# CHAPTER 3
# LITERATURE REVIEW

This chapter describes the methodology employed in the present study. It explains the research design, the characteristics of the participants, the research instruments, the research approach, the techniques applied for data analysis, as well as the findings from the pilot study.
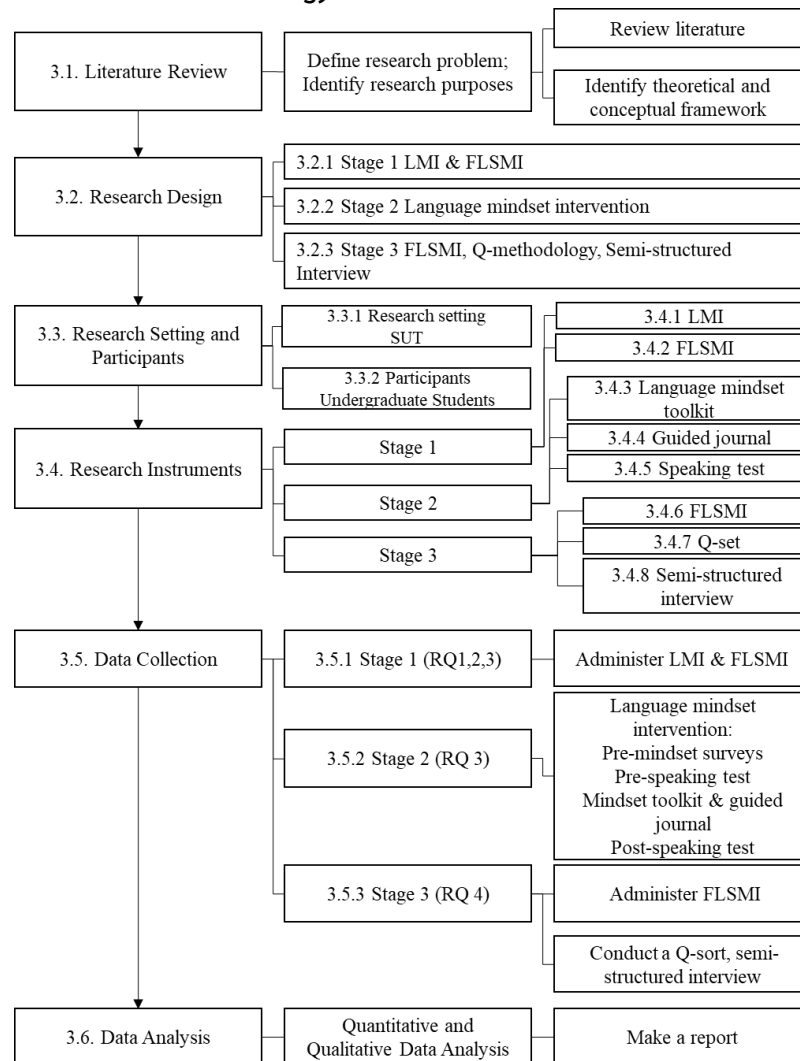
## 3.1 Flow Chart of Methodology



Figure 3.1 Flow Chart of Methodolog

Figure 3.1 presented an overview of the research methodology employed in this study. The diagram outlines the research process including literature review, research design, research setting and participants, instruments, data collection procedures, and data analysis. The figure illustrated how the study was structured across three main stages. This visual representation provided a clear roadmap of how the study was systematically conducted to address the research purposes.

## 3.2 Research Design

The aim of the current study is to investigate the language and foreign language speaking mindsets of Thai undergraduate students. In addition to exploring the mindsets, the study seeks to establish relationships among language mindset, foreign language speaking mindset, and speaking performance of Thai undergraduate students, as well as to examine the learning variables related to foreign language speaking mindsets of the undergraduate students. Finally, the study aims to examine the dynamic nature of the foreign language speaking mindset among Thai undergraduate students over time.

The study employed a mixed-methods research design that incorporates both quantitative and qualitative methodologies. With regard to the purposes and research questions of the study, the four aims and corresponding questions were pursued throughout three stages of the study. Table 3.1 presented the research design and showed the research purposes and research questions with the stages that corresponded to each question.

**Table 3.1 Research Design**

| Research Purposes | Research Questions | Stages of the study |
|---|---|---|
| 1. To investigate Thai undergraduate students' language mindset and foreign language speaking mindset. | 1. What are the language mindset and foreign language speaking mindset of Thai undergraduate students? | Stage 1 Language Mindset and Foreign Language Speaking Mindset Surveys |
| 2. To know the factors associated with foreign language speaking mindset of Thai undergraduate students. | 2. What are the factors related to foreign language speaking mindset among Thai undergraduate students? | Stage 1 Language Mindset and Foreign Language Speaking Mindset Surveys |
| 3. To determine the relationship between and among language mindset, foreign language speaking mindset, and speaking performance of Thai undergraduate students. | 3. What are the relationships among language mindset, foreign language speaking mindset, and speaking performance of Thai undergraduate students? | Stage 2 Language Mindset Intervention |
| 4. To understand the dynamic nature of foreign language speaking mindset of Thai undergraduate students over time. | 4. Does foreign language speaking mindset among Thai undergraduate students change over time, and if so, what is the nature of this change? | Stage 2 Language Mindset Intervention Stage 3 Foreign Language Speaking Mindset Survey, Q-Methodology, and Semi-Structured Interview |

Table 3.1 outlined how the study's purposes connect with the research questions and the methodological stages. Each stage was planned to address the specific aim of the study. The following section explains each stage of the study in detail.

### 3.2.1 Stage 1 Language Mindset and Foreign Language Speaking Mindset Surveys

The first stage used a quantitative approach to examine learners' language mindsets, foreign language speaking mindsets, and related learning variables. In the current study, the researcher used the data gathered from surveys to establish the linear correlations between language mindset and foreign language speaking mindset, as well as the connections between speaking performance and foreign language speaking mindset. Both the language mindset survey and the foreign language speaking mindset survey were distributed electronically via online (Google Form) surveys. The reason for implementing a survey is grounded in its suitability as a tool for assessing the language mindset and foreign language speaking mindset of undergraduate students. Additionally, the use of survey data enables the researcher to draw inferences (Lankshear & Knobel, 2004) regarding the language mindset, foreign language speaking mindset, and their connection with the learning variables that underpin the meaning-making process of undergraduate students. The survey results of this stage provided insights for answering research questions 1) What are the language mindset and foreign language speaking mindset of Thai undergraduate students? and 2) What are the factors related to foreign language speaking mindset among Thai undergraduate students?

### 3.2.2 Stage 2 Language Mindset Intervention

The second stage employed a language mindset intervention to explore the effects of a mindset intervention and related learning variables. The intervention was applied to achieve the following objectives: seek for the insight of a foreign language speaking mindset, identify the interplay between foreign language speaking mindsets and the learning variables of the undergraduate students, determine the relationship between the learning variables and foreign language speaking mindset, and investigate the dynamic nature of foreign language speaking mindset over time. At this stage, the pre-speaking test was carried out prior to the mindset intervention, and the post-speaking test was conducted subsequent to the conclusion of the mindset intervention.

These measurements were conducted to assess changes in mindset change before and after the intervention. The purpose of the speaking test is to assess the speaking performance of undergraduate students. This test enables the researcher to

both evaluate the speaking performance of undergraduate students and establish a connection between the learning trajectory of students' foreign language speaking skills and their mindset. The mindset toolkit was utilized as an instrument. By utilizing an intervention, the researcher can investigate the effects of mindset intervention on the language mindset and foreign language speaking mindset of undergraduate students in an English language classroom setting since conducting a true experimental design in a classroom setting can be impractical (Cohen et al., 2007), as it may be challenging to randomize the provision of a mindset intervention to specific groups of Thai undergraduate students given constraints of time and context. The guided journals were provided to students as a tool for reflecting on their understanding of mindsets and identifying potential applications of this knowledge to their foreign language speaking. The outcomes of this stage will provide insights for answering research questions 3) What are the relationships among language mindset, foreign language speaking mindset, and speaking performance of Thai undergraduate students?? and 4) Does foreign language speaking mindset among Thai undergraduate students change over time, and if so, what is the nature of this change?

### 3.2.3 Stage 3 Foreign Language Speaking Mindset Survey, Q-Methodology, and Semi-Structured Interview

The third stage applied a mixed-method to gain a deeper understanding of the evolution of foreign language speaking mindset. At this stage, the researcher administered the foreign language speaking mindset inventory, in addition to conducting semi-structured interviews. Prior to conducting the interview, the researcher utilized Q-methodology, a systematic approach that enables the researcher to discern the subjective viewpoints of the participants (Bartlett & DeWeese, 2015). Through the application of this approach, the researcher was able to identify shared perceptions among participants, as well as how they make meaning with respect to their mindset. The semi-structured interview afforded the researcher the opportunity to explore students' foreign language speaking mindset and gain insight into their perspective, thus enabling the development of relevant concepts (Lankshear & Knobel, 2004). Furthermore, the survey provided data for the comparative analysis of changes in students' mindset over time. The outcomes of this stage provided insights for answering research question 4) Does foreign language speaking mindset among Thai undergraduate students change over time, and if so, what is the nature of this change?

## 3.3 Research Setting and Participants

### 3.3.1 Research Setting

The study was conducted at Suranaree University of Technology, Nakhon Ratchasima, Thailand, which has a diverse undergraduate student population. However, it is essential to note that a significant proportion of the student body demonstrates low language proficiency, as indicated by their English Placement Test scores. This diversity offers unique research setting for exploring language-related issues. The data collection period was approximately eight weeks. The data were collected from the English for Communication course, which is designed with the objectives of enhancing students' communication abilities, fostering their speaking skills, and promoting their learning autonomy. Consequently, the researcher can ascertain that the course content aligns with the research objectives in terms of investigating the foreign language speaking mindset of students and the relationship between their mindset and speaking skills. Additionally, data collection took place in the university's co-working space, a dynamic location where students often engage in collaborative learning. The SUT co-working space offers two meeting rooms accommodating 10-15 individuals, equipped with tables, chairs, lighting, air-conditioning, and audio-visual equipment suitable for research activities. Additionally, the co-working space's convenient location within the university campus facilitates ease of access for undergraduate students.

### 3.3.2 Research Participants

The participants in the study were undergraduate students who enrolled in the university's fundamental English course (English for Communication I & II), as the main objectives of the course require active participation in classroom listening and speaking activities. Access to undergraduate students enrolled in the English for Communication I and II courses is advantageous to the study, as it enables investigation of students' foreign language speaking mindset and enhances the feasibility of the research. In addition, regarding Piaget's theory of cognitive development, students transitioning to tertiary education are believed to be in the formal operational stage of cognitive development, characterized by the use of abstract reasoning in understanding the world (Huitt & Hummel, 2003). Therefore, it may be assumed that the undergraduate students in these courses present a critical period for the development of students' growth mindset with respect to language learning and foreign language speaking.

### 3.3.3 Sampling Methods and Number of the Participants

### 3.3.3.1 Stage 1 Language Mindset and Foreign Language Speaking Mindset Surveys

For the language mindset inventory and the foreign language speaking mindset inventory, participants were selected using a convenience sampling technique in the present study. There were 894 participants who participated in the survey.

**Table 3.2 Demographic Information of the Participants in Stage 1**

|  |  | N | Percentage |
|---|---|---|---|
| Gender | Male | 346 | 38.70 |
|  | Female | 530 | 59.30 |
|  | Rather not say | 18 | 2.00 |
| Year | Year 1 | 841 | 94.06 |
|  | Year 2 | 42 | 4.70 |
|  | Year 3 | 4 | .45 |
|  | Year 4 | 3 | .34 |
|  | Year 5 | 1 | .11 |
|  | Year 6 up | 3 | .34 |
| Major | Chemistry | 17 | 1.90 |
|  | Mathematics | 7 | .78 |
|  | Biology | 18 | 2.00 |
|  | Physics | 7 | .78 |
|  | Remote Sensing | 2 | .22 |
|  | Microbiology | 10 | 1.12 |
|  | Sports Science | 10 | 1.12 |
|  | Anatomy | 1 | .11 |
|  | Pharmacology | 3 | .34 |
|  | General Education | 2 | .22 |
|  | Information Technology | 26 | 2.91 |
|  | Management Technology | 3 | .34 |
|  | Crop Production Technology | 36 | 4.03 |
|  | Animal Production Technology | 90 | 10.07 |
|  | Food Technology | 9 | 1.01 |
|  | Public Health | 64 | 7.16 |
|  | Occupational Health and Safety | 3 | .34 |
|  | Dentistry | 2 | .22 |
|  | Manufacturing Engineering | 3 | .34 |
|  | Agricultural Engineering | 3 | .34 |
|  | Transportation Engineering | 2 | .22 |
|  | Chemical Engineering | 3 | .34 |
|  | Mechanical Engineering | 3 | .34 |
|  | Ceramic Engineering | 2 | .22 |
|  | Polymer Engineering | 2 | .22 |

Table 3.2 Demographic Information of the Participants in Stage 1 (Cont.)

|  |  | N | Percentage |
|---|---|---|---|
| Gender | Male | 346 | 38.70 |
|  | Electrical Engineering | 2 | .22 |
|  | Civil Engineering | 7 | .78 |
|  | Metallurgical Engineering | 1 | .11 |
|  | Environmental Engineering | 2 | .22 |
|  | Geotechnology | 2 | .22 |
|  | Electronic Engineering | 3 | .34 |
|  | Automotive Engineering | 11 | 1.23 |
|  | Mechatronics | 16 | 1.79 |
|  | Not specified (Engineering) | 407 | 45.53 |
|  | Digital Communication Arts | 52 | 5.82 |
|  | Other | 63 | 7.05 |
| Perceived language proficiency | Beginner | 855 | 95.60 |
|  | Intermediate | 25 | 2.80 |
|  | Advanced | 14 | 1.60 |

The participant demographics reflected a diverse group in terms of gender, academic year, field of study, and self-reported English proficiency. Most participants were female (530 participants, 59.30%) and primarily first-year students (841 participants, 94.07%). Engineering was the most represented field, with 469 participants (52.46%) enrolled in engineering programs, followed by agricultural technology (135 participants, 15.11%) and science (69 participants, 7.72%). In terms of perceived English language proficiency, the majority of students (855 participants, 95.6%) identified themselves as beginners. A smaller group of 25 students (2.8%) reported intermediate proficiency, and only 14 students (1.6%) considered themselves advanced. The researcher asked for permission from the School of Foreign Languages, Suranaree University of Technology, to access students who enrolled in English for Communication courses. This request was made in writing and preceded all stages of data collection.

### 3.3.3.2 Stage 2 Language Mindset Intervention

The purposive sampling method was used in mindset intervention stage, given that the participants should be first-year undergraduate students enrolled in the English for Communication course. In line with the study's goals, it is beneficial for the participants to have undergone formal education in Thailand and be in the stage of developing formal operational thinking. Additionally, considering the constraints of accessibility, time, and budget, the most accessible group for the study consisted of the aforementioned students.

**Table 3.3 Demographic Information of the Participants in Stage 2**

|  |  | N |
|---|---|---|
| Language mindset intervention | All sessions | 42 |
|  | Some sessions | 6 |
| Speaking test | Participate in speaking test and complete the survey | 42 |
|  | Participate in speaking test | 48 |
| Guided journal | All sessions | 37 |
|  | Some sessions | 5 |

The number of participants in the Language Mindset Intervention was 42 participants. This number reflected the participants who fully completed two steps of the language mindset intervention, including the pre- and post-surveys and the pre- and post-speaking tests. The students were provided with the mindset video instruction during a warm-up period of the English for Communication class, and they received the guided journal as their classroom assignments. Initially, 42 participants voluntarily completed the journal. However, five participants were unable to complete all six journals. Therefore, only 37 journals were included in the dataset. Regarding the speaking test, there were 48 participants who had performed both the pre- and post-speaking test. However, there were 42 participants who volunteered to do the pre- and post- language mindset inventory and foreign language speaking mindset inventory. Hence, the six participants were eliminated from the data analysis for examining the relationship among language mindset, foreign language speaking mindset, and speaking performance. The researcher had taken measures to ensure that the mindset video instruction and guided journal will benefit the students in their language learning, based on prior empirical evidence related to mindset and second language learning interventions (Lanvers, 2020; Al-Murtadha, 2025).

### 3.3.3.3 Stage 3 Foreign Language Speaking Mindset Survey, Q-Methodology, and Semi-Structured Interview

The purposive sampling was used in this stage, whereby at least three participants were selected from various subgroups based on their mindsets. The participants were asked to volunteer for the semi-structured interview. There were three subgroups of the participants regarding foreign language speaking mindsets namely, strong fixed mindset, weak fixed and weak growth mindset, and strong growth mindset. The number of participants in this stage was 19 individuals.

Table 3.4 Demographic Information of the Participants in Stage 3

|  |  | N |
| --- | --- | --- |
| Mindset | Strong fixed mindset | 3 |
|  | Weak fixed and weak growth mindset | 9 |
|  | Strong growth mindset | 7 |

## 3.4 Research Instruments

This study employs six research instruments, namely, the Language Mindset Inventory (LMI), the Foreign Language Speaking Mindset Inventory (FLSMI), Language Mindset Toolkit, Guided Journals, Speaking Test, Q-set, and a semi-interview. During the first stage of the study, the LMI and FLSMI were administered. In the second stage, language mindset toolkit, guided journals were utilized, and speaking test was performed. In the third stage, the LMI and FLSMI were administered again, while the Q-set and a semi-interview were employed to collect subjective data from the participants. Detailed descriptions of each instrument are provided below.

**a) Stage 1 Language Mindset and Foreign Language Speaking Mindset Surveys**

**3.4.1 Language Mindset Inventory (LMI)**

Three items from the Language Mindset Inventory (Lou & Noels, 2019) were employed to measure the language mindset of Thai undergraduate students. The inventory comprises 18 items that use a 6-point rating scale, with responses ranging from 1 (Strongly Disagree) to 6 (Strongly Agree). The inventory encompasses three sections pertaining to three dimensions of second language acquisition: general language intelligence, second language aptitude, and critical/sensitive period hypothesis. Each of the three parts comprises six items and will be translated into Thai. The back translation method will serve as a documentation tool (Son, 2018) since the primary participants of the investigation are freshmen at Suranaree University of Technology.

Regarding the validity of the Language Mindset Inventory (LMI), previous research by Lou and Noels (2017) conducted a statistical analysis to establish the suitability of the instrument for assessing students' language mindset. To determine the internal structure of the inventory, Confirmatory Factor Analysis (CFA) was employed, testing various models with different numbers of factors, including a 1-factor, 2-factor, 3-factor, and 6-factor model. The results indicated that the 6-factor model exhibited the highest potential and was the most appropriate for discerning students' growth and fixed beliefs. Strong correlations were observed within the growth factors ($r = .88, .92, .94$), as well as within the fixed factors ($r = .73, .78, .89$), while weak

correlations were observed between the growth factors and fixed factors (r = -.56, -.59, -.61, -.64, -.68, -.71, and -.77). Subsequently, a Hierarchical Confirmatory Factor Analysis (HCFA) was conducted to further explore the internal structure of the Language Mindset Inventory (LMI). The results indicated that a 2nd-order model provided an acceptable fit and was appropriate for elucidating the covariation among the factors. Notably, a strong negative correlation was observed between the growth factor and the fixed factor (r = -.78), supporting the theoretical framework. To assess the validity of the LMI, Lou and Noels (2017) employed the known-groups technique, where they hypothesized that students who held beliefs in the malleability of their language abilities would be more likely to enroll in a language course. The results indicated that students who were enrolled in a language course exhibited stronger growth beliefs (F(1,1583) = 4.26, p = .01, $n^2$ = .004) compared to those who were not enrolled. This finding supports the notion that a stronger growth mindset is associated with a higher likelihood of pursuing language courses in the future, aligning with the underlying mindset meaning system that emphasizes the positive impact of a growth mindset on students' engagement within academic settings. Regarding the reliability assessment, Lou and Noels (2017) conducted a test-retest correlation analysis using data obtained from 117 students. The findings revealed a significant correlation of 0.71, indicating satisfactory reliability of the inventory. However, further investigations into the psychometric properties of the inventory were deemed necessary, as the assessment of its overall psychometric soundness remained inconclusive, prompting subsequent studies to delve deeper into this aspect.

In Study 2, one-way ANOVAs were conducted to provide evidence of the validity of the Language Mindset Inventory (LMI) based on test content. The analysis of the data revealed a consistent pattern wherein participants whose responses to the open-ended questions reflected stronger fixed beliefs obtained higher scores on the fixed beliefs subscale of the LMI. Similarly, participants whose responses indicated stronger growth beliefs received higher scores on the growth beliefs subscale of the LMI. Furthermore, the study investigated the relationships between language mindset and other variables, such as math ability, athletic performance, and general intelligence. The findings indicated that language mindset was distinct from these variables, demonstrating the specificity of the LMI in measuring language mindset.

In terms of interpreting the scores on the Language Mindset Inventory (LMI), participants are required to rate their level of agreement on six statements across three dimensions: general language intelligence, second language aptitude, and critical/sensitive period hypothesis. The rating scale ranges from 1 (Strongly Disagree)

to 6 (Strongly Agree). The scoring and interpretation of the LMI can be summarized as follows: For each dimension, participants who score between 12 and 18 points after responding to the fixed belief statements will be classified as endorsing a fixed language mindset. On the other hand, participants who score between 12 and 18 points after responding to the growth belief statements will be classified as endorsing a growth language mindset. This scoring and interpretation approach enables the identification of participants' alignment with either fixed or growth language mindsets across the specific dimensions of the LMI.

### 3.4.2 Foreign Language Speaking Mindset Inventory (FLSMI)

The 21-item Foreign Language Speaking Mindset Inventory (FLSMI) was developed drawing upon the theoretical framework of Lou and Noels' (2019) language mindset meaning-making system. The present model explicates the complicated interplay between language mindsets and the six learning variables that underpin the process of meaning-making. Thus, the Foreign Language Speaking Mindset Inventory endeavors to comprehensively assess the six key learning variables that encompass effort (2 items), attribution (3 items), achievement goals (4 items), failures/mistakes beliefs (2 items), self-regulatory tendency (3 items), and competence-based emotions (4 items). The inventory comprises two sections, namely, the General Information section and the Foreign Language Speaking Mindset Inventory section. During the development of the questionnaire items, a rigorous examination of secondary data and extensive review of relevant literature were conducted. The items contained in each subsection of the FLSMI are either adapted from or written based on the conceptual underpinnings of the language mindset meaning-making system (see Chapter 2). The development of the survey items was presented in Figure 3.2.

Figure 3.2 provided an overview of the development process of the survey instrument used in the study. It summarized the key steps from the initial literature review to the final item revision after the pilot study. The figure presented the theoretical sources and the corresponding item numbers for each construct. A more detailed explanation of the process is provided.
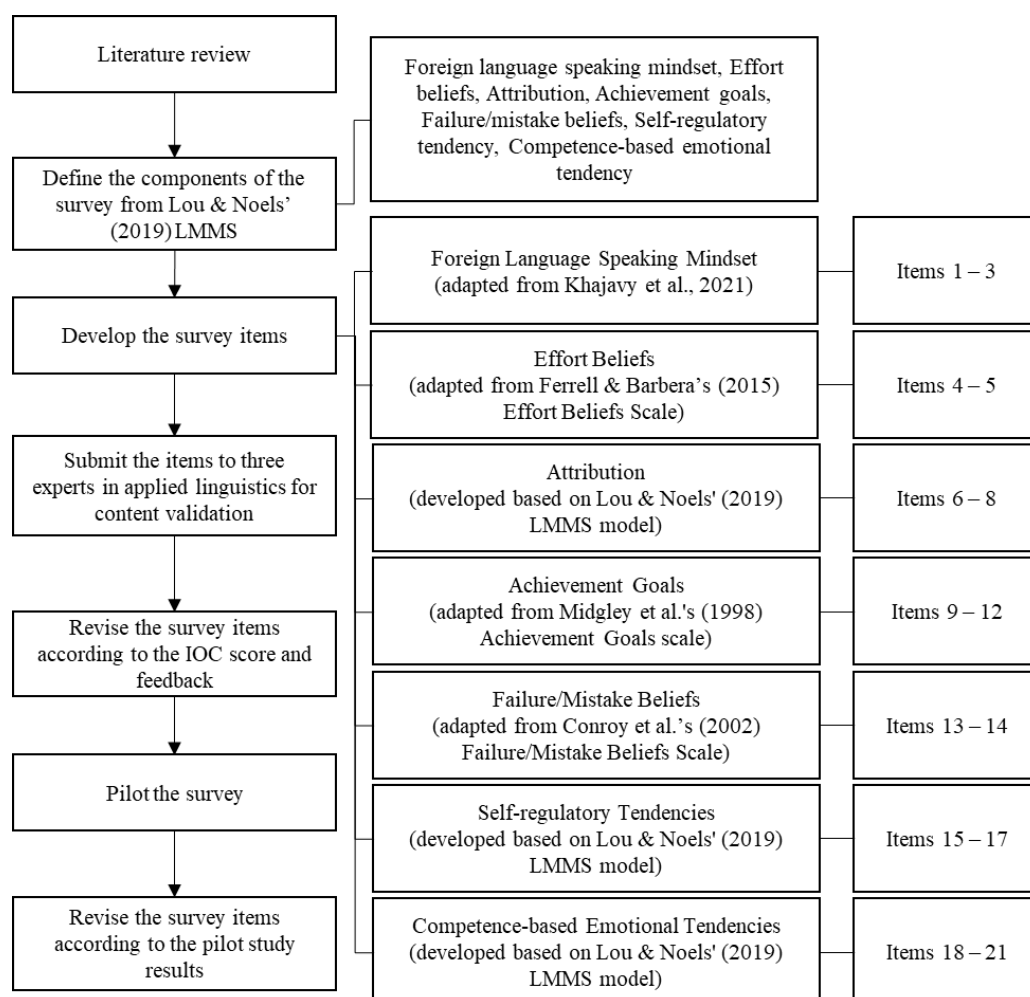
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┌─────────────────────┐        ┌──────────────────────────────────┐
│  Literature review  │        │ Foreign language speaking mindset, │
└─────────────────────┘        │ Effort beliefs, Attribution,       │
          │                    │ Achievement goals, Failure/mistake │
          ▼                    │ beliefs, Self-regulatory tendency, │
┌─────────────────────┐        │ Competence-based emotional         │
│ Define the components│       │ tendency                           │
│ of the survey from   │       └──────────────────────────────────┘
│ Lou & Noels'         │
│ (2019)LMMS           │
└─────────────────────┘
          │
          ▼
┌─────────────────────┐        ┌──────────────────────────────┐   ┌──────────────┐
│ Develop the survey   │       │ Foreign Language Speaking     │   │ Items 1 – 3  │
│ items                │       │ Mindset (adapted from         │   └──────────────┘
└─────────────────────┘       │ Khajavy et al., 2021)         │
          │                   └──────────────────────────────┘
          ▼                   ┌──────────────────────────────┐   ┌──────────────┐
┌─────────────────────┐       │ Effort Beliefs (adapted from  │   │ Items 4 – 5  │
│ Submit the items to  │       │ Ferrell & Barbera's (2015)    │   └──────────────┘
│ three experts in     │       │ Effort Beliefs Scale)         │
│ applied linguistics  │       └──────────────────────────────┘
│ for content          │       ┌──────────────────────────────┐   ┌──────────────┐
│ validation           │       │ Attribution (developed based  │   │ Items 6 – 8  │
└─────────────────────┘       │ on Lou & Noels' (2019) LMMS   │   └──────────────┘
          │                   │ model)                        │
          ▼                   └──────────────────────────────┘
┌─────────────────────┐       ┌──────────────────────────────┐   ┌──────────────┐
│ Revise the survey    │       │ Achievement Goals (adapted    │   │ Items 9 – 12 │
│ items according to   │       │ from Midgley et al.'s (1998)  │   └──────────────┘
│ the IOC score and    │       │ Achievement Goals scale)      │
│ feedback             │       └──────────────────────────────┘
└─────────────────────┘       ┌──────────────────────────────┐   ┌──────────────┐
          │                   │ Failure/Mistake Beliefs       │   │ Items 13 – 14│
          ▼                   │ (adapted from Conroy et al.'s │   └──────────────┘
┌─────────────────────┐       │ (2002) Failure/Mistake        │
│  Pilot the survey    │       │ Beliefs Scale)                │
└─────────────────────┘       └──────────────────────────────┘
          │                   ┌──────────────────────────────┐   ┌──────────────┐
          ▼                   │ Self-regulatory Tendencies    │   │ Items 15 – 17│
┌─────────────────────┐       │ (developed based on Lou &     │   └──────────────┘
│ Revise the survey    │       │ Noels' (2019) LMMS model)     │
│ items according to   │       └──────────────────────────────┘
│ the pilot study      │       ┌──────────────────────────────┐   ┌──────────────┐
│ results              │       │ Competence-based Emotional    │   │ Items 18 – 21│
└─────────────────────┘       │ Tendencies (developed based   │   └──────────────┘
                              │ on Lou & Noels' (2019) LMMS   │
                              │ model)                        │
                              └──────────────────────────────┘
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**Figure 3.2 The Development Process of FLSMI**

Initially, the Foreign Language Speaking Mindset Inventory (FLSMI) comprised a set of 59 statements. The first section of the Foreign Language Speaking Mindset Inventory comprised a total of five items, which used a combination of closed-ended and open-ended questions to elicit general information from participants. Specifically, the section aimed to obtain data on participants' gender, year of study, major of study, perceived level of language proficiency, and perceived level of proficiency in English speaking. The items were as follows:

1. *What is your gender?*
2. *What is your current year of study?*
3. *What is your major of study?*
4. *What is your English language proficiency level according to the Common European Framework of Reference (CEFR)?*
5. *What is your perceived English language proficiency in speaking?*

The second section of the inventory comprised a total of 55 items and used a 6-point rating scale with responses ranging from 1 (Strongly Disagree) to 6 (Strongly Agree). A 6-point rating scale was employed to align this instrument with the language mindset inventory which also used 6-point rating scale. Additionally, the survey scale without a neutral midpoint was intended to encourage the participants to indicate a clear position of agreement or disagreement. This section is comprised of seven subsections that aim to measure various constructs, as follows:

1) Foreign Language Speaking Mindset: This subsection consisted of six items, adapted from Khajavy et al.'s (2022) reading mindset items, designed to measure participants' mindset regarding their foreign language speaking abilities. According to the measurement, a growth foreign language speaking mindset refers to a belief that speaking ability is able to improve. A fixed foreign language speaking mindset refers to a belief that speaking ability is unable to improve. The items were as follows:

*1. No matter how intelligent I am, I can always improve my speaking.*

*2. The more I try to learn speaking skills, the better I become.*

*3. I can learn the necessary skills to speak English by doing enough practice.*

*4. As a language learner, I have limited aptitude to speak English and I cannot do anything to change and improve that.*

*5. Just a few people are capable of learning and improving their speaking and these people were born with this capacity and I am not one of them.*

*6. To be honest, I don't think I can improve my speaking skills.*

The rationale behind formulating the items to measure the foreign language speaking mindset based on Khajavy et al.'s (2022) study is rooted in their objective of conceptualizing a reading mindset. Additionally, it is crucial to explore whether mindset is a construct specific to certain domains. Consequently, employing these items may facilitate the differentiation between a general language mindset and a specific foreign language speaking mindset.

2) Effort: This subsection consisted of nine items, adapted from Ferrell and Barbera's (2015) Effort Beliefs Scale, designed to measure students' perceptions regarding the role of effort in their foreign language speaking learning process. Moreover, Item 7 and Item 12 aligned with the variables examined in Wilang's (2021) study on the mindset of the high school students. According to the measurement, the construct of effort refers to how students perceive the role of effort in their acquisition of foreign language speaking skills. Specifically, students exhibiting a growth speaking

mindset consider effort to be crucial in improving their speaking ability, believing that they can enhance their skills through hard work. In contrast, those with a fixed speaking mindset tend to believe that putting in effort will not lead to any significant improvement and may view doing so as an indication of their lack of natural talent in learning to speak English. The definition of these constructs is drawn from Lou and Noels' (2019) theoretical framework. The items were as follows:

> 7. *To tell the truth, when I work hard at improving my speaking, it makes me feel like I'm not very smart.*
>
> 8. *It doesn't matter how hard I try if I am not smart in language, I won't do well in speaking.*
>
> 9. *If I am not good at speaking, practicing hard won't make me good at it.*
>
> 10. *If speaking is hard for someone, it means that he or she probably won't be able to do really well at it.*
>
> 11. *If I'm not doing well at speaking, it's better to try something easier.*
>
> 12. *When speaking is hard, it just makes me want to practice more on it, not less.*
>
> 13. *If I don't practice and put in a lot of effort in speaking, I probably won't do well.*
>
> 14. *The harder I practice, the better I will be at speaking.*
>
> 15. *If a speaking task is hard, it means I'll probably learn a lot doing it.*

The reason for adapting the items from Ferrell and Barbera's (2015) study stems from their specific focus on investigating students' effort beliefs. Their study utilized items derived from the effort belief scales developed by Blackwell (2002), which have been employed to conceptualize the role of mindset in mediating students' transition from high school to tertiary education. Therefore, the items from Ferrell and Barbera appeared suitable for inclusion in the current study, given their alignment with the research objectives.

3) Attribution: This subsection consisted of six items that were developed based on Lou and Noels' (2019) Language Mindset Meaning-Making System model, aimed at measuring students' perceptions regarding the underlying factors that contribute to their foreign language speaking outcomes. According to the measurement, attribution refers to how students perceive the underlying causes of their success or failure in foreign language speaking. Students who demonstrate a growth speaking mindset tend to believe that their foreign language speaking outcomes are controllable and can be improved through effort. They may view mistakes or

failures as an indication of inadequate effort on their part. Conversely, students with a fixed speaking mindset tend to perceive their outcomes as beyond their control and believe that improvement in their speaking ability is solely dependent on natural talent. They may view mistakes or failures as a result of their lack of talent. These constructs are defined based on Lou and Noels' (2019) theoretical framework. The items were as follows:

> 16. I can improve to speak English well because I have a natural talent in learning languages.
> 17. I may need a special talent to be able to speak English well.
> 18. I find it hard to speak English well because I am not good at learning languages.
> 19. I may be able to speak English well if I practice hard.
> 20. I may be able to speak English well if I put a lot of effort in speaking.
> 21. I may be able to speak English well if I get more time for practicing.

4) Achievement Goals: This subsection consisted of 13 items adapted from Midgley et al.'s (1998) Achievement Goals scale, designed to measure students' goals in learning foreign language speaking. Moreover, Item 29 and Item 32 aligned with the variables examined in Wilang's (2021) study on the mindset of the high school students. According to the measurement, the achievement goals refer to the objectives that students aim to achieve in their foreign language speaking. Specifically, students with mastery goals strive to enhance and refine their foreign language speaking ability. Conversely, students with performance goals may seek to outperform their peers with high-perceived foreign language proficiency or avoid being perceived as incompetent in foreign language speaking due to the fear of negative judgment, particularly those with low-perceived foreign language proficiency. These definitions are in accordance with Lou and Noels' (2019) theoretical framework. The items were as follows:

> 22. I like speaking task that I will learn from, even though I make a lot of mistakes.
> 23. An important reason I do my speaking task is because I like to learn new speaking skills.
> 24. I like speaking task best when it really makes me think.
> 25. An important reason I do my speaking task is because I want to get better at it.
> 26. I do my speaking task because I am interested in it.
> 27. I want to speak English better than the others in my classes.

28. *I like to show my lecturers that I can speak English better than the other students in my classes.*

29. *Speaking English better than other students in my classes is important to me.*

30. *The reason I do speaking task in my English classes is so that others in the class won't think that I am dumb.*

31. *One reason I might not participate in speaking activities in my classes is to avoid looking dumb.*

32. *One of my main goals in my English classes is to avoid looking like I can't do my speaking task.*

33. *It's very important to me that I don't look stupid when I speak or when I try to speak English in my classes.*

34. *An important reason I do my speaking task is so I won't embarrass myself.*

5) Failures/Mistakes: This subsection consisted of five items that were adapted from Conroy et al.'s (2002) Failures/Mistakes scale, designed to measure students' perception of possible failures and mistakes in foreign language speaking. According to the measurement, failure/mistake refers to how students view their failure/mistake. Students with a growth L2 speaking mindset view failures and mistakes are controllable. Failures and mistakes in speaking are indications that they lack effort or lack appropriate learning strategies. Students with a fixed L2 speaking mindset view failures and mistakes are uncontrollable. Failures and mistakes in speaking are indications that they lack natural ability to learn language and to speak English. These definitions are in accordance with Lou and Noels' (2019) theoretical framework. The items were as follows:

35. *When I am failing in speaking, I am afraid that I might not have enough talent in language learning.*

36. *When I am failing in speaking English, I expect to be criticized by my friends and my English teachers.*

37. *When I am failing in speaking, it means that I have to put more effort to improve my speaking.*

38. *When I am failing in speaking English, I expect to get feedback to improve my speaking.*

39. *When I am failing* in speaking, I worry about what others think about me.

The Fear of Failure Inventory, as devised by Conroy et al. (2002), constituted a multidimensional instrument aimed at assessing fear of failure. The outcomes obtained through this measurement allowed for the characterization of participants' fear of failure based on their self-perceptions. Such self-estimation could be associated with attributional processes and the growth and fixed sub-system within the language mindset meaning-making system.

6) Self-regulatory Tendency: This subsection consisted of eight items that were formulated based on Lou and Noels' (2019) Language Mindset Meaning-making System model, aiming to measure students' self-regulation strategies when confronted with setbacks in foreign language speaking. Moreover, Item 41 aligned with the variables examined in Wilang's (2021) study on the mindset of the high school students. Drawing on Lou and Noels' (2019) theoretical framework, students with a growth speaking mindset tend to actively seek out better learning strategies and feedback to improve their foreign language speaking skills. In contrast, students with a fixed speaking mindset tend to avoid challenging speaking tasks that may lead to criticism, and they may perceive feedback as an indicator of their incompetence. The items were as follows:

*40. I don't have to seek for learning strategies, I am good at speaking.*

*41. I wouldn't like feedback on my speaking when I speak.*

*42. Practice speaking is a waste of time if I do not have the talent in speaking.*

*43. Speaking is something I can't do on my own.*

*44. I try to seek for learning strategies to improve my speaking.*

*45. I would like feedback on my speaking to make my speaking better.*

*46. Practice speaking on my own can make me get better at speaking.*

*47. Speaking is something I can do by myself.*

7) Competence-based Emotional Tendency: This subsection consisted of eight items, which are based on Lou and Noels' (2019) Language Mindset Meaning-making System model, designed to measure students' emotional responses when engaging in foreign language speaking. Based on Lou and Noels' (2019) theoretical framework, competence-based emotional tendency refers to the emotions that students tend to feel about their foreign language speaking ability. Students with a growth speaking mindset tend to experience less anxiety and more positive emotions when they have to speak a foreign language. Conversely, students with a fixed speaking mindset tend to experience more anxiety and fewer positive emotions when they have to speak in a foreign language. The items were as follows:

48. *I am afraid to speak English without preparation in my English classes.*

49. *I feel nervous when I have to speak English in front of my teacher and classmates.*

50. *I worry of making mistakes when I speak English.*

51. *I am afraid people will not understand me when I speak English.*

52. *I am eager to speak English in my English classes.*

53. *I feel comfortable when I speak English in front of my teacher and classmates.*

54. *I don't worry that I may make some mistakes when I speak English.*

55. *Even people don't understand when I speak, I am not afraid to speak English.*

### 3.4.2.1 The validation of Foreign Language Speaking Mindset Inventory

The foreign language speaking mindset inventory (FLSMI) has undergone a validation process prior to its administration to the participants of the study. Content validation was conducted through the use of Item Objective Congruence (IOC). The preliminary version of the inventory was submitted to three IOC committees on different occasions, resulting in a process that resembles an iterative validation process, involving multiple phases of validation (Sondergeld & Johnson, 2019).

The items were first submitted to the initial IOC committee and were subsequently revised based on feedback before being submitted to the remaining committees. Three experts with expertise in the applied linguistic field were tasked with evaluating the validity of the items. The IOC score of each item was then calculated using Lynn's (1986) criteria, which suggests that at least three experts are needed for content validation. Additionally, Brown (2005) recommended a cutoff value of greater than 0.50 as acceptable. A score of less than 0.50 indicated that the item required further adjustment.

In relation to the General Speaking Mindset subsection, the findings suggested that one item, specifically Item 6 (.33), should undergo further revision. Within the Effort subsection, the results indicated a need for revision of two items, namely Item 10 (.44) and Item 11 (.00). Regarding the Attribution subsection, the findings suggested that four items, namely Item 16 (.33), Item 19 (.00), Item 20 (.00), and Item 21 (.33), should be revised. Within the Speaking of Achievement Goals subsection, it was suggested that three items, namely Item 27 (.33), Item 28 (.33), and Item 34 (.33), undergo revision. Similarly, in the context of the Failure/Mistakes

subsection, the results suggested the revision of three items, namely Item 35 (.33), Item 36 (.33), and Item 38 (.33). Additionally, within the Self-regulatory Tendencies subsection, it was recommended that three items, namely Item 30 (.33), Item 41 (.33), and Item 44 (.33), be revised. Lastly, with regards to the Competence-based Emotional Tendencies subsection, the results indicated that one item, namely Item 45 (.33), should undergo further revision (see Appendix B).

Following the revisions based on the feedback from the three experts, the total number of items in the Foreign Language Speaking Mindset Inventory section was reduced to 42 (see Appendix B). All questionnaire items were translated into Thai, and the back-translation method was used as a documentation tool (Son, 2018). This was deemed necessary as the primary participants in the study were Thai freshmen at the university in the Northeastern Part of Thailand.

**3.4.2.2 Reliability of the Foreign Language Speaking Mindset Inventory items**

After the revision, the Foreign Language Speaking Mindset Inventory underwent a pilot study to test its reliability. The results of the pilot study indicated that the items were reliable. Cronbach's alpha coefficient for Foreign Language Speaking Mindset Inventory is 0.85, suggesting that the items have relatively high internal consistency (Cohen, Manion, & Morrison, 2007).

**3.4.2.3 Correlation of the items in the Foreign Language Speaking Mindset Inventory**

The average inter item correlation of the Foreign Language Speaking Mindset Inventory is 0.12 which suggested that the items have a low discrimination level. The items might be too redundant. To revise the survey, the item-rest correlation was performed to find the items that should be eliminated or adjusted. The results suggested that item 14, 20, 21, 22, 24, 30, 36, 37, 38, and 40 (10 items) should be eliminated or adjusted.

After removing the items that have value less than 0.2 from the analysis, The Cronbach's alpha coefficient for 32 items is 0.91. suggesting that the items have relatively high internal consistency (Cohen, Manion, & Morrison, 2007). The average interitem correlation of the speaking mindset inventory is 0.231 which suggested that the items have average discrimination level. Following the revision of the piloted items, the number of items remain 21. This decision was made based on the statistical analysis to eliminating the 21-item.

### 3.4.2.4 Technical aspects of the survey

### The formats and language of the survey

In addition to completing the Foreign Language Speaking Mindset Inventory, participants in the pilot study also responded to questions regarding the technical aspects of the survey. The findings revealed that respondents found the instructions to be clear and the survey easy to navigate. Nevertheless, approximately half of the participants noted that there were too many items per page, which could potentially have affected their response quality. Nonetheless, the majority of respondents reported that the language used in the survey was straightforward and comprehensible.

Table 3.5 The Technical Aspects of the Speaking Mindset Inventory

| Technical aspects | N | |
|---|---|---|
| | Yes | No |
| The instructions of the survey were clear. | 33 | |
| The survey was easy to navigate. | 33 | |
| Number of the items per one page is appropriate. | 17 | 16 |
| The language use in the survey is simple and easy to understand. | 26 | 7 |

Additionally, there was an open-ended question asking respondents to indicate any difficulties they had in understanding the survey items. Respondents were given the option to either provide their own answer or choose from a list as follows.

a) Use too much technical terminology

b) The wording is ambiguous.

c) The statement is too long.

d) Th statement is what I have never considered before.

Table 3.6 The Difficulties in Understanding the Survey Items

| Difficulties | N |
|---|---|
| a) Use too much technical terminology | 2 |
| b) The wording is ambiguous. | 10 |
| c) The statement is too long. | 7 |
| d) Th statement is what I have never considered before. | 8 |

The respondents indicated that the survey items were difficult to comprehend due to the ambiguity of the wording, the length of the statements, and the use of technical terminology. Furthermore, they stated that many of these items were previously unconsidered. Therefore, in revising the items, emphasis should be

placed on simplifying the language, avoiding technical terminology, and shortening the statements. Additionally, a brief introduction to the concept of foreign language speaking mindset may be necessary to ensure participants are familiar with the topic.

The interpretation of the survey was derived from the previous studies that employ the six-rating scale survey in their studies (Daskalovska et al., 2023; Vate-U-Lan & Masouras, 2018). The table for the interpretation of the foreign language speaking mindset inventory was presented below.

Table 3.7 Interpretation of 6-Point Likert Scale

| Scale | Weighted-mean interval | Interpretation |
|---|---|---|
| 6 | 5.17-6.00 | Strong growth |
| 5 | 4.33-5.16 | Moderate growth |
| 4 | 3.49-4.32 | Weak growth |
| 3 | 2.67-3.50 | Weak fixed |
| 2 | 1.83-2.66 | Moderate fixed |
| 1 | 1.00-1.82 | Strong fixed |

**b) Stage 2 Language Mindset Intervention**

**3.4.3 Language Mindset Toolkit**

The language mindset toolkit consisted of six videos that focus on language mindset and the motivational factors that may be impacted by mindset. The researcher's utilization of videos as instructional materials in language mindset sessions can be attributed to several reasons. Firstly, videos serve as materials that enhance students' understanding of new concepts by facilitating their cognitive processing. Simultaneously, videos play a pivotal role in increasing students' engagement with the process of learning new concepts (Marshall, 2002; Cruse, 2006; Mecida et al., 2023). Additionally, these videos aid students in improving their memory retention of the subject matter they are studying, ultimately leading to enhancements in their overall performance (Kabooha & Elyas, 2018; Chien, Huang, & Huang, 2020). The decision to employ videos as instructional materials was reinforced by the findings of the pilot study, which indicated that the concepts of language and foreign language speaking mindsets were novel to Thai undergraduate students. Prior research had already suggested that videos are well-suited materials for assisting in the comprehension of mindsets and are effective in promoting students' cognitive processing to facilitate their incorporation of these concepts into their language learning.

All videos were developed based on the Language Mindset Meaning-making System put forth by Lou and Noels (2019) (see Figure 2.2 in Chapter 2). Each video session is dedicated to one of the following six main topics.

**Table 3.8 Video Sessions in Language Mindset Toolkit**

| Session | Topic |
|---------|-------|
| 1 | Mindset, Brain Power, and Language Learning (EP1: The Formula "Mindset and Brainpower") |
| 2 | Language Mindset, Effort, and Attribution (EP2: Mind Matters) |
| 3 | Language Mindset and Achievement Goals (EP3: Unveiling the Secret) |
| 4 | Language Mindset and Interpretation of Failures and Mistakes (EP4: Embracing the Bumps) |
| 5 | Language Mindset, Self-regulation, and Emotions (EP5: Connecting the Dots) |
| 6 | Language Mindset and Speaking Skills (EP6: Unlock Your Potential) |

The length of each video does not exceed six minutes. Segmenting the content into six videos could facilitate cognitive load management for students when engaging with the video lessons, allowing them to better concentrate on the topic and engage more effectively with the content (Brame, 2016). Moreover, research by Guo, Kim, and Rubin (2014) indicated that short videos (0-3 minutes) had the highest engagement rates, with a median engagement time of six minutes for video lessons.

Prior to implementation in the present study, the videos underwent a validation process to ensure their content and design validity. Two experts in educational psychology assessed the videos for their relevance, accuracy, and alignment with the study objectives. The validators' assessments of each statement were analyzed using the content validity index (CVI). The results indicated that the instrument was suitable for the study, with a CVI value of 1. Furthermore, four undergraduate students participated in evaluating the quality and accessibility of the videos, ensuring that they met the requisite standards for effective utilization. The results indicated that the students demonstrated 95% agreement regarding the content's potential to facilitate delivery and enhance understanding of the topics. Concerning relevance, the students exhibited 86.25% agreement that the toolkit was pertinent in aiding their comprehension of language and foreign language speaking mindset, enabled the transfer and generalization of learned content to their contexts, and was appropriate for the topic. The students demonstrated 90% agreement that the language employed in the video facilitated comprehension of the topic concerning language and foreign language speaking mindset and provided sufficient examples of language mindset and speaking mindset for the purpose of message delivery. This validation procedure aims to enhance the credibility and appropriateness of the videos as a research instrument in the study.

### 3.4.4 Guided Journals

The students received the guided journal in a paper format. The journals contained a prompt (Thai language) that encourages students to articulate their thoughts on their foreign language speaking mindset and how they can leverage their mindset to enhance their learning of foreign language speaking. The prompts for the guided journal during each mindset session encompassed inquiries related to the main ideas presented in the video, students' experiences relevant to the video content, reflections on past behaviors, and prospects for personal improvement.

### 3.4.5 Speaking Test

The evaluation of students' speaking performance involved both pre- and post-intervention assessments. These assessments aligned with the group conversation test used by the School of Foreign Languages at Suranaree University of Technology. The tests consisted of group conversations, with four participants in each group, and have a duration of seven minutes per group. The researcher employed the rubric scoring system provided by the School of Foreign Languages to assess students' speaking performance. The rubric scoring evaluates two key aspects of speaking performance: fluency and accuracy. The scoring system ranges from zero for students who make no speaking effort, characterized as "no performance at all," to 20 for students who demonstrate effective control of grammatical forms, maintain simple exchanges well, and use an appropriate range of vocabulary, described as "quite fluent and accurate."

**Table 3.9 Rubric Scoring for Speaking Test**

| Range | Description |
|-------|-------------|
| 16–20 | **Quite fluent and accurate** |
|       | - Maintains simple exchanges quite well |
|       | - Controls grammatical forms quite effectively |
|       | - Uses an acceptable range of appropriate vocabulary |
| 11–15 | **Reasonably fluent and accurate** |
|       | - Can maintain simple exchanges |
|       | - Controls grammatical forms to some extent |
|       | - Uses a somewhat limited range of appropriate vocabulary |
| 6–10  | **Somewhat fluent and accurate** |
|       | - Cannot exchange ideas actively |
|       | - Displays poor grammatical forms that do not hinder effective communication much |
|       | - Uses a quite limited range of appropriate vocabulary |
| 1–5   | **Barely fluent and inaccurate** |
|       | - Cannot exchange ideas well but nods his/her head in agreement evasively |
|       | - Displays poor grammatical forms that hinder effective communication |
|       | - Uses a very limited range of appropriate vocabulary/uses a lot of inappropriate vocabulary |
| 0     | **With no attempt** |
|       | - No performance at all |

To ensure the reliability of the scoring for both the pre- and post-intervention tests, two raters engaged in the evaluation process. The data from the speaking test were analyzed together with the data from the Language and Foreign Language Speaking Mindset Inventory utilizing correlations and triangulated with the survey data to assess both the impact of the mindset intervention and the dynamic nature of the foreign language speaking mindset among undergraduate students.

**c) Stage 3 Foreign Language Speaking Mindset Survey, Q-Methodology, and Semi-Structured Interview**

**3.4.6 Foreign Language Speaking Mindset Inventory (FLSMI)**

The Foreign Language Speaking Mindset Inventory (FLSMI) was utilized in this stage. In the initial stage of data collection, the survey was administered to participants. The Foreign Language Speaking Mindset Inventory comprises 21 items designed to gauge specific aspects of the foreign language speaking mindset. The participants utilized a 6-point rating scale, indicating their level of agreement on each item, ranging from 1 (Strongly Disagree) to 6 (Strongly Agree). All questionnaire items were translated into Thai. The back-translation method was employed as a documentation tool (Son, 2018). This translation process enhances the validity and reliability of the instruments when administered to Thai-speaking participants in this study.

**3.4.7 Q-set**

The term "Q-set" refers to the collection of statements that individuals use to express their points of view regarding a specific topic (Bartlett & DeWeese, 2015). As the study seeks to encompass the various facets of undergraduate students' foreign language speaking mindset, Q-methodology was employed. This choice is based on the utilization of Q-methodology to investigate the diverse patterns of thought among the participants (Akhtar-Danesh, 2018). By employing Q-methodology, the researcher will gain insight into the process by which participants rate each statement in real-time and engage in discussions about their perspectives while sorting, which distinguishes this approach from using a traditional survey (Zabala, Sandbrook, & Mukherjee, 2018). In this study, the 42-item of the Foreign Language Speaking Mindset Inventory (FLSMI) survey were adapted and employed as a Q-set for Q-methodology. As a foundational step in the development of the FLSMI, the researcher defined the constructs to be investigated in the present study. Subsequently, items were written to represent foreign language speaking mindset. To ensure the quality and validity of the FLSMI, the initial set of statements underwent a pilot phase with one undergraduate student and was subsequently revised based on feedback from subject matter experts and findings

from the pilot study. This iterative process aimed to refine the clarity and appropriateness of the items, enhancing the overall efficacy of the inventory. The FLSMI items, which capture various aspects of learners' foreign language speaking mindset, were repurposed to serve as the basis for the Q-set in the Q-methodology phase of the research. This approach ensures consistency in the constructs and statements explored throughout the study, enabling a seamless transition from the FLSMI survey to the Q-methodology procedure. By employing the same items as the foundation for both methodologies, the study seeks to comprehensively examine and triangulate learners' perspectives on foreign language speaking mindset, fostering a more robust and coherent understanding of this critical aspect of language learning.

### 3.4.8 Semi-structured Interview

The semi-structured interview served the purpose of acquiring insightful perspectives on the language mindset and foreign language speaking mindset among Thai undergraduate students. This method enabled the interviewer to predefine the topic while maintaining flexibility in the sequencing of questions (Cohen et al., 2007). These interview items aimed to examine the relationship between language mindset, foreign language speaking mindset, perceived language proficiency, and factors associated with foreign language speaking mindset. This exploration intends to yield a comprehensive understanding of the intricate and nuanced aspects of language mindset and foreign language speaking mindset among Thai undergraduate students. Additionally, the investigation into the dynamic nature of foreign language speaking mindset over time seeks to illuminate the evolving nature of mindset development during the academic journey. Each interview is expected to last approximately 15-30 minutes per group of students. During the interview, participants will be given the freedom to communicate in their preferred language. All interview questions are provided in Appendix E. The questions focused on participants' perceptions of language mindset and foreign language speaking mindset. Examples of the interview questions include: "Do you think someone can change their foreign language speaking ability?", "Please describe how you came to believe this," and "Have you always thought this way?"

The semi-structured interview questions were submitted to two experts in the field of applied linguistics to validate the content of the interview. The item objective congruence (IOC) score of all items were 0.50 and 1 which suggested that all items were suitable for the study. The comments regarding some items indicated minor revisions regarding the wording used in the interview and the preparation for the participants. The researchers revised the interview questions and conducted a pilot

study with one Thai graduate student and one Thai undergraduate student to ensure comprehension of the questions before implementing them in the study.

## 3.5 Data Collection

The data collection in the current study was organized into three stages, as outlined in the Design of the study section. Prior to conducting the research activities, the researcher submitted a proposal to the Institutional Review Board (IRB) for approval of the research and requested permission to collect data from the School of Foreign Languages, Suranaree University of Technology. Figure 3.3 below showed the data collection in this study.
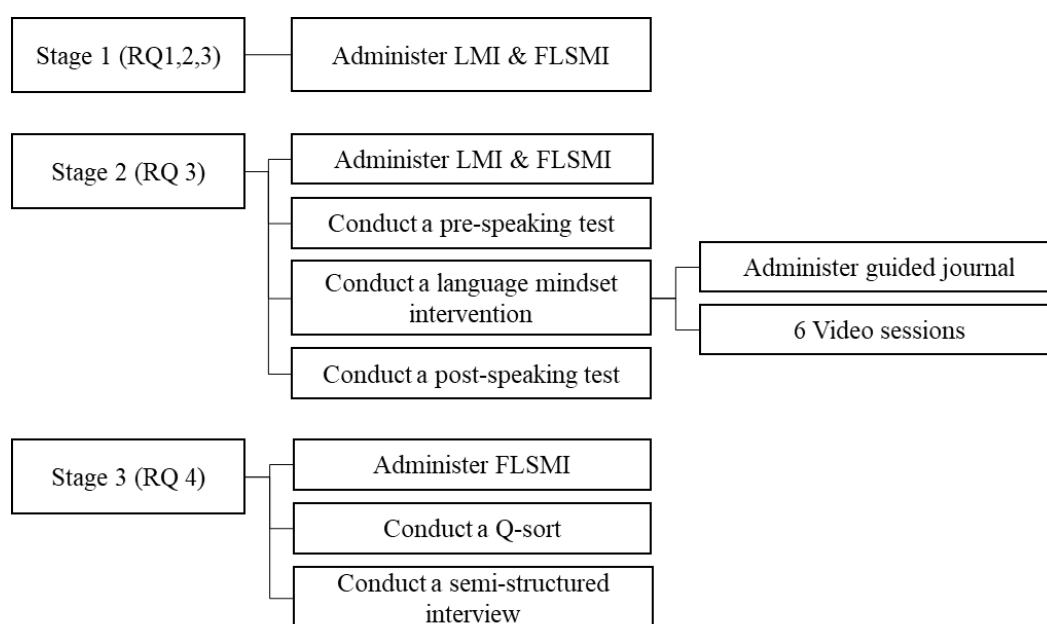


**Figure 3.3 Data Collection**

The above figure illustrated the data collection process across three stages of the study. In Stage 1, the mindset surveys were administered. Stage 2, involved a language mindset intervention. Finally, Stage 3 conducted the foreign language speaking mindset survey, Q-sort, and semi-structured interview. This figure provided a clear timeline and structure for how data were systematically gathered to address the research objectives.

### 3.5.1 Stage 1 Language Mindset Survey and Foreign Language Speaking Mindset Survey

The Language Mindset Inventory (LMI) and the Foreign Language Speaking Mindset Inventory (FLSMI) were administered to undergraduate students at Suranaree University of Technology both online and on-site. This stage took two weeks, and the

surveys took 15-20 minutes to complete. Prior to initiating the surveys, participants were required to complete the informed consent form, which is provided on the initial page of the survey. Participants received explicit information that all collected data will be treated with strict confidentiality and anonymity.

### 3.5.2 Stage 2 Language Mindset Intervention

The mindset intervention was implemented in the authentic classroom setting. At the beginning of the first session, students were asked to complete the Language Mindset Inventory (LMI) and Foreign Language Speaking Mindset Inventory (FLSMI). Following this, the pre-speaking test was performed. The students were randomly put into group of four. Then, the students got the topic for speaking and will have 7 minutes for preparation within their group. Then, the students performed the speaking test 7 minutes per group. In the following session, the mindset videos were provided to students in their English for Communication I course, with each video ranging in length from two to six minutes depending on the topic. The researcher participated fully as an instructor during the implementation of the mindset video instruction. Prior to watching each video, the students received a guided journal to take notes on the content. Following the video, the students engaged in a discussion related to the video content and how they can apply the knowledge of language mindset in their foreign language learning and speaking. The video instruction on mindset was conducted for approximately 10-15 minutes. After the class, students were assigned to complete a self-reflection in the guided journal and fill out the section evaluating their mindset, which was provided in guided journal. If the students attended the class late or if the students would like to watch the videos again, they were informed that they were able to access the link to watch the videos online, at their convenience.

The instructional videos on mindset consisted of six sessions, each focusing on a specific topic. After six sessions of the intervention, the post-speaking test was performed. The data collected from this stage were analyzed and triangulated with the data collected from surveys and interviews in Stages 1 and 3. Prior to the language mindset intervention, the research assistant informed the students about the study and the procedures they would follow throughout the intervention. Participants were made aware of their right to withdraw from the study at any point if they experienced discomfort, without any impact on their academic performance or scores. All data collected during the study would be treated with strict confidentiality and anonymity. In addition, informed consent was obtained from each participant before the intervention began.

### 3.5.3 Stage 3 Foreign Language Speaking Mindset Survey and Semi-structured Interview

In this stage, the researcher asked for volunteers from Stage 2 to participate in a follow-up interview regarding their mindset. The researcher administered the Foreign Language Speaking Mindset Inventory (FLSMI), which took approximately 15-20 minutes to complete. Subsequently, the Q-set was provided, and participants were required to reorder the 42 statements according to the degree of fidelity to their opinions, which took approximately 20 minutes. Following this, a semi-structured interview was conducted, which was audio recorded with the students. The interview took approximately 15-20 minutes. Prior to the Q-sort and semi-structured interview, the researcher obtained written consent from the students. Participants were informed that audio recordings would be made during both the follow-up interview after the Q-sort and the semi-structured interview. They were clearly informed of their right to withdraw from the interview at any time if they experienced discomfort, anxiety, or stress, without any negative effect on their academic performance.

## 3.6 Data Analysis

### 3.6.1 Research Question One: What are the language mindset and foreign language speaking mindset of Thai undergraduate students?

Statistical analysis was employed to analyze the data collected from the mindset surveys. Descriptive statistics, including frequency and mean, were utilized to summarize the collected data, which enabled the researcher to answer Research Question 1.

### 3.6.2 Research Question Two: What are the factors related to foreign language speaking mindset among Thai undergraduate students?

The study employed Exploratory Factor Analysis and Confirmatory Factor Analysis to examine the factors related to foreign language speaking mindset, and to answer Research Question 2.

### 3.6.3 Research Question Three: Is there a significant relationship between and among mindsets and speaking performance of Thai undergraduate students?

The correlation was utilized to determine the interrelationships among language mindset, foreign language speaking mindset, and perceived English language proficiency. The thematic analysis was employed to analyze guided journal data. These analyses aimed to address Research Question 3.

**3.6.4 Research Question Four: Does the foreign language speaking mindset of Thai undergraduate students undergo any changes over time, and if so, what is the nature of such changes?**

The Paired Sample T-Test was employed to examine changes of foreign language speaking mindset. The qualitative data obtained from the guided journals, Q-sort, and semi-structured interviews were analyzed using a thematic analysis approach in a deductive manner and were used to triangulate quantitative data from the surveys. This answered Research Question 4.

**Table 3.10 Summary of the Data Analysis**

| RQs | Methods | Instruments | Analysis |
| --- | --- | --- | --- |
| 1. What are the language mindset and foreign language speaking mindset of Thai undergraduate students? | Survey | LMI & FLSMI | Descriptive statistics |
| 2. What are the factors related to foreign language speaking mindset among Thai undergraduate students? | Survey | FLSMI | EFA |
| 3. What are the relationships among language mindset, foreign language speaking mindset, and speaking performance of Thai undergraduate students? | Survey, Mindset intervention, Speaking test | FLSMI, Language mindset toolkit, Guided journals, Pre- and post-speaking test | Correlation |
| 4. Does foreign language speaking mindset among Thai undergraduate students change over time, and if so, what is the nature of this change? | Survey, Q-methodology, Semi-structured interview | FLSMI, Q-set, Semi-structured interview | Paired Sample T-Test, Card-sorting analysis, Thematic analysis |

## 3.7 Implications from the Pilot Study

The pilot study suggested a framework for categorizing the undergraduate students' foreign language speaking mindset based on Lou & Noels' language mindset meaning-making system (2019).

## Table 3.11 The Undergraduate Students' Foreign Language Speaking Mindset

| Group/Aspects | Strong Fixed mindset | Weak fixed and Weak growth mindset | Strong Growth mindset |
|---|---|---|---|
| Foreign language speaking mindset | Students believe that their foreign language speaking is fixed. | Students believe that their foreign language speaking is malleable and recognize the influence of natural ability. | Students strongly believe that their foreign language speaking is malleable. |
| Effort | Students believe that natural ability is essential for improvement in their foreign language speaking. | The students hold the belief that effort is essential for improvement in their foreign language speaking ability. However, they also recognize the influence of natural ability on their proficiency in this area. | Students strongly believe that effort is essential for improvement in their foreign language speaking. |
| Attribution | Students attribute success in foreign language speaking primarily to natural ability. | Students attribute their success in foreign language speaking primarily to effort, they also acknowledge the role that natural ability may play in their foreign language speaking. | Students attribute success in foreign language speaking primarily to effort. |
| Achievement Goals | Students firmly set performance goals in learning foreign language speaking. | Students generally set learning goals for their learning of foreign language speaking. However, they may also set performance-avoidance goals. | Students firmly set learning goals in learning foreign language speaking. |
| Failures/ Mistakes | Students firmly interpret failures and mistakes as evidence of insufficient natural ability in foreign language speaking. | Students tend to interpret failures and mistakes in their foreign language speaking ability as evidence of insufficient effort. They also acknowledge the potential influence of their natural abilities. | Students firmly interpret failures and mistakes as evidence of insufficient effort in foreign language speaking. |
| Self-regulatory tendencies | The students display a minimal inclination to self-regulate their learning of foreign language speaking, as demonstrated by a very low tendency to establish goals, monitor their progress, and adapt their strategies accordingly. Additionally, they maintain a negative attitude towards negative feedback and setbacks encountered during the process of learning foreign language speaking. | Students exhibit an inclination to regulate their own learning of foreign language speaking by setting goals, monitoring their progress, and making necessary adjustments. Additionally, they maintain a positive attitude towards negative feedback and setbacks encountered during the process of learning foreign language speaking. | Students exhibit a strong inclination to regulate their own learning of foreign language speaking by setting goals, monitoring their progress, and making necessary adjustments. Additionally, they maintain a positive attitude towards negative feedback and setbacks encountered during the process of learning foreign language speaking. |
| Competence-based emotional tendency | Students expose to more negative emotions in foreign language speaking. | Students expose to more positive emotions in foreign language speaking. | Students expose to more positive emotions in foreign language speaking. |

## 3.8 Summary of the Chapter

This chapter explains the methodology that will be implemented in the present study. The research design encompasses a mixed-method approach, combining both quantitative and qualitative methods for data collection and analysis, which are illustrated in combination with the research instruments. Additionally, the outcomes and corresponding analyses from the pilot study are presented within the scope of the research design.