

# Master's Study Duration: The Effects of Active Learning Based on the Belief-Action-Outcome Model\*

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Influenced by Confucianism, the social role is postponed from school to work in Taiwan, most young adults enter the job market after completing a higher education degree. However, in recent years, delayed graduation by postgraduate students has become a problem. To understand this phenomenon, this study recruited a mix of participants who had already graduated and participants who were about to graduate (individuals who had completed their courses and thesis). The aim of the study was to explore (1) how individuals' academic self-efficacy affects their active learning strategies and academic self-confidence and (2) how this is reflected in the duration of their studies. A total of 245 valid questionnaires were collected, comprising the responses of 91 men and 154 women. Among the participants, 34.3% graduated on time, whereas 51% did not graduate on time because of incomplete theses. A confirmatory factor analysis approach was adopted in this study. The results demonstrated that academic self-efficacy was positively related to active learning strategies (higher-order, integrative, and reflective strategies) and active learning strategies were positively related to academic self-confidence, whereas academic self-confidence was negatively related to an extended duration for completing a master's degree.

*Keywords:* academic self-efficacy, academic self-confidence, active learning strategies, belief-action-outcome model, study duration

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The relatively low graduation rate of higher education in traditional practice has received widespread attention (Roksa, 2010). For example, the average completion time for a master's degree in Uganda is 3 years and 8 months, significantly higher than the required 2-year period (Wamala & Oonyu, 2012). In addition, most Belgian research students receive a master's degree after 5 years of study (Dupont et al., 2013). Many students hesitate to enter the job market as early as their parents did (Hirschi, 2018). As a result, universities around the world are working to shorten the study duration to prevent high dropout rates (Geven et al., 2018). However, according to the from-school-to-work model, postponing graduation means deferring taking up one's social role (Danziger & Ratner, 2010). In Western societies, adulthood tends to be defined by a social role that involves a balance among independence, interdependence, responsibility, and productivity (Smith et al., 2016).

In contrast, under Confucianism, if people are educated, they will eventually have a better social role, so continuing to study without stopping for any reason is embedded in most Taiwanese people's thinking. So as not to have to get a job, tertiary education has become very common in Taiwan. Many young people try different ways to continue their studies and thus postpone taking up their social role of making money to help support their families (Smith et al., 2016).

Although in recent years the status of graduation postponement of master's study has not been announced by the Statistical Department of Ministry of Education, Taiwan, The Chief Executive Office of the Executive Yuan in Taiwan pointed out that in 2011 there were 619 doctoral students and 4,482 master's students who had to extend their studies. In 2009, the numbers were 495 and 2,607 for doctoral and master's degree students, respectively. When comparing these two years, the delayed graduation rate increased by 25.1% for doctoral students and 71.9% for master's students (Directorate-General of Budget, Accounting and Statistics, Executive Yuan, 2012). However, what causes them to delay is not clear and needs to be studied. According to the dominance of Confucianism, stopping their study to earn money to help support their families is not the main reason why those Taiwanese students delay their graduation (Agu, 2014). Some research has indicated that psychological characteristics are critical to academic learning and success (Galla et al., 2014); thus, this study explored some relevant factors from the perspectives of educational psychology.

The concept of active learning was highlighted by Bonwell and Eison (1991) who defined it as learning activities that engage students and encourage them to think deeply about what they are doing (Hyun et al., 2017). Active learning is a key aspect of educational psychology, given that learners perform cognitive processes when they face a learning task, and they also refer to motivational matters that force the student to control their own learning process (Martin-Lobo et al., 2018). Active learning promotes students' higher order learning with critical thinking, and involves them in integrating knowledge; with these skills, they are more willing to work through challenging material (Adkins, 2018). However, different learning strategies tend to emerge in environments which change significantly over the period of individual lifetimes (Bullinaria, 2018). In this sense, how active learning affects those individuals' postponement of their master's study is the focus of this study.

This study draws on the belief-action-outcome (BAO) theory, which can effectively explain individuals' behaviors and final outcomes (Melville, 2010), and how people's beliefs influence their subsequent actions, which will in turn have a significant impact on their behavioral outcomes. For the purpose of this study, BAO was adapted to explore the correlates between academic self-efficacy, active learning strategies, and academic self-confidence to understand how those antecedents relate to the delay of graduation. It was expected that the results of this study could help readers explore the role of academic self-efficacy and understand the significance of active learning strategies adapted by those students who defer completion of their graduate studies.

## Literature Review

### Academic Self-efficacy

In educational psychology, academic self-efficacy has been identified as an important factor influencing the academic performance of college students. Academic self-efficacy was defined by Odaci (2011) as the belief students have in their ability to handle academic tasks. Without it, students may experience procrastination or inability to learn (Jung et al., 2017). Related research shows that academic self-efficacy has a predictive effect on successful learning in universities (Gore, 2006). Students with high self-efficacy can enhance their achievements in the field (Schöber et al., 2018). In addition, it is well known that low levels of academic self-efficacy also prevent students from conducting research and learning with a strong desire (Love et al., 2007). Based on this, academic self-efficacy is seen as an important regulator of student learning behavior to complete their studies (Meluso et al., 2012). Thus, how academic self-efficacy affects those post-graduate students in working on their master's degree was explored in this study.

### Active Learning Strategies

There are many factors influencing learning, one of which is active learning, the learning strategy considered to explain one of the successful learning factors (Poondej & Lerdpornkulrat, 2016). These learning factors can be a great help to graduate students since they are required to write a dissertation. Dissertations are the most enduring, autonomous, and creative research task students must undertake, and require the adoption of high-level and in-depth strategies (Dupont et al., 2013). The active learning strategy is the approach whereby students make efforts to have some practical experience in their study (Warburton, 2003). Active learning can be taken to mean how students practice deep inquiry into the meaning of learning, focusing on integration and reflection methods (Vos et al., 2011). Previous research has pointed out that the completion of a master's degree and active learning approaches are highly related (Drennan, 2010). Thus, this study explored the learners' strategical actions for active learning when they conducted academic study. Moreover, how active learning strategies (i.e., critical analysis, reflection, and integration) can affect master's students' learning in relation to how long it takes them to obtain a degree was the topic of interest of this study.

### Academic Self-confidence

A psychological factor related to learning effectiveness is self-confidence, and a major feature of self-confidence is clear personal beliefs (White, 2009). Self-confidence is a subjective post-experience that stems from the individual's deterministic judgment of self-expression and which prompts the individual to immediately respond to current performance perceptions (Jiang & Kleitman, 2015). For example, self-confidence is considered to predict the future performance of individuals (Hong et al., 2017). Academic self-confidence is defined as an individual's self-confidence perception of his/her own academic ability (Laird, 2005) (e.g., confidence in solving academic writing or research questions). In the field of education, academic self-confidence is used to predict academic success or failure (Nokelainen et al., 2007). Because academic self-confidence is an important facet in the context of learner-centered learning (Maclellan, 2014), this may imply the effect of academic self-confidence on the duration of graduate study, and thus needs to be explored. Therefore, this study explored learners' perceptions of self-confidence in their academic abilities when conducting academic research.

## Study Duration

The study duration is the time it takes for learners to obtain their degree. Most countries in the world have a time limit for degree studies (Almgren, 2014). In the context of the growing number of graduate students, universities around the world are working to shorten the duration of their studies at institutes (Geven et al., 2018). Ho et al. (2020) considered study duration as a form of academic performance, and study duration can be considered as the overdue performance of the participants in the study. Looking at the example of Finland, the average time to complete a master's degree is between 6 and 6.5 years, instead of the expected 5 years (Haarala-Muhonen et al., 2017), whereas most students in Belgium need 5 years to earn a master's degree (Dupont et al., 2013). Given this situation, understanding students' attitudes toward postponing their master's degree graduation is an important indicator of whether a student will experience a delay in graduation. In addition, the duration of obtaining a master's degree refers to the total time within which students are required to complete their master's study, and is the topic explored in this paper. Therefore, this study examined study duration, meaning the time that students spend to complete their master's degrees.

## Research Questions

The control-value theory predicts that students will invest more effort if they perceive activities to be valuable and if they anticipate success (Cooper et al., 2017). Academic self-efficacy is a kind of expectation belief that is closely related to the construction of successful expectations (Bergey et al., 2018). At the same time, research has shown that self-efficacy has a major impact on the use of in-depth processing strategies (Berger & Karabenick, 2011). In the field of educational psychology, there is a strong relationship between self-confidence and academic achievement (Stankov et al., 2012). However, given the dissimilarities in the bases of self-confidence and self-efficacy, it is essential to explore both constructs to fully understand the relationship between these structures (Munroe-Chandler et al., 2008). In line with this, the term "confidence" is used, and the difference between the two constructs lies in the point in time, with self-efficacy being the construct before (hypothetical) cognitive behavior, and self-confidence after cognitive behavior (Morony et al., 2013). Therefore, since self-confidence and self-efficacy are different concepts and are measured in different ways, including both is an important component of delivering a more comprehensive examination of different levels of self-confidence-related constructs (Munroe-Chandler et al., 2008) and can provide a more complete understanding of the impact of academic self-confidence on completion of graduate studies. This study included both as important components to better understanding the impact of academic self-confidence on completion of graduate school.

However, the interaction between those factors has not been studied in relation to the postponement of the graduation of master's students; thus, the purpose of this study was to answer the following research questions: (1) Is academic self-efficacy related to the three active learning strategies? (2) Are those three active learning strategies related to academic self-confidence? and (3) Is academic self-confidence related to the length of delay of graduation?

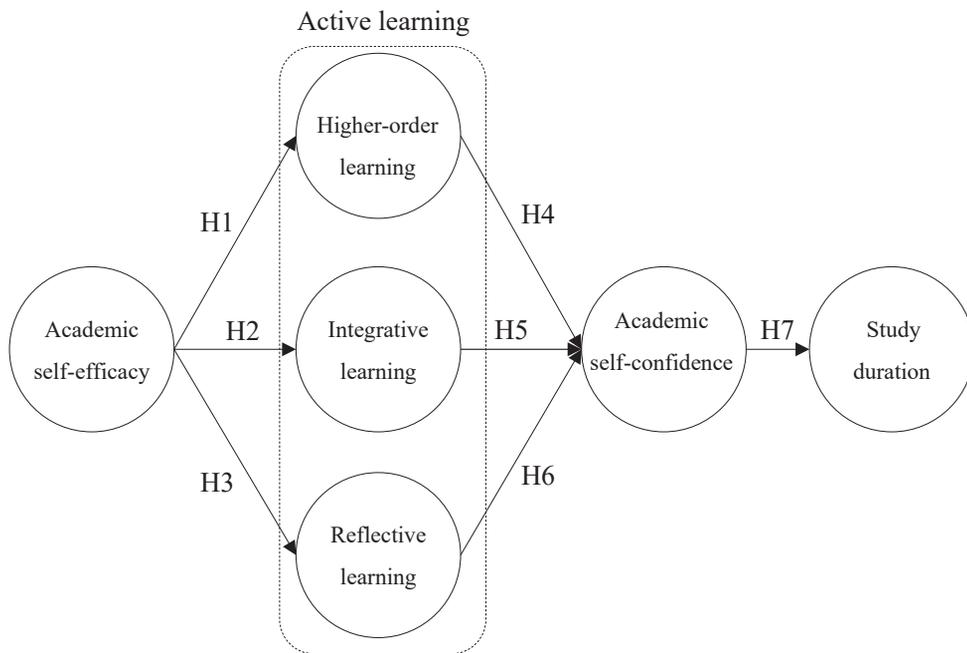
## Research Model and Hypotheses

### Research Model

Melville's (2010) belief-action-outcome (BAO) theory can effectively explain individuals' behaviors and final outcomes. In other words, the BAO framework explains how beliefs facilitate the execution of actions and how actions further influence outcomes (Molla et al., 2014). The study by Ho et al. (2020)

found that the model constructed through BAO is useful for understanding learning performance issues in higher education. Thus, BAO can help explain how people’s cognitive beliefs influence their actual actions (behaviors) and, ultimately, their outcomes or performance in educational settings. In this study, academic self-efficacy was considered as a belief, active learning strategies as an action, and academic self-confidence and study duration as outcomes. Accordingly, this study proposes a theoretical model for linking academic self-efficacy with three types of active learning (higher order learning, integrative learning, and reflective learning), academic self-confidence, and study duration. Thus, seven research hypotheses were proposed to construct the research model found in Figure 1 below.

**Figure 1**  
*Research Model*



**Hypotheses**

***Academic Self-efficacy Related to Three Types of Active Learning Strategies***

Relevant research has indicated that active learning methods can improve students’ participation in study by improving their analytical and conceptual thinking skills (Hall et al., 2004). Active learning has a positive impact on performance because of higher education. To focus on knowledge synthesis, active learning is required (Chotitham et al., 2014), and there is a correlation between self-efficacy and learning strategies (Wang et al., 2008). Self-efficacy and productivity also have a positive relationship (Phillips & Russell, 1994). Having a strong sense of self-efficacy allows learners to adhere to specific strategies (Anam & Stracke, 2016). Research suggests that online self-efficacy has a predictive effect on active learning, and that there is a significant positive correlation between them (Zhang, 2015). In addition, studies have shown a significant positive correlation between self-efficacy and active learning (Liem et al., 2008). Therefore,

based on belief-action in BAO, this study proposed the hypotheses for exploring how academic self-efficacy relates to active learning strategies:

H1: Academic self-efficacy is positively related to higher order learning.

H2: Academic self-efficacy is positively related to integrative learning.

H3: Academic self-efficacy is positively related to reflective learning.

### ***Three Types of Active Learning Strategies Related to Academic Self-confidence***

Self-confidence is a judgment of one's ability and quality. Confident people rely on their ability to face any event they encounter (Heinström, 2010). A change in self-confidence affects motivation and predicts the quality of performance (Geoffrion et al., 2013). A specific form of confidence is academic self-confidence, which refers to a person's confidence in their academic performance (Laird, 2005). Strong academic self-confidence comes from effective learning strategies (Valiee et al., 2016) as using more post-cognitive strategies can improve learners' self-confidence (Kisac & Budak, 2014). Therefore, based on action-outcome in BAO, how active learning strategies relate to academic self-confidence is hypothesized as follows:

H4: Higher order learning is positively related to academic self-confidence.

H5: Integrative learning is positively related to academic self-confidence.

H6: Reflective learning is positively related to academic self-confidence.

### ***Academic Self-confidence is Positively Related to Study Duration***

Confidence usually increases the motivation of a person's abilities (Bénabou & Tirole, 2002), and it is believed that increasing or decreasing self-confidence will improve or reduce performance (Hanton & Connaughton, 2002). One study suggested that psychological characteristics are critical to academic learning and success (Galla et al., 2014). Bearden et al. (2001) argued that self-confidence is related to decisions and behavior. Self-confident people will assign a higher value to success and a lower value to failure (Chaouali et al., 2017). For example, academic self-confidence can be an important predictor of problems with study orientation and academic performance (van der Aar et al., 2019). In addition, excellent performance in competitive sports is also associated with good self-confidence (Comeig et al., 2016). High self-confidence, known specifically as athletic confidence, is considered to be the key psychological characteristic required by elite athletes in order to promote optimal performance (McGinn et al., 2018), and self-confidence is also considered to be the best predictor of academic subjects such as mathematics and English (Stankov et al., 2012). Therefore, based on the confidence-behavior model (Keller, 2009), how academic self-confidence and study duration are related is hypothesized as follows:

H7: Academic self-confidence is positively related to study duration.

## **Method**

### **Procedure**

The questionnaires were targeted at full-time postgraduate students studying in Taiwan. An online questionnaire (Google Forms) was developed and posted on some graduate student social networks, and Facebook was used to inform the participants in those social networks. Adopting a snowball sampling approach, we asked the questionnaire receivers to share the link of the questionnaire website with other graduate students they were acquainted with. Questionnaires were collected from June 16 to September 30, 2018, until there were 350 returns.

## Participants

The participants in this study were all master's degree students enrolled in graduate study in that semester. A total of 245 participants' useful questionnaires were returned, of which 91 (37.1%) were from males and 154 (62.9%) from females. Regarding the studying institutes, 194 (79.2%) participants were from public universities, and 51 (20.8%) were from private universities. As for the types of university, 153 students were from general universities (62.4%) and 92 were from technological universities (37.6%). Regarding their majors, 173 (70.3%) were majoring in social science and management, while 72 (29.7%) were from natural science, engineering, and related majors. Among the participants, 84 (34.3%) graduated on time; for those who did not, the reasons were: incompleteness of thesis for 125 (51%), incompleteness of credits for 11 (4.5%), taking a teacher's education program for nine (3.7%), and personal factors for 12 (4.9%).

## Instruments

The questionnaire items were adapted from previous studies, and were translated into Chinese. Three domain experts were invited to check the accuracy, and then the questionnaire was sent to 20 graduate students to identify any unsuitable items. In line with this forward and backward process, statements were corrected until face validity was ensured. The questionnaire adopted a 5-point Likert scale (1 [strongly disagree] to 5 [strongly agree]) for participants to self-rate themselves so as to obtain the reliability and validity of the questionnaire items and constructs.

Academic self-efficacy measurement: Self-efficacy is an individual's belief in their own ability to effectively accomplish a task (Bandura, 1977), so according to this definition and reference, Hong et al.'s (2015) questionnaire for measuring students' self-efficacy in learning was adapted for use in this study. The term academic self-efficacy is used in this study to refer to the postgraduate students' belief in their ability to complete their research (e.g., "In the course of my research, I can find out the details of the problem and have a solution to it" and "When faced with problems in the study process, I will develop multiple solutions").

Active learning strategies measurement: Active learning is a key strategy for students to extract meaning and understanding from course materials and experience (Warburton, 2003). This study was based on the Deep Strategy Learning Scale from Entwistle and McCune (2004). The active learning referred to in this study refers to the use of strategies for applying active learning. Exemplary items include: First, "In the process of solving a learning problem, I will classify and compare the problems before I take action" and "I always look for different ways before making assumptions when solving problems." Second, "I find myself thinking about the commonalities of different course content" and "I try to integrate ideas, information or experiences into new and more complex explanations and relationships." Finally, "I can reflect on something new from mistakes and change the way I understand problems or concepts" and "I will reflect on my own views on a topic or issue, and find out the advantages and disadvantages."

Academic self-confidence measurement: Self-confidence is a judgment of one's ability, quality, and self-confidence that affects motivation and predicts the quality of performance (Geoffrion et al., 2013). In this study, self-confidence enhancements are based on the above definitions and revisions, where the term academic self-confidence as used in this study refers to the students' self-confidence perception of conducting academic research. For example, "I am very self-learning oriented and have the confidence to do research" and "I am good at planning research design, so I am confident in my career development in academic research."

### Item Analysis

Items analysis was analyzed with first-order confirmatory factor analysis (CFA) (Hong et al., 2020), where items with a factor loading (FL) not larger than the value of .50 were deleted; the higher residual values in each construct were also canceled, until they met the threshold suggestions of Hair et al. (2019) (see Table 1). Then, the number of items was reduced from eight to six for academic self-efficacy, from seven to four for higher order learning, from seven to five for integrative learning, from eight to four for reflective learning, and from seven to five for academic self-confidence, as shown in Table 1.

**Table 1**  
*Item Analysis*

Index	Threshold	Academic self-efficacy	Higher order learning	Integrative learning	Reflective learning	Academic self-confidence
$\chi^2$	---	28.1	2	31.1	.9	3
<i>df</i>	---	9	2	9	2	5
$\chi^2/df$	< 5	3.12	1	3.46	.45	.60
RMSEA	< .10	.09	.02	.09	.01	.01
GFI	> .80	.96	.99	.96	.99	.99
AGFI	> .80	.914	.98	.90	.99	.90

### Reliability and Validity Analysis

In this study, the value of Cronbach's  $\alpha$  ranged from .84 to .88 and the value of CR ranged from .83 to .88, indicating that the internal consistency and composite reliability (CR), and average variance extracted (AVE) ranged from .50 to .57 and the Factor Loadings (FL) ranged from .71 to .76, indicating that the convergence validity of this construct was acceptable, as shown in Table 2.

**Table 2**  
*Reliability and Validity Analysis*

Constructs	<i>M</i>	<i>SD</i>	$\alpha$	CR	AVE	FL
Threshold	--	--	> .70	> .70	> .50	> .50
Academic self-efficacy	3.61	.57	.88	.88	.51	.74
High level learning	3.73	.58	.84	.84	.57	.75
Integrative learning	3.72	.55	.86	.86	.54	.74
Reflective learning	3.85	.55	.84	.84	.57	.76
Academic self-confidence	3.68	.52	.86	.83	.50	.71

Note. *M* = mean; *SD* = standard deviation; FL = factor loading; CR = composite reliability; AVE = average variance extracted.

## Results

### Study Duration Analysis

The first paragraph of Article 26 of Taiwan's University Act (2015) stipulates that the term of study for a master's degree is 1 to 4 years. However, at present, most schools in Taiwan have dispersed the master's degree courses over four semester-long classes and the analysis in this study showed that the average

duration of the course is 5.22 semesters, which means that the master's students only obtained their degree on average in the second semester of their 3rd year, as shown in Table 3. The number of participants who studied for 4 semesters or less was 84 (34.3%), 5 semesters was 55 (22.4%), 6 semesters was 79 (32.2%), 7 semesters was 22 (9%), and 8 semesters or more was 5 (2%), as shown in Table 4.

**Table 3**  
*Study Duration Analysis (semester)*

Construct	Min	Max	<i>M</i>	<i>SD</i>	Med.
Study duration	4	8	5.22	1.08	5

**Table 4**  
*Descriptive Analysis of Study Duration*

Study duration	Frequency (percentage)
4 semesters (or less)	84 (34.3%)
5 semesters	55 (22.4%)
6 semesters	79 (32.2%)
7 semesters	22 (9.0%)
8 semesters (or more)	5 (2.0%)

### Model Goodness of Fit Test

A good model adaptation represents the validity of the model construction. Relevant scholars have recommended a value of  $\chi^2/df$  to be less than 5 (Hair et al., 2010), RMSEA should be less than .1, GFI, AGFI, NFI, NNFI, IFI, and RFI should be greater than .80, while RMR should be greater than 0.05 (Abedi et al., 2015). PNFI and PGFI should be greater than .50 (Abedi et al., 2015). In this Model goodness of fit test,  $\chi^2 = 520.25$ ,  $df = 269$ ,  $\chi^2/df = 1.93$ , RMSEA = .06, RMR = .06, GFI = .86, AGFI = .83, NFI = .85, NNFI = .91, IFI = .92, RFI = .83, PNFI = .76, and PGFI = .71. The values of the fitting indicators in this study are in line with scholars' recommendations.

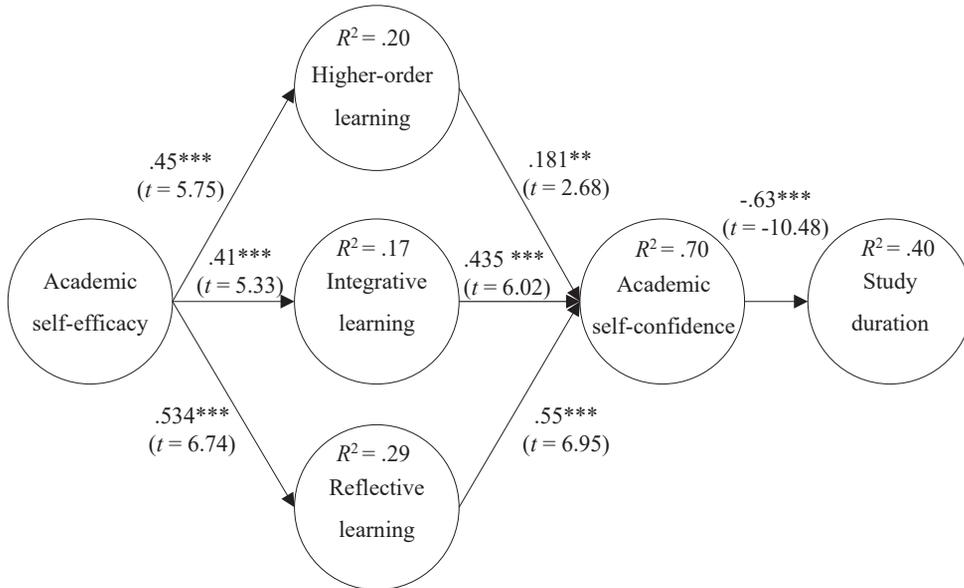
### Path Analysis

In structural equation modeling (SEM), path analysis is an extension of multivariate regression because it includes numerous multivariate regression models or calculations that are assessed at the same time. This delivers a more effective and direct way to model mediations, indirect effects, and other multifarious relations between variables (Lei & Wu, 2007). Although multi-group validation factor analysis can help assess and validate measurement invariance to ensure that the instrument is used fairly and is not biased towards certain groups of key questions (Ullman & Bentler, 2012), this study was based on verifying the effects of the BAO framework on graduate study duration, so no comparison between different models was conducted.

The SEM verification results showed that academic self-efficacy has a significant impact on higher order learning ( $\beta = .45^{***}$ ,  $t = 5.75$ ); academic self-efficacy has a significant impact on integrative learning ( $\beta = .41^{***}$ ,  $t = 5.34$ ); academic self-efficacy has a significant impact on reflective learning ( $\beta = .534^{***}$ ,  $t = 6.74$ ); higher order learning has a significant impact on academic self-confidence ( $\beta = .18^{**}$ ,  $t = 2.68$ ); integrative learning has a significant impact on academic self-confidence ( $\beta = .44^{***}$ ,  $t = 6.02$ ); reflective learning has a significant impact on academic self-confidence ( $\beta = .55^{***}$ ,  $t = 6.95$ ); and finally, academic self-confidence has a significant impact on study duration ( $\beta = -.63^{***}$ ,  $t = -10.48$ ). Academic self-efficacy

has an explanatory power of 20.2% for higher order learning, 17% for integrative learning, and 29% for reflective learning. Academic self-confidence has an explanatory power of 70%, with an explanatory power of 40% for study duration, as shown in Figure 2.

**Figure 2**  
*Research Model Verification*



\*\*  $p < .01$ . \*\*\*  $p < .001$ .

**Indirect Effects Analysis**

The results of this study verified that the 95% confidence interval for neither the direct nor the indirect effects crossed zero (Nakagawa & Cuthill, 2007). In terms of the indirect effect, academic self-efficacy is indirectly positively related to academic self-confidence ( $\beta = .55^{**}$ ), and academic self-efficacy has an indirect negative relationship to study duration ( $\beta = -.35^{**}$ ); higher order learning and study duration have an indirect negative relationship ( $\beta = -.11^*$ ); and integration learning has an indirect negative relationship to study duration ( $\beta = -.27^{**}$ ). Reflection learning has an indirect negative relationship to study duration ( $\beta = -.34^{**}$ ), as shown in Table 5.

**Table 5**  
*Indirect Effect Analysis*

Constructs	Academic self-efficacy		Higher order learning		Integrative learning		Reflective learning	
	$\beta$	95% CI	$\beta$	95% CI	$\beta$	95% CI	$\beta$	95% CI
Academic Self-confidence	.55**	[.43, .65]						
Study duration	-.35**	[-.43, -.26]	-.11*	[-.23, -.03]	-.27**	[-.37, -.19]	-.344**	[-.44, -.24]

\*  $p < .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

## Difference Analysis

The results of the *t* test revealed significant differences in the constructs of reflective learning, academic self-confidence, and study duration between the participants of the two subject areas. Among them, students majoring in natural science and engineering fields showed a greater reflective learning and academic self-confidence when compared to students majoring in social science and management. In addition, students majoring in natural science and engineering showed a lower study duration when compared to social science and management students, as shown in Table 6.

**Table 6**  
*Difference Analysis*

Constructs	Group	<i>N</i>	<i>M</i>	<i>t</i>	Compare	<i>d</i>
Academic self-efficacy	1	173	3.57	-1.83		.25
	2	72	3.71			
Higher order learning	1	173	3.69	-1.56		.21
	2	72	3.82			
Integrative learning	1	173	3.68	-1.67		.24
	2	72	3.81			
Reflective learning	1	173	3.79	-2.39*	2 > 1	.35
	2	72	3.98			
Academic self-confidence	1	173	3.62	-2.68**	2 > 1	.37
	2	72	3.81			
Study duration	1	173	5.35	2.89**	1 > 2	.40
	2	72	4.92			

Note. 1. Social science and management, 2. Natural science and engineering.

## Discussion

Honicke and Broadbent (2016) pointed out that academic self-efficacy is a self-recognition or an individual's belief in his/her ability to perform at a specified level. Even in the face of academic challenges, it is not easy to compromise, and the participants in this study have good academic self-efficacy ( $M = 3.72$ ,  $SD = 4.24$ ). Scouller (1998) indicated that students are likely to adopt active learning methods when preparing term papers. In this study, participants' perceptions of using active learning strategies were higher order learning ( $M = 3.61$ ,  $SD = .57$ ), integrative learning ( $M = 3.27$ ,  $SD = .58$ ), and reflective learning ( $M = 3.85$ ,  $SD = .55$ ). Galla et al. (2014) showed that psychological characteristics are critical to academic learning and success. The participants in this study were found to have academic self-confidence ( $M = 3.68$ ,  $SD = .52$ ).

### Academic Self-efficacy was Positively Related to Active Learning

Anam and Stracke (2016) stated that having a strong sense of self-efficacy allows learners to adhere to specific strategies, while Wang et al. (2008) showed that there is a correlation between self-efficacy and learning strategies in distance education-related research. In addition, Anam and Stracke stated that students with higher English efficacy and self-regulating learning effectiveness reported learning strategies more frequently than students without higher significance. In an educational study, self-efficacy is a positive

predictor of the relationship between active learning methods (Liem et al., 2008). At the same time, Zhang (2015) found that online self-efficacy has a predictive effect on active learning, and also found a significant positive correlation between the two. The results of this study show that academic self-efficacy does have a positive correlation with active learning, echoing the literature above.

### **Active Learning Strategies were Positively related to Academic Self-confidence**

Valice et al. (2016) found that good self-confidence comes from effective learning strategies. Smith et al. (2018) stated that the specific impact of active learning techniques on confidence and test scores will certainly provide more insight, but due to institutional constraints, the approach is complicated. Kisac and Budak (2014) used more post-cognitive strategies to be more successful in improving learners' self-confidence. In addition, Gordon and Debus (2002) stated that the promotion of the use of in-depth methods has brought varying degrees of success. The results of this study show that the strategy of using active learning is positively related to academic self-confidence.

### **Academic Self-confidence was Negatively Related to Study Duration**

There is ample evidence that self-confidence affects performance, while positive self-confidence can improve performance (Compte & Postlewaite, 2004). Other studies have pointed out that if students lack self-confidence, their performance will certainly be hindered (Saini, 2016). Many studies have confirmed that self-confidence strongly influences learning and performance achievements in various fields. In order to achieve excellent athletic performance, for example, it is usually thought that athletes are required to have a great amount of self-confidence (Vealey & Chase, 2008). As another example, Ganley and Lubienski (2016) confirmed the potential reciprocal relationship between mathematics achievement and self-confidence. Ku et al. (2014) indicated that many students lack confidence in learning mathematics, which may lead them to abandon the pursuit of more mathematics knowledge, which will directly and indirectly affect their learning performance and achievements. Students' self-confidence will also have a solid effect on their high school achievements (Tavani & Losh, 2003). The study duration was also considered as the overdue performance of the participants in accordance with the definition proposed by Ho et al. (2020). Based on the confidence-behavior model (Keller, 2009), the results of this study show that academic self-confidence was indeed negatively related to study duration.

### **The Difference in Academic Field**

Human's life learning is a difficult trip over observation and involvement of the world. However, the procedure of learning in engineering and natural sciences is a route which needs much observational involvement and physical experiments (Montáns et al., 2019). Natural science and engineering jobs involve much interaction with data and things (Ballesteros et al., 2021). On the other hand, social science and humanities jobs involve much interaction with data and people (Shu et al., 1996). Based on the difference in interacting with people, data, and things, there are differences in relation to students' studying field (Smeby, 2000).

Social influence is defined as how a person in a social network is affected by the behavior of others to adapt to group behavior patterns (Venkatesh & Brown, 2001). Social influence lies in making explicit the interactivism of the action-based conception and proposing an account of the fundamental aspects of social identity (Mirski & Bickhard, 2021). A "we perspective" is essential both for the daily coordination of human actions and in assisting to constitute people's collective social identity and actions (Goddard & Wierzbicka, 2021). The frame of coordinating social interaction in the community encultures individuals to their mental-state attribution to the culture of that community (Mirski & Bickhard, 2021). In line with this,

individuals in different frames of communities may have different “we perspectives” on graduation.

The present study also validates the arguments of the above study. The present study compared the duration of graduate study between subject areas, and found that students enrolled in graduate school in the management and social sciences took longer to complete their degrees than those in natural science and engineering. The reason may be due to the fact that students majoring in management and social science bridge and bond human or culture-related learning materials, so they claim that they have little time to learn so much knowledge, which makes them have less confidence in their ability to meet occupation requirements (Yang, 2018). Moreover, the results of this study revealed that the constructs of reflective learning strategies and academic self-confidence were significantly higher for students in natural science and engineering than for those in social science and management; this result is supported by a study of Horton et al. (2021) which indicates that the incorporation of reflective journaling for students can be seen as a mechanism for promoting self-confidence to overcome challenges.

## Conclusion

Current research on higher education tends to focus on performance in particular subject areas. Based on this, the purpose of this study was to explore the relevant factors affecting the duration of master's courses, and to use the BAO theory to verify a theoretical model through structural equation modeling. The results showed that academic self-efficacy and active learning (high level, integration, and reflection) are positively related; active learning (high level, integration, and reflection) was also positively related with academic self-confidence, while academic self-confidence was negatively related with study duration. Active learning was also indirectly negatively related with study duration. In addition, although the three types of active learning were most strongly related with academic self-confidence and study duration, reflective learning was most strongly related with these two constructs, integrative learning was second, and higher order learning was last.

Although in this study SEM helped us to understand the factors contributing to the study delay in study duration, this analysis is a confirmatory rather than exploratory statistical technique and also has some interpretative limitations. Specifically, the validation results of this study are suitable for explaining the effect of active learning strategies on delayed graduation. Other intrinsic or extrinsic factors that affect graduate students' study duration were not combined in the model of this study to jointly explain the effects of delayed years of study.

In addition, this study found that the average duration of a master's degree program in Taiwan was more than 5.22 semesters, and on average, students did not receive their master's degree until their third year, indicating that many master's students tried to postpone assumption of their social roles. This phenomenon is a problem that is worthy of attention, and action should be taken to ameliorate the situation.

Each discipline has its unique cultural characteristics, but in the research and policy formulation of higher education, the assessment of departmental differences is often neglected (Becher, 1994). There is a special phenomenon in Taiwan's higher education system. Under the same rules of practice, graduate students in the humanities and social sciences generally spend more semesters than graduates in the natural sciences. In addition, because of the differences that exist in different disciplines, this also means that different disciplines have different approaches or emphases in the mentoring of professors. In addition to the level of competence of the active learning strategies of the graduate students, the mentoring process should be taken into account. At the same time, it is also necessary to design a more appropriate supervision mechanism by focusing on the soft dimension degree thesis to be able to explain and understand their contributions and the hard dimension degree thesis to be able to prove the experimental results, so that the students can reach the requirements of the graduate school more quickly and shorten the study duration.

## Implications

For the multiple levels of mediation analysis, the two requirements were tested according to Baron and Kenny (1986): (a) there should be a predictor as the level of independent variable to affect the level of mediator; and (b) after entering the mediator, the relationship between the level of predictor and the dependent variable will come to an end. The results of this study revealed that three types of active learning approaches play the role of mediator between academic self-efficacy and the study duration, indicating that those approaches should be considered timely by those students who cannot complete their master's degree in the expected number of semesters.

The result indicated that reflective learning was highest and was negatively related to postponement of schooling duration; accordingly, the school administration system and faculties may guide those students with less ability to reflect on their learning, or provide them with counseling by academic advisors to help them develop better approaches.

Additionally, the results of the study confirm that academic self-efficacy positively affects active learning strategies, so when instructors identify students in the low self-efficacy group, they should first help them develop a good sense of self-efficacy to help them cope with academic activities.

In addition, in the past, the BAO model was generally used to explain people's use of information technology, and is a theoretical model that effectively explains phenomena from the macro level to the micro level. BAO has been less applied in the field of education in the past. However, in this study, it was reconfirmed that BAO can be used to explain the relationship between people's beliefs about education-related behaviors and subsequent outcomes in specific educational contexts, as well as to expand the understanding of learning or educational behaviors by developing cognitive-behavior-based research models for educational scholars.

## Limitations and Future Study

Supervising is the mainstay of improving the learning environment for students throughout higher education. A number of studies have shown that supervision is one of the most important factors in promoting graduate students' successful academic and postgraduate academic experience (Beaudin et al., 2016). In a follow-up study, if the number of weekly supervision discussions or supervision styles can be studied and analyzed, then more factors affecting the duration of taking courses at the postgraduate level can be analyzed.

In social psychology, it is increasingly recognized that social influences play an important role in students' academic performance (Fan, 2011), such as group culture among students, which may also be a factor in delaying completion of studies. However, this component was not explored in this study. Therefore, in future research, the influence of peer group culture and learning atmosphere on study completion can be further investigated.

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# 碩士班修業時程：基於信念—行動—結果模式的主動學習之效果

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臺灣因受儒家思想影響，致使學習者從學校到工作場域的社會角色之轉化有所延遲；也就是說大多數學生在取得高等教育學位後，才進入就業市場。然而，近年來研究所學生的研修問題已成為一項須被重視的議題。為了解這個問題，本研究針對已完成課程及學位論文的研究所畢業生或準畢業生參與問卷調查。而本研究目的旨在探討學習者的學術自我效能如何影響其主動學習策略、學術自信心，以及如何影響修業時程。本研究共獲得 245 份有效問卷，包括 91 位男性填答者及 154 位女性填答者。此外，研究參與者中有 34.3% 準時畢業，因為論文而未準時畢業者則占 51%。本研究採用驗證性因素分析，研究結果顯示：學業自我效能感與主動學習策略（高層次、整合、反思）呈現正相關；且主動學習策略與學業自信心呈現正相關；但學術自信心與碩士修業時程則呈現負相關。

**關鍵詞：**學術自我效能、學術自信心、主動學習策略、信念—行動—結果模式、修業時程