garofalo (2016), Wilkins (2014), and Mary Caufield Baldrige (2010) about growth mindset intervention, the results showed that even the quantitative data did not show a statistical difference, but there were slight effects from the intervention from the qualitative data.

In the study of Garofalo (2016) on 'Teaching the character competencies of growth mindset and grit to increase student motivation in the classroom' with the intervention as workshop-unit approach, journal keeping and MSLQ, the results found that there was no statistical significance in students' growth mindset means. There also was no causal relationship between growth mindset and motivation or grit and motivation. Similar to the finding of the Wilkins (2014) study of 'Efficacy of a growth mindset intervention to increase student achievement by using the Brainology® online program and focus group, there were no significant changes in students' mindsets, effort beliefs, academic self-efficacy, and use of study skills strategies for learning but there was an increase in science grade over the course of the study. Also, the Mary Caufield Baldrige (2010) study on 'The effect of growth mindset intervention on the beliefs about intelligence, effort beliefs, achievement goal orientations, and academic

self-efficacy of LD students with reading difficulties' did not reveal the strong pattern of positive motivational change significantly after intervention. However, the qualitative data showed the students' absorption of the brain changes with learning and that learning increases intelligence through brain plasticity. From the above research, there was no significant change in numerical data but there were slight effects on the behaviors or learning outcome of the students. The assumed reasons was that the change or the effect of behaviors might not be numerically measurable and the effect of the size of the sample.

Green (1991) recommended acceptable sample size if to test the overall model, recommending a minimum sample size of $50+8K$ in which K is the number of predictors. So in this study the sample size should be $50+ (8*9) = 122$ samples. And if a test of individual predictor, then the recommended sample size was $104+K$. So in this study the recommended sample size was $104+9= 113$ samples. Thirty-six samples might not be enough to show the significant relationship between variables. Initially, the quasi-experimental design used a sample size of 36 students due to the limitations of experimental study such as the number of Co-op students, the work session class size, and the number of students in each small online group discussion.

5.4 The Guidelines

The findings of this study had provided the evidence of the effectiveness of growth mindset and self-fulfilling prophecy intervention which enhance Cooperative Education students' self-efficacy. The followings are the guidelines of growth mindset and self-fulfilling prophecy development to enhance Cooperative Education students' self-efficacy.

1) This study found that Co-op students expressed a positive attitude toward the overall intervention after completion of Cooperative Education. They found that the integrated four parts of intervention, which as implemented in pre, during, and post Cooperative Education, were very practical, applicable, and useful. The quantitative data show the experimental group pre-test mean scores ($\bar{x}=4.010$, $SD=0.258$) and post-test mean scores ($\bar{x}=4.255$, $SD=0.353$) having a statistically significant difference ($t=-4.110$, $Sig=0.000$). Thus, overall intervention would be recommended to be implemented for all Cooperative Education students along the Cooperative Education program. The proved four integrated parts of intervention are complemented and interrelated to one another. This leads to an increase in their self-efficacy, resulting in students meeting their expected learning outcomes. The key success of intervention implementation was the support from the coach, workplace mentor, and professor. However, in this study, the intervention was implemented with small group of Co-op students, the implication to the larger group of Co-op students would be adapted to various context. The knowledge and principle of this intervention are transferable. The intervention process may be adjusted but the concept and principle of intervention are still remained. To ensure the efficiency and the effectiveness of the intervention implementation, it is recommended to remain the small size group of participants not more than 50 participants per work session, and up to 15 participants per group discussion. The frequency of the online reflective journal and online group discussion can be flexible according to resources availability.

2) Co-op students learned from the coach (facilitator) during the online group discussion. They felt comfortable in sharing their experiences or any problems that occurred in the workplace during the online group discussion. Students found solutions

by themselves from being asked the questions and reflected from the coach. Therefore, it is recommended that there should be someone as a coach for Co-op students to share any concerns and consult with on problems during their Cooperative Education period. With the limitations of university resources, the coach does not necessarily have to be a professor but anyone who is skillful, empathetic, helpful, and considerate so that Co-op students could consult and ask for advice. The coach is very important for continuing students' learning. The coach needs to be certified on the concept of how to coach and how to give feedback.

3) The professor provided support to Co-op students academically, professionally, personally, and psychologically during the Cooperative Education. The professor normally meets the workplace mentor and advises students on their project progress and provides feedback on students' behaviors and performance in the workplace. The drawback of this support was that the standard of Cooperative Education required professors to visit Co-op students at least once and spend time of at least one hour per visit. This study found that the professor visit to Co-op students of only one time was not sufficient. Co-op students preferred to have the professor visit more than once so that they could consult on their project and daily working life. In order to make professor visits more effective, there should be a review of the standard on the frequency of time and visits in the Cooperative Education program. The review would be on the increase of frequency and/or the use of communication technology to coach Co-op students, virtually or remotely.

4) The workplace mentor was a coach and consultant of Co-op students on their daily work and projects. Co-op students mentioned that support from the mentor was very important. With a good relationship with the mentor, Co-op students achieved

more. Similar to the professor, the mentor supported Co-op students academically, professionally, personally, and psychologically during the Cooperative Education.

5) From the study, the data shows that Co-op students who participated in growth mindset and self-fulfilling prophecy intervention enhanced their self-efficacy. The pre-test and post-test of mean scores of self-efficacy reported statistically significant differences. Focusing on the growth mindset part, the findings in the studies of Auten (2013), Cogdill (2013), Fegley (2010), Hansen (2016), and Willeke (2015) showed that the growth mindset of the students and teachers plays an important role in academic achievement. Therefore, mentor, professor and coach should learn about growth mindset so that they can support Co-op students on the growth mindset concept. As a certified coach, the researcher would recommend that mentor, coach, and professor further learn on coaching skills which would be useful for Co-op students. For example, when giving growth mindset feedback to Co-op students, praise their effort and progress but don't overemphasize perfect performance.

6) The findings of this study show that the use of the online reflective journal and online group discussion in intervention encouraged Co-op students on self-reflection and learning. The online reflective journal engaged Co-op students to reflect upon themselves and learn from challenging situations in the workplace. They were aware of themselves more, not to repeat the same mistakes, and to make the right decision in the future. While the online group discussion provided them with the platform to share their experiences and was a channel to release their stress, Co-op students expressed that they enjoyed having conversations with friends and the facilitator, learning from others, and finding the solutions of problems. As this digital

platform decreases the limitation of the time constraints of coaching and the professor visit, this platform is recommended to suit the digital native generation's preference.

7) The highest mean score of independent variables in this study was the Desired outcome, which referred to the new skills, competencies, knowledge, and new learning students may receive. This implied that Co-op students learned new things from their Cooperative Education. Thus, it is recommended that a Cooperative Education program should be added to other curriculums, either compulsory or selective, with university encouragement so that students can learn from real experiences. Moreover, the four-month period of Cooperative Education should be reviewed on whether to be longer so that Co-op students could learn more, resulting in an increase of their employability. As the Linn, Howard, & Miller (2004) study indicates, "one of the attributes employers value most in newly hired employees is work experience". To make the change to a longer Cooperative Education period, the revision of existing unnecessary courses should be done to compensate with the benefit of Cooperative Education. Moreover, the Cooperative Education policy needs to be revised in terms of duration, project, students' compensation, mentor, professor, and university support.

8) In this present study, there was a significantly effect of Achievement variables on goals. Students set very high challenging goals and put high effort and dedication into them. They worked hard and did their best by seeking criticism and improvement of themselves. However, this study also found that Co-op students did not understand clearly their learning outcomes of Cooperative Education even though they were communicated. Therefore, it is recommended that the university should communicate more on the measurable and practical learning outcomes to Cooperative

Education students prior to their Cooperative Education. Then, Co-op students should set their goals on the expected learning outcomes so that they know why, what, and how to achieve them.

9) In this study, the stepwise linear regression analysis was conducted to see the correlation between the independent variables and dependent variables. There were a total of four independent variables (Achievement, Desired outcome, Awareness to avoid negative action, and Persist in the face of setbacks) that could predict the dependent variables (Goals, Effort and persistence, Learning and achievement, and Activity selection). Three (Achievement, Desired outcome, and Awareness to avoid negative action) out of the four predictive independent variables are from self-fulfilling prophecy influences. Even though not all independent variables could predict the dependent variables, the qualitative data show that all those independent variables have an effect on it. Therefore, the intervention should definitely include the self-fulfilling prophecy concept to enhance Co-op students' self-efficacy.

5.5 Limitations of the Study

The findings of this study have to be seen in the light of some limitations. There are three major limitations that could be addressed in future research. They are:

1) On the issue of practicality, in this study all parts of intervention were online-based except the work session. There were two students who worked in a remote area out of Thailand. The internet access was not stable, therefore their participation rate was lower than 50% so that the research dropped out of their participation in this study.

2) In this study, the quasi-experimental design was used to test the effect of intervention. Due to the limitation of the effective size of the work session and online

group discussion, the sample size of this study was only 72 Co-op students, 36 in the control group and 36 in the experimental group. However, the stepwise linear regression analysis also was used to see the correlations of the variables. To be effective in prediction, the recommended sample size by Green (1991) was 113 samples. With this limitation, the results showed that not all independent variables can predict the dependent variables.

3) The sample of the present study was a group of Co-op students in *Kasetsart University, Sakon Nakhon campus*, Thailand. Consequently, the implication of this study should be adapted to suit to various context.

5.6 Recommendations for Future Research

Apart from the focus of this study, there are other interesting aspects that might be considered for future study.

1) Future research should be carried out on the growth mindset and self-fulfilling prophecy intervention with Co-op students in other academic institutions to confirm the effect of intervention.

2) Future research should examine the effect of growth mindset and self-fulfilling prophecy intervention in a longer period of the Cooperative Education program and/or an international Cooperative Education program on Co-op students' learning outcomes over time.

3) Future research should include the motivation variables as few studies mentioned that the growth mindset affected students' motivation.

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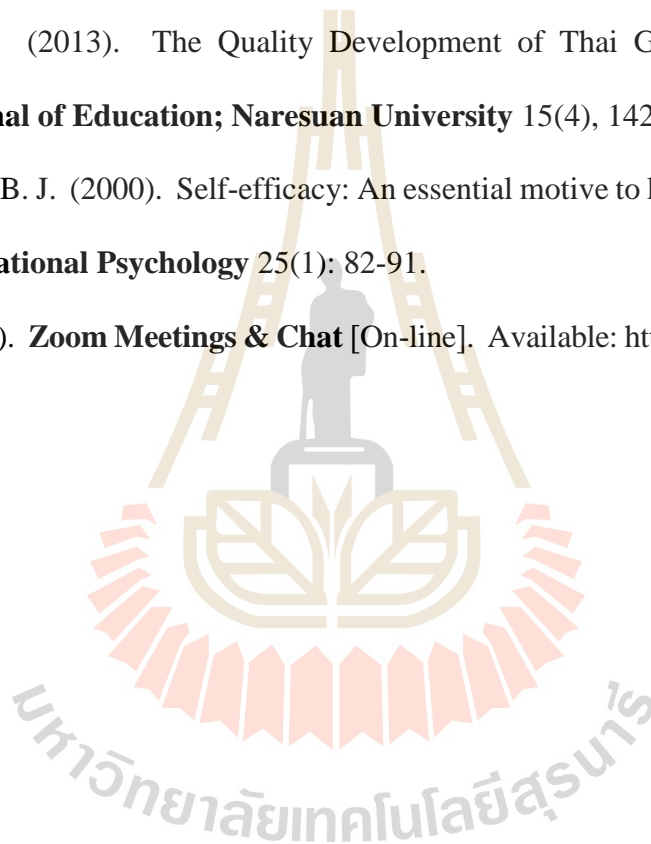
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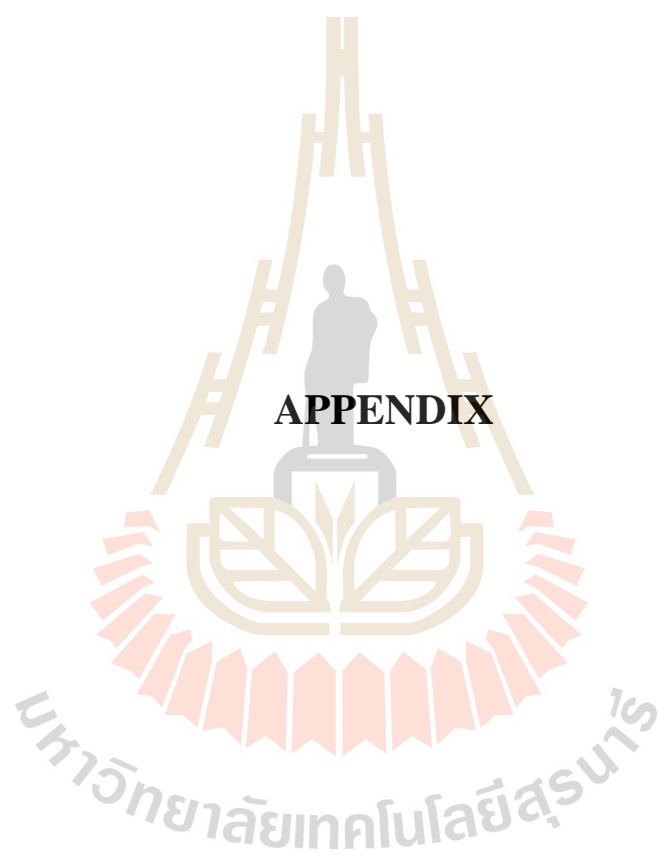
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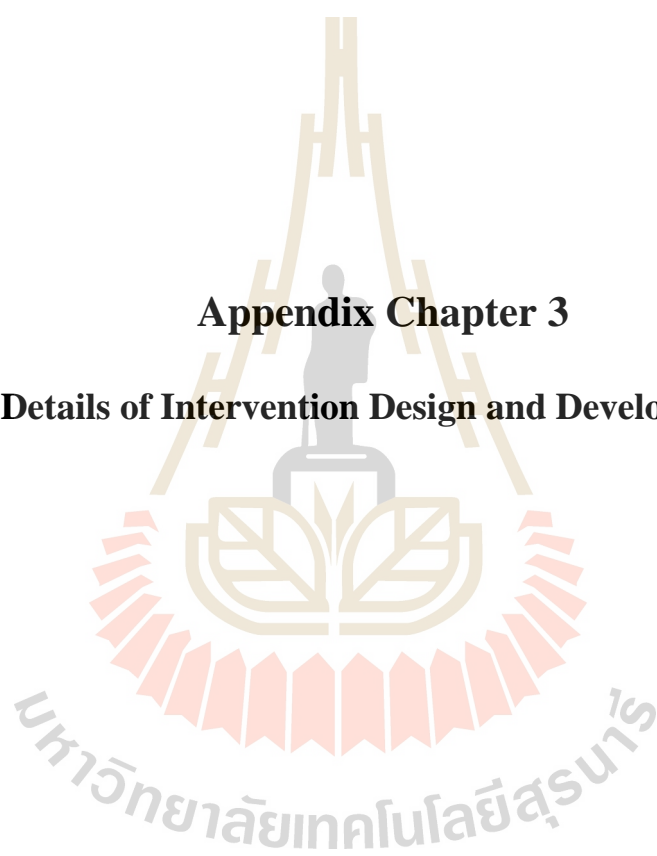
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Appendix Chapter 3

Details of Intervention Design and Development



Appendix 3.1

Cluster analysis

Cluster analysis was the step to define the main topics of the contents. In this study, there were four main topics, which are (1) Brain, (2) Mindset, (3) Self-fulfilling prophecy, and (4) Reflective journal. More detail of cluster analysis is located in external file accessed via QR code.



Appendix 3.2

Task inventory

Task inventory was the step to add on all the content details. It was sequenced from task to sub-task and sub-sub-task in table format. More detail of task inventory is located in external file accessed via QR code.



Appendix 3.3

Task knowledge

Task knowledge was the step to gather all information from various primary sources to ensure alignment in each task. The task knowledge included pictures, video clips, and text. More detail of task knowledge is located in external file accessed via QR code.



Appendix 3.4

Input-Action-Output Diagram Instructional Goal and Observable and Measurable Learning Outcome

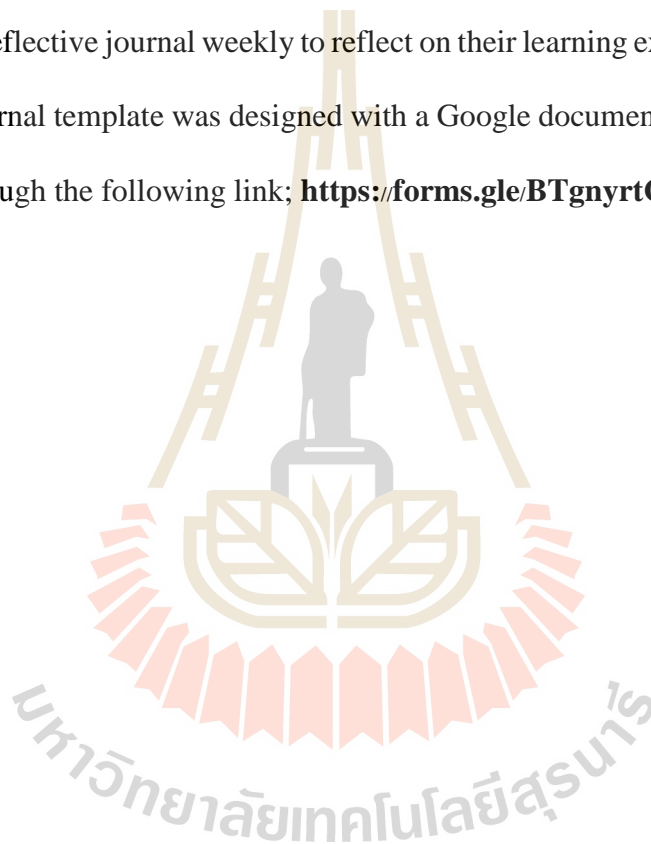
Input-Action-Output Diagram Instructional Goal and Observable and Measurable Learning Outcome was under the design step which was to identify how Co-op students' learning occurs. The learning objectives needed to be defined in order to find the right strategies to achieve it. The behavioral objectives and observable and measurable learning outcomes were set. More detail of Input-Action-Output Diagram Instructional Goal and Observable and Measurable Learning Outcome is located in external file accessed via QR code.



Appendix 3.5

Online reflective journal template

The online reflective journal was a form of self-report where Co-op students could record their situations, feelings, how to solve problems, embrace challenges, and so on. During the Cooperative Education period, Co-op students were required to record their online reflective journal weekly to reflect on their learning experiences. The online reflective journal template was designed with a Google document template. It could be accessed through the following link; <https://forms.gle/BTgnyrtCVDkZZZ1o6>



Appendix 3.6

Online group discussion guideline

การสนทนากลุ่มย่อยออนไลน์

การสนทนากลุ่มย่อยออนไลน์ โดยใช้โปรแกรม ZOOM ซึ่งเป็นโปรแกรมที่ไม่มีค่าใช้จ่าย นักศึกษาสามารถเข้าโปรแกรมผ่านทางอินเทอร์เน็ต หรือ แอปพลิเคชันทางโทรศัพท์ โดยมีแนวทางดังต่อไปนี้

1. ผู้วิจัยให้รหัสการเข้ากลุ่มให้กับนักศึกษาในวันอบรม
2. ผู้วิจัยนัดหมายกับนักศึกษาแต่ละกลุ่ม โดยระบุวันและเวลา รวมทั้งหมด 8 ครั้ง
3. เมื่อถึงเวลานัดหมาย นักศึกษาและผู้วิจัย Log in เข้าสู่โปรแกรม ZOOM
4. ผู้วิจัยเป็นผู้ดำเนินการสนทนา โดยมีหัวข้อสนทนาดังต่อไปนี้
 - a. สถานการณ์และสิ่งที่ได้เรียนรู้ในการปฏิบัติสหกิจศึกษา
 - b. การประยุกต์ใช้สิ่งที่เรียนรู้ เช่น เรื่องการพัฒนาของสมอง กรอบความคิดแบบเติบโต หรือการแสวงหาความต้องการของตนเอง
 - c. ประเด็นปัญหา หรือคำถามในการปฏิบัติสหกิจศึกษา
 - d. การสะท้อนคิดของนักศึกษาต่อสิ่งที่ได้เรียนรู้และการนำสิ่งที่เรียนรู้ไปใช้อย่างไร
 - e. สรุปประเด็นในการพูดคุย

แนวปฏิบัติในการสนทนากลุ่มย่อยออนไลน์

- สถานที่เป็นส่วนตัว มีระบบเชื่อมต่ออินเทอร์เน็ต
- ไม่ระบุชื่อบุคคลที่สาม หากจำเป็นให้ใช้ชื่อสมมุติ
- ไม่ให้รหัสการเข้าสนทนากลุ่มย่อยกับบุคคลอื่นที่ไม่ใช่อาสาสมัคร
- ไม่เผยแพร่บทสนทนากับบุคคลอื่นที่ไม่ใช่อาสาสมัคร การสนทนาเป็นไปเพื่อการเรียนรู้เท่านั้น

Appendix 3.7

Semi-structured individual interview questions

แบบสัมภาษณ์

งานวิจัยเรื่อง

“แนวทางการพัฒนากรอบความคิดแบบเติบโตและการคาดการณ์ของตนเองที่ส่งผลให้เกิดขึ้นจริง เพื่อส่งเสริมการรับรู้ความสามารถของตนเองของนักศึกษาสหกิจศึกษา”

ขอบคุณมากที่เข้าร่วม โครงการครั้งนี้ ขอใช้เวลาสัก 15-30 นาที อยากให้คิดถึงกระบวนการที่เราทำ ตลอด 4 เดือน

ย้อนนึกถึงวันที่อบรม มีอะไรที่คิดว่าเป็นประโยชน์ มีอะไรที่คิดว่าน่าจะทำได้ดีขึ้น

การเขียน Journal มีประโยชน์อย่างไร มีอุปสรรคอะไรบ้าง มีความเห็นอย่างไรกับการสะท้อนคิด ระยะเวลาในการเขียนเหมาะสมหรือไม่

การเข้า ZOOM meeting มีประโยชน์อย่างไร ความถี่ในการเข้าเหมาะสมหรือไม่ อย่างไร มีคำแนะนำเพิ่มเติมหรือไม่

มีความคาดหวังกับบทบาทของผู้นำประชุมอย่างไร และผู้นำประชุมควรมีคุณสมบัติอย่างไร

โดยภาพรวม คิดว่าการทำกระบวนการนี้มีประโยชน์ต่อนักศึกษาสหกิจศึกษา อย่างไร ถ้าเสนอแนะ ได้อะไรให้ทำอะไรเพิ่มเติม

การเข้าพบของอาจารย์นิเทศมีประโยชน์อย่างไร ต้องการการสนับสนุนเพิ่มเติมอะไร

3 เรื่องหลักๆ ที่ได้เรียนรู้จากการไปปฏิบัติสหกิจศึกษา

มีคำถามจะถามผู้สัมภาษณ์หรือไม่

Appendix 3.8

Test analysis

The pre-test and post-test of the work session were developed to measure the knowledge and understanding from the work session. There were both multiple choice and open-ended questions. The test analysis was done to ensure that all the tasks were evaluated. More detail of test analysis is located in external file accessed via QR code.



Appendix 3.9

Measurable learning outcome test

Measurable learning outcome test was developed from the consequences of the task analysis, to evaluate Co-op students' knowledge and understanding in each task according to the test analysis. This measurable learning outcome test was used as pre-test and post-test in the work session. There were a total of 52 items of the test. More detail of measurable learning outcome test is located in external file accessed via QR code.



Appendix 3.10

Observable learning outcome test

Observable learning outcome test was to ensure that Co-op students understand the contents in work session and be able to demonstrate the observable learning outcome. The test was developed to evaluate certain tasks during the work session. The Co-op students' observable learning outcome was rated by the facilitator. More detail of observable learning outcome test is located in external file accessed via QR code.



Appendix 3.11


Objective (TPO-EO)- Criterion Chart

The objective (TPO-EO)-criterion chart was set to measure the learning outcome an expected behaviors from the work session. More detail of objective (TPO-EO)-criterion chart is located in external file accessed via QR code.




Appendix 3.12

Consent form – Experiment group

1	AF/13-08/01.0
 <p>Suranaree University of Technology Institutional Review Board</p>	<p>หนังสือแสดงเจตนายินยอมเข้าร่วมโครงการวิจัย (Informed Consent Form)</p>
<p>ข้าพเจ้า (นาง / นางสาว / นาย) นามสกุล อายุ ปี บ้านเลขที่ หมู่ที่ ตำบล อำเภอ จังหวัด</p> <p>.....</p> <p>ได้รับฟังคำอธิบายจาก นางสาวอังคณา ธนปิยะวัฒน์ เกี่ยวกับการเป็นอาสาสมัครในโครงการวิจัยเรื่อง “แนวทางพัฒนารอบความคิดแบบเติบโตและการแสวงหาความต้องการของตนเองเพื่อส่งเสริมการรับรู้ ความสามารถของตนเองสำหรับนักศึกษาสหกิจศึกษา” โดยข้อความที่อธิบายประกอบด้วย วัตถุประสงค์ของ การวิจัย ประโยชน์โดยตรงที่อาสาสมัครจะได้รับจากการเข้าร่วมโครงการวิจัยในครั้งนี้ ขั้นตอนการปฏิบัติตัว การขออนุญาตในการตอบแบบประเมิน เข้าร่วมการอบรม การสนทนากลุ่มออนไลน์ การสัมภาษณ์ การจด บันทึก พร้อมทั้งบันทึกเทป หรือถ่ายภาพ ในการสนทนากลุ่มและการสัมภาษณ์ เพื่อนำข้อมูลที่ได้ไปพัฒนา และปรับปรุงแนวทาง และจะทำการทำลายเทปหลังสิ้นสุดการวิจัย จะไม่มีการเผยแพร่ภาพถ่ายที่มีรูปของ ข้าพเจ้าแก่สาธารณะ ตลอดจนการรับรองจากผู้วิจัยที่จะเก็บรักษาข้อมูลของข้าพเจ้าไว้เป็นความลับ และไม่ ระบุชื่อหรือข้อมูลส่วนตัวเป็นรายบุคคลต่อสาธารณชน โดยผลการวิจัยจะนำเสนอในลักษณะภาพรวมที่เป็น การสรุปผลการวิจัยเพื่อประโยชน์ทางวิชาการเท่านั้น “ในกรณีเข้าร่วมเป็นอาสาสมัครของโครงการวิจัยครั้งนี้ ข้าพเจ้าเข้าร่วมด้วยความสมัครใจ” และข้าพเจ้าสามารถถอนตัวจากการศึกษานี้เมื่อใดก็ได้ ถ้าข้าพเจ้า ปรารถนาและหากเกิดมีเหตุการณ์ที่ไม่พึงประสงค์</p> <p style="text-align: center;">ข้าพเจ้าได้อ่านและเข้าใจตามคำอธิบายข้างต้นแล้ว จึงได้ลงนามยินยอมเข้าร่วมโครงการวิจัยนี้</p> <p style="text-align: right;">ลงชื่อ อาสาสมัคร (.....) วันที่ เดือน พ.ศ.</p>	

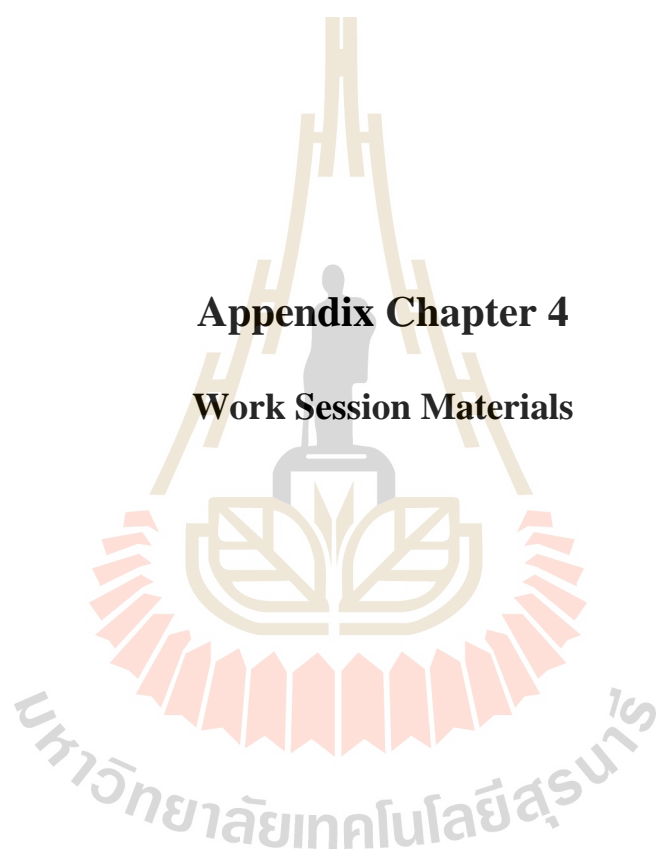
Appendix 3.13

Consent form – Control group

1	
AF/13-08/01.0	
 Suranaree University of Technology Institutional Review Board	หนังสือแสดงเจตนายินยอมเข้าร่วมโครงการวิจัย (Informed Consent Form)
<p>ข้าพเจ้า (นาง / นางสาว / นาย) นามสกุล อายุ ปี บ้านเลขที่ หมู่ที่ ตำบล อำเภอ จังหวัด</p>	
<p>ได้รับฟังคำอธิบายจาก นางสาวอังคณา ธนปิยะวัฒน์ เกี่ยวกับการเป็นอาสาสมัครในโครงการวิจัยเรื่อง “แนวทางพัฒนากรอบความคิดแบบเติบโตและการแสวงหาความต้องการของตนเองเพื่อส่งเสริมการรับรู้ ความสามารถของตนเองสำหรับนักศึกษาสหกิจศึกษา” โดยข้อความที่อธิบายประกอบด้วย วัตถุประสงค์ของ การวิจัย การขออนุญาตในการตอบแบบประเมิน ตลอดจนการรับรองจากผู้วิจัยที่จะเก็บรักษาข้อมูลของ ข้าพเจ้าไว้เป็นความลับ และไม่ระบุชื่อหรือข้อมูลส่วนตัวเป็นรายบุคคลต่อสาธารณชน โดยผลการวิจัยจะ นำเสนอในลักษณะภาพรวมที่เป็นการสรุปผลการวิจัยเพื่อประโยชน์ทางวิชาการเท่านั้น “ในการเข้าร่วมเป็น อาสาสมัครของโครงการวิจัยครั้งนี้ ข้าพเจ้าเข้าร่วมด้วยความสมัครใจ” และข้าพเจ้าสามารถถอนตัวจาก การศึกษานี้เมื่อใดก็ได้ ถ้าข้าพเจ้าปรารถนาและหากเกิดมีเหตุการณ์ที่ไม่พึงประสงค์</p>	
<p>ข้าพเจ้าได้อ่านและเข้าใจตามคำอธิบายข้างต้นแล้ว จึงได้ลงนามยินยอมเข้าร่วมโครงการวิจัยนี้</p>	
<p>ลงชื่อ อาสาสมัคร (.....)</p>	
<p>วันที่ เดือน พ.ศ.</p>	

Appendix Chapter 4

Work Session Materials



Appendix 4.1

The presentation slides of the work session

The presentation slides of the work session were used for explaining and showing the video clip so that Co-op students learned more on the concept. With the active learning design, Co-op students were encouraged to participate and interact with friends through various activities; self-assessment, video watching, case study, role play, and experience sharing. There were a total of four main topics: 1) Brain, 2) Mindset, 3) Self-fulfilling prophecy, and 4) Reflective journal. More detail of the presentation slides of the work session is located in external file accessed via QR code.



Appendix 4.2

Student Manual

The student manual was designed to enhance Co-op students' learnings in the work session. The objectives of the student manual were for Co-op students' self-learning record and reference. There were a total of four main topics which aligned with the presentation slides. This also included four self-assessments: brain health test, mindset test, growth mindset rubrics test, and stress test for Co-op students to reflect upon themselves. The "fill in the blank" page in the student manual was for Co-op students to take notes on the key learnings by themselves. More detail of the student manual is located in external file accessed via QR code.



Appendix 4.3

Facilitator guide

The facilitator guide was developed to ensure the standard and consistence of contents and delivery for other facilitators. The facilitator guide included the preparation for the work session, work session materials, the video list, the objectives of each topics, the scripts of key contents, and the activities instruction. More detail of the facilitator guide is located in external file accessed via QR code.



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