

The Effect of Growth Mindset Training on First-Year Thai Undergraduate Engineering Students

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Abstract—This paper explored the effectiveness of growth mindset training on first-year Thai undergraduates majoring in engineering in English as a Foreign Language (EFL) classrooms, and their perspectives on the activities or teaching approaches that help cultivate a growth mindset. Forty-one engineering freshman students at a private university in Thailand participated voluntarily and completed the growth mindset training. A mixed methodology was used in this study. Quantitative data were analyzed using a paired-samples *t*-test to compare the mindset scores for the pre- and post-training. The results showed a significant difference between the mindset scores in pre-training ($M=62.66$, $SD=4.67$) and those in post-training ($M=65.29$, $SD=6.15$, $t_{40}=-3.37$, $p=0.002$). The findings suggested that the mindset activities or teaching approaches in the training could be used in teaching English to help students enhance their growth mindset.

Keywords—Mindset, teaching English, English as a Foreign Language

I. INTRODUCTION

SOME students believe they understand math well, but not English because of their judgments based on past experiences. As an English teacher, I often have heard my students criticizing themselves by saying such things as, “I am not good at English,” or “I am stupid.” These thoughts tend to occur in a person who has a “fixed mindset.” A fixed mindset occurs in an individual who believes that s/he was born with certain abilities or skills that cannot be changed Dweck (2006). For example, a student believes that s/he was or was not born with language ability, and these positive or negative beliefs can influence English skills. Studies have found that a fixed mindset has negative effects on students’ academic achievement (Blackwell, Trzesniewski, & Dweck, 2007), motivation to learn (Haimovitz, Wormington, & Corpus, 2011), and learning success (Mangels et al., 2006). Students who believe they were born with language ability and that they are good at English tend to avoid attempting challenging English tasks because of their fear of failure. If they fail in the task, it may indicate that they are not smart. They also may not want to learn or practice their English skills because they believe that they already are smart. On the other hand, some students may believe that they are not smart, and thus, they do not want to continue to practice and learn the skills that they believe they cannot obtain.

A fixed mindset is opposite to a growth mindset. Students who have a growth mindset believe that their skills or abilities can change and be developed over time. These students do

not believe their skills or abilities are fixed and will remain the same for the rest of their lives. According to Dweck (2006), students who have a growth mindset try to find ways to improve themselves. Blackwell et al. (2007) found that students who had a growth mindset tended to have more motivation to learn than did those with a fixed mindset.

As a result, educators have tried to identify ways to cultivate a growth mindset in students (Blackwell et al., 2007; Hadipoor, Jomehri, & Ahadi, 2015; Paunesku et al., 2015). A teaching approach that helps cultivate a growth mindset is often used to teach mathematics (Boaler & Dweck, 2015; Boaler, Munson, & Williams, 2017; Rattan, Good, & Dweck, 2012). However, there appears to be a lack of research in this area in the field of teaching English. Thus, the purpose of this paper was to determine the effect of growth mindset training and explore students’ perspectives about the activities or teaching approaches that help cultivate their growth mindset in EFL classrooms.

The study addressed two research questions, as follows:

- i. Can growth mindset training help undergraduate students cultivate a higher level mindset in learning English?
- ii. What is the growth mindset activity or teaching approach that students found the most helpful and why?

II. LITERATURE REVIEW

Dweck (2006) proposed the concept of growth and fixed mindsets. She and her colleague conducted an experiment on fifth grade students to study the effects of praising students’ efforts versus their abilities or intelligence. According to Mueller and Dweck (1998), the studies found that students who were praised for intelligence by hearing “You must be smart at these problems” after the students finished the task cared more about performance rather than learning goals by comparison to those students who were praised for their efforts (“You must have worked hard at these problems”). Moreover, students who were praised for their abilities or intelligence showed less persistence and enjoyment in doing the tasks, and their task performance also was worse than was that of students who were praised for their efforts. Dweck (2006) explained that praising intelligence can create a fixed mindset in students. The students believe that their intelligence is innate. They wish to be seen as intelligent, and as a result, do not want to attempt new and challenging tasks because they are afraid of failure and being viewed as unintelligent.

Recently, education scholars have studied the concept of mindset (Blackwell et al., 2007; Esparza, Shumow, & Schmidt, 2014; Hadipoor et al., 2015; Paunesku et al., 2015; Yeager & Dweck, 2012). However, there has been very little research on using growth mindset as an intervention in the classroom. Only one study (Paunesku et al., 2015) used a growth mindset intervention through online modules in one school. This study revealed that a growth mindset intervention increased students' grade point averages.

Mindset has been implemented as an innovative approach in teaching mathematics (Boaler & Dweck, 2015; Boaler et al., 2017; Rattan, Good, & Dweck, 2012). However, there is little research on the subject in the field of teaching English. Given this gap in the literature, this study was designed to examine the effect of growth mindset training on EFL students in writing classrooms.

The hypothesis is as follows:

Students' mindset scores will increase significantly after growth mindset training.

III. METHODOLOGY

A total of 73 undergraduate students, the majority of whom was first-year engineering students, agreed voluntarily to sign the consent form. Data from students who were not freshman or engineering majors were excluded from the analysis to maintain a homogenous sample. At the end, 41 first-year undergraduate engineering students (male=26, female=15) who ranged in age from 18 to 23 years completed the entire training. They were enrolled in two sections of the same English Reading and Writing class in the first semester of their academic year 2016, and their levels of English proficiency ranged from beginner to pre-intermediate.

The study used a mixed methods design, and data from pre- and post-training questionnaires. The pre-training questionnaire contained the modified version of the mindset scale (Diehl, 2017: see Appendix) which was given to students to measure their mindset level before the training began. This is a Likert scale that ranges from 1 (Strongly agree) to 4 (Strongly disagree) for the fixed mindset questions and from 4 (Strongly agree) to 1 (Strongly disagree) for the growth mindset questions. The scale was validated by three English instructors with a research background, and was administered to 62 undergraduate students to determine reliability. The reliability test yielded a Cronbach's alpha of 0.81, and Cronbach's alpha based on standardized items of 0.81. After the students completed the pre-training questionnaire, growth mindset activities adapted from mindset kits (Mindsetkit, 2017) and Dweck's books (Dweck, 2006; Dweck, 2012) were introduced in EFL writing classrooms to help students enhance their growth mindset. There were 6 activities or teaching approaches: 1) Watching the VDO (Neuroplasticity, 2017; Growing your mind, 2017) about the brain to learn that the brain can develop; 2) Listening to the teacher's experience learning English to show the students that English language skills develop over time through effort; 3) Discussing the students' mistakes so they understand that it is okay to make mistakes and they can learn from them; 4) Providing feedback by meeting students individually and praising the process or the students' efforts and not their intelligence; 5) Making a portfolio so students can see their progress by using the word "yes" or "not yet" to

answer the question "Did you improve your writing skill?", and 6) Grading the assignment without showing the scores on the students' papers so students focus on learning, not the grades. After the training was completed, the students were given the post-training questionnaire, which had the same mindset scale with the addition of open-ended questions used to measure their mindset level and determine the students' perspectives about mindset activities or teaching approaches. The concepts of fixed and growth mindsets were introduced to the students at the end of the training after they had completed the post-training questionnaire.

The mindset scores were analyzed with a paired-samples *t*-test using SPSS to determine whether there was a significant difference between the pre- and post-training mean mindset scores to answer research question number 1. The answers to the open-ended questions were analyzed using thematic content analysis to answer research question number 2.

IV. RESULTS AND DISCUSSION

Research Question 1: Can growth mindset training help undergraduate students cultivate a higher level mindset in learning English?

A paired-samples *t*-test was conducted to evaluate whether growth mindset activities helped increase EFL students' mindset scores, and the results indicated that there was a significant difference between the mean of pre- and post-training mindset scores. The post-training mean scores ($M=65.29$, $SD=6.15$) were significantly higher than were the pre-training scores ($M=62.66$, $SD=4.67$, $t_{40}=-3.37$, $p=0.002$).

The findings above revealed that mindset activities could cultivate students' growth mindset. The pre-training mean mindset scores were in the range of 51-65 points, indicating that students had a growth mindset that included some fixed ideas. After the training, the mean mindset scores increased to 65 points, which is the highest score within the range of the strong growth mindset scores that include some fixed ideas.

Research Question 2: What is the growth mindset activity(ies) or teaching approach(es) that students found the most helpful and why?

To answer research question #2, the data obtained from the open-ended questions were evaluated with thematic content analysis. The results showed that fifteen students (36.59%) found the teacher's feedback the most helpful. Fourteen students (34.15%) stated that discussing their mistakes was the most helpful method, and three students (7.32%) believed that creating a portfolio was the most helpful activity. There were nine missing data or invalid data points. The qualitative findings are shown in Table 1.

According to Table 1, the students found three mindset activities or teaching approaches most helpful. The students gave a similar explanation: helping them "know the mistakes." However, there were two more explanations of teacher's feedback. They thought that teacher's feedback was the most helpful because they received suggestions about ways in which to improve their writing. Further, some students explained that they felt encouraged by the teacher's feedback.

TABLE I
STUDENTS' PERSPECTIVES ABOUT THE MOST HELPFUL MINDSET ACTIVITIES
OR TEACHING APPROACHES

Mindset activities or teaching approaches	Frequency	Percentage (%)	Reasons
Teacher's feedback	15	36.59%	1. Knowing the mistake: to make them correct 2. Receiving teacher's suggestions 3. Receiving encouragement
Discussion of the mistakes	14	34.15%	1. Knowing the mistakes to make them correct
Making a portfolio	3	7.32%	1. Knowing or learning from mistakes

Here are some examples from the open-ended question.

1. Teacher's feedback:

"Having an individual meeting made me understand more than sitting in classroom with friends because I can ask teacher and the teacher can give the direct suggestions because some point (of writing mistakes) that was wrong was not the same as (mistakes of) other friends" (Male # 9).
"Because I know my mistakes...A teacher suggested why it's incorrect and taught me how to write correctly. When I could do it, a teacher gave a compliment. It made (me) feel glad that I can write more" (Female #19).

2. Discussion about the mistakes:

"Because (I) will know the mistake (and) make it correct and (I) am encouraged. This is important. (It) made me learn English better" (Female #18).
"Discussing about mistakes made me learn and improve to make it right" (Male #27).

3. Portfolio:

"Making a portfolio helped in studying and learning English more by learning from my mistakes" (Male #10).

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"Because practice writing by myself even though I wrote incorrectly when I received my assignment back, it made me know my mistakes and made me have better improvement in those areas more" (Female #40).

The similar reason that students gave—knowing the mistakes—indicates that the students developed a strong growth mindset. The students saw mistakes as something that could help them learn English better. Moreover, another reason—receiving teacher's suggestions—also indicated that the students were open to feedback. According to Dweck (2006), students who have a growth mindset continue doing things even if they meet obstacles. Moreover, they profit from feedback because they do not see feedback as an insult or an attack on their ability. Instead, they continue learning by looking at their mistakes and using the feedback.

V. CONCLUSIONS AND RECOMMENDATIONS

The results from a paired-samples *t*-test revealed overall that mindset activities or teaching approaches enhanced EFL students' growth mindset. Moreover, the similar explanations that the students gave that the most helpful mindset activities or teaching approaches were those that helped them "know the mistakes" suggested that the students achieved a growth mindset. However, because of the small sample size, the results may not be generalized to a large population. Future research should replicate this study with a larger group or another group of students who are not engineering students to determine whether the results differ.

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APPENDIX

	Strongly agree	agree	disagree	Strongly disagree
1. Your intelligence is something you are born with that you can't change very much.				
2. No matter who you are, you can always change your intelligence level.				
3. You can always change how intelligent you are.				
4. You are a certain kind of person, and there is not much that can be done to really change your language ability.				
5. You can always change your language ability.				
6. Language can be learned by anyone.				
7. Only a few people will be truly good at language you have to be "born with it."				

8. Language is much easier to learn if you are female.				
9. The harder you work at something, the better you will be at it.				
10. No matter what kind of person you are, you can always change your language ability.				
11. Trying new things is stressful for me and I avoid it.				
12. Some people are good at English, and some are not – it's not often that people change their language ability.				
13. I appreciate when teachers and friends give me feedback about my English performance.				
14. I often get angry when I get feedback about my English performance.				
15. All human beings without a brain injury or birth defect are capable of the same amount of learning English.				
16. You can learn new things, but you can't really change how intelligent you are.				
17. You can do things differently, but you can't really change how intelligent you are.				
18. Human beings are basically good, but sometimes make terrible decisions.				
19. An important reason why I do my school work is that I like to learn new things.				
20. Truly smart people do not need to try hard.				