



## Associations Between Perceived Self-Efficacy, Perceived Value, and Academic Achievement: Exploring a Gender Difference Within English-Medium Instruction\*

Jiyoon Lee\*\*

University of Maryland, Baltimore County

Hye Won Shin

Impact Research Lab

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### ABSTRACT

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The purpose of the present study was to investigate the relationship between two subconstructs of motivation, perceived self-efficacy and perceived value and students' academic achievement in an EMI context with special attention to students' gender differences. While English-Medium Instruction (EMI) has been the subject of much interest, little is known about whether motivational subconstructs, students' perceived self-efficacy and perceived value, have any connection to students' academic achievement in an EMI environment. To investigate this issue, we looked closely at the effects of perceived self-efficacy and perceived value on 65 second- and third-year business school students' academic achievement in EMI courses and also looked specifically at the relation between students' gender and their perceived self-efficacy and perceived value. Controlling for individual and group-level characteristics, an OLS regression analysis showed that students' perceived self-efficacy had a significant impact on their academic achievement. A further analysis found significantly higher perceived self-efficacy among the female students than among the male students. These findings provide tentative support for the claim that perceived self-efficacy can help to explain certain differences in academic achievement, with regard to gender.

### I. INTRODUCTION

The present study investigated the relationship between two subconstructs of motivation, perceived self-efficacy and perceived value and learners' achievement in two En-

glish medium instruction (EMI) courses. While extensive research studies on learner motivation have enhanced our understanding of the relationship between motivation and second language (L2) learning in general, considering that motivation is multi-faceted and diverse L2 learning

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\*\* First author: Jiyoon Lee (University of Maryland, Baltimore County, Assistant Professor), Corresponding author: Hye Won Shin (Impact Research Lab, Research Scientist)

Jiyoon Lee

Dept of Education, University of Maryland, Baltimore County, 1000 Hilltop Circle, Baltimore, MD, 21250, USA  
Tel: (1-410) 455-1740 / Email: [jiyoon@umbc.edu](mailto:jiyoon@umbc.edu)

Hye Won Shin

Impact Research Lab, 222 Wangsimni-ro, Sungdong-gu, Seoul, 04763, Korea  
Tel: (02) 2220-2690 / Email: [coletteshin@gmail.com](mailto:coletteshin@gmail.com)

contexts have emerged, the need of in-depth investigation of motivation subconstructs has increased. Motivation has been broadly defined and explained in previous research with varied subconstructs including stakeholders' beliefs, perceptions, and preferences. Research studies have also shown that motivation is a multi-faceted concept and may interact with a range of learner-variables including learners' gender and age as well as various contextual variables such as the setting and contexts of instruction.

EMI has been widely implemented in non-English speaking countries' universities to internationalize their campuses (Dearden, 2015). Although the EMI forms can vary greatly in terms of instructional goals and the degree of emphasis of language and content, it generally means course content delivered in English in an academic context where the majority of learners do not speak English as their first language (Macaro, Curle, Pun, & An, 2018).

Since the mid-2000s, research in EMI settings has drastically increased. These studies have explored government and university policies and incentives for implementing EMI, the beliefs and expectations of EMI stakeholders (including instructors, students, and administrators), and comparisons of EMI versus non-EMI environments in relation to student participation, attitudes, and achievements. For instance, S. Hwang (2013) surveyed 50 engineering students about their perceptions of their EMI instructors' pedagogical strategies and EMI course effectiveness. The study showed that the students perceived EMI was effective in learning engineering-related vocabulary and improving English reading ability. However, they were not satisfied with engineering content learning in EMI context. Recent studies have started examining the roles that contextual and learner-variables play in the success of EMI.

In general, foreign and second language instruction, research studies showed that learners' gender sometimes influence learners' intention to start or continue learning a foreign or second language. Some research studies also revealed that learners' gender was one of the deciding factors that influence learners' success in L2 learning. However, we do not have enough understanding of learners' gender and its relationship with learners' achievement and other learner variables such as the aforementioned motivation subconstructs in EMI settings. In response to the dearth of research, the present study was designed to look into learners' motivation and its relationship with learners' performance in two EMI courses at a university in South Korea. In this study, we examined two subconstructs, *perceived self-efficacy* and *perceived value*, and the role of learners' gender in relation to the two subconstructs and learners' performance. This study's findings enhance our understanding of the factors that may influence learners' performance in the particular instructional context of EMI in South Korea.

## II. LITERATURE REVIEW

### 1. Perceived Self-Efficacy and Perceived Value in English-Medium Instruction

Extensive studies on the role of learner motivation in L2 learning has been conducted last forty years, and they have generally confirmed that motivation is one of the strongest predictors of success in L2 learning. Motivation has been defined in various ways involving ranges of cognitive aspects, but it is typically understood to be related to a person's beliefs, perceptions, and preferences.

One particularly useful framework for investigating adult learners' motivation in foreign language contexts is the "expectancy-perceived value framework" (Gorges & Kindler, 2012). In this framework, motivation is associated with perceived self-efficacy and perceived value (Eccles, 1983; Wigfield & Eccles, 1992). Perceived self-efficacy refers to one's belief about his or her capability to successfully accomplish a goal (Bandura, 1997; Pajares, 1997). Pajares (1997) stated that perceived self-efficacy influences perceptions about the world and oneself, including one's intentions, choices, actions, efforts, and persistence in the face of difficulties. Bandura (1997) argued that a learner's positively perceived self-efficacy is a stronger predictor of his/her ultimate success than his/her skill, knowledge, or even prior experience of accomplishing a task successfully. The strong impact of positive beliefs and perceptions on how well one learns has been confirmed by many studies (Zajacova, Lynch, & Espenshade, 2005).

Not many studies have been conducted in L2 learning setting to examine the relationship between perceived self-efficacy and perceived value and learner's achievement. One of the few examples is Mills, Pajares, and Herron's (2007) study, which investigated the relationship between intermediate French students' perceived self-efficacy and achievement. Surveying 303 college students who were enrolled in intermediate-level French classes, the researchers confirmed that those who had higher perceived self-efficacy monitored their work more effectively, which led to higher achievement. They found that regardless of learners' background or experience, perceived self-efficacy was a strong predictor of learners' high grades. It has been argued that those with low perceived self-efficacy tend to lose interest in learning a foreign language more easily and will give up on the knowledge or skills they have worked to gain more quickly than those who have high perceived self-efficacy (Doğan, 2016).

Examining 192 ninth graders in South Korea, Hsieh and H. Kang (2010) also confirmed that perceived self-efficacy was positively correlated with learner success. In their study, students' achievement was measured by self-reported scores on English tests, and their perceived self-efficacy was measured by an item that asked them to indicate their perceived self-efficacy on a scale of 0 to 100. Hierarchical regression analysis corroborated that perceived self-efficacy was a stronger predictor of test scores than attributions. While they also showed the statistically meaningful information from their analysis,

the one-item perceived self-efficacy measurement used in this study may undermine the reliability and validity of these findings. In addition, their argument can be more persuasive if they described the nature of the language tests that were used as a measure of students' achievement (e.g., whether they tested for grammar, vocabulary, reading, or writing). I. Jeon (2010) noted that the focus of language tests in Korean secondary schools have been primarily on reading skills. It could very well be that Hsieh and H. Kang examined learners' L2 reading ability, and not overall L2 achievement. Moreover, the researchers did not report which of the two language tests they administered was used as the dependent variable in their multiple regression models. As a consequence, it is unclear whether their findings are measuring students' L2 skills at the beginning, middle, or end of the course. Considering the importance of perceived self-efficacy in language learning success, efforts are needed to conduct studies with stronger methods of measurement.

Perceived value is another important component of the expectancy-perceived value framework. Perceived value refers to a student's interpretation of the value of a course in which he or she is enrolled. This concept has been widely researched in the fields of general education and adult education. Some researchers have operationalized perceived value as student autonomy or a key connector between teaching and learning (Walker, Pressick-Kilborn, Arnold, & Sainsbury 2004; Woolf & Quinn, 2009). A shared premise in all previous studies of perceived value was that the higher a student's perceived value of a course or a learning experience was, the more the student would engage in the course and learn the subject (Woolf & Quinn, 2009). The findings generally found this to be the case (Eccles, 1983; Hsieh & H. Kang, 2010).

In the present study, the authors paid particular attention to students' perceived value of particular courses. We defined perceived value of a course as a learner's belief that the course would be beneficial to him or her in the future. Previous research studies have shown a close relationship between perceived value of tasks/courses, self-efficacy, and performance (Pintrich, Wolters, & Baxter, 2000; Varasteh, Ghanizadeh, & Akbari, 2016). To give one example, Y. Joo, K. Lim, and J. Kim's (2013) study, which featured a structural equation analyzing the survey results of 897 participants enrolled in online education courses, found that both perceived self-efficacy and perceived value were significant predictors of student satisfaction and achievement. Research on perceived value in learning suggests that it is an influential predictor of which tasks and courses a student will choose (Wigfield & Eccles, 1992). Studies have also shown that when students perceived a task or course to be of high perceived value, they used more cognitive strategies and engaged in their work more actively (Varasteh et al., 2016). Varasteh et al. (2016) investigated the relationship of cognitive, motivational, and metacognitive variables among 180 EFL learners. They found that those who attributed higher perceived value to their work adopted more strategies to learn English, which led to higher GPAs than those who did not.

In summary, studies that examined the relationship between perceived self-efficacy and perceived value and learn-

ers' achievement have generally found that the two variables are positively correlated with learners' achievement in L2 learning. And yet, despite the great power of self-efficacy, only a handful of studies have sought to better understand the impact of perceived self-efficacy in EMI settings. However, it is critical to understand the differences between EMI and general foreign/second language instructions. It is an instructional approach where instructional emphases on content and language are varied, which may attract learners with diverse intentions and motivations. In addition to expanding the expectancy-perceived value framework to EMI settings, the present study also revisited instruments used in previous studies that made use of the expectancy-perceived value framework.

## 2. Gender Difference in Language Learning

An important variable that the current study considered was gender. Previous studies have consistently found that female students are usually more motivated to learn foreign languages than their male counterparts (Kissau, 2006; Ryan, 2009). Furthermore, studies also show that female learners outperform male learners in foreign language learning regardless of instructional settings, age groups, or target forms. Some researchers have argued that, in many cultures, learning a foreign language is associated with femininity, and that this is why women are more likely to be attracted to foreign languages, and they are more dedicated in learning foreign languages than male students. For instance, Kissau (2006) provided strong evidence to support this argument. He surveyed 500 ninth graders in Ontario, Canada to investigate whether students' gender impacted their motivation for learning French and the possible reasons. His study examined 18 variables including a range of motivation subconstructs, goals, environmental factors, and tolerance of ambiguity. This large-scale survey study was followed by a focus group interview with eight students and six teachers. Using a Discriminant Function Analysis, Kissau sought to identify the variables that distinguished male and female students, the relative importance of gender-related variables, and the variables' ability to classify male and female students. He found that male students were less motivated to learn and maintain their abilities and proficiency in French than female students. He further found that the "desire to learn French" and motivation subconstructs were accurate predictors of the gender differences in foreign language learning. The male participants in his study said that they received a negative social appraisal from their peers for their decision to continue with French.

Although there is a relatively extensive body of research on gender roles in foreign language instruction, there exists only a handful of research on gender roles in EMI settings specifically. Furthermore, the research findings about learners' gender and its relationship with learners' performance in EMI contexts do not always support the general trend noted in general foreign language contexts. Lasagabaster's (2016) research on the relationships among a student's motivation, gender, and L1 is one of the few studies to address the question of gender roles in an EMI setting. He surveyed 189

students enrolled in EMI courses in the Basque Country. The participants were mostly bilinguals who were learning English as a third language. He did not find that female students were more motivated than male students, or that they had different self-perceptions about their success in an EMI environment. He speculated that the focus on content (rather than language instruction) might have diminished the gender effect. If the main emphasis of an EMI setting is on the content, with English being merely a vehicle to convey that content, it is possible that male students would not view language learning as belonging in the “feminine” realm of academic study. In any event, more research should be conducted to acquire more conclusive answers about the extent of gender effects in EMI settings.

The present study sought to closely examine perceived efficacy and value and a potential background factor in the EMI context in order to facilitate a deeper understanding of students’ academic achievement. Based on our review of previous research, the following two questions guided our study:

- 1) To what extent do students’ evaluations of (a) their perceived self-efficacy in a class and (b) the perceived value of that class affect their academic achievement?
- 2) Are there consistent differences in how males and females make these assessments? In investigating these questions, the authors aimed to further contribute to the ongoing research in the EMI literature.

### III. METHOD

#### 1. Participants and Context

Participants were 65 students enrolled in two courses related to business administration at the business school of one of the most competitive universities located in Seoul, South Korea. While the participants’ actual university admission scores nor language proficiency information is available, considering Korean contexts, most students enrolled in the university and the business school might be at least intermediate in English proficiency.

Since the mid-2000s, with the strong support of the Ministry of Education (MOE), Korean universities increased EMI offerings as endeavors to promote academic collaboration between Korean scholars and the rest of the world and increase Korean workers’ competitiveness in the global job market (Piller & J. Cho, 2013). In the university in which the current study was conducted, the students had ample opportunities to select EMI courses, as at least 40% of the course offerings at the business school were EMI. The two EMI courses involved in the current study were electives in business school and generally taken in a student’s sophomore or junior year. The requirements for the courses included one short essay assignment, a final project that required 15-minute team presentation towards the end of the semester, and a final examination. The professor was a faculty member at the

business school serving as an associate professor of business at the time of the study and had eight years of higher-education teaching experience taught both courses in English both in the U.S. and in Korea. One course had 32 students, and the other had 33. More male students ( $n = 39$  or 60%) than female students ( $n = 26$  or 40%) participated in the study. The students ranged in age from 19 to 22 years old.

#### 2. Instruments and Procedures

The participants completed a self-report that the instructor of the courses collected towards the end of the semester (see Appendix 1). The self-report took the form of a series of statements about perceived value and efficacy on a seven-point scale ranging from “not at all true of me” (1) to “very true of me” (7). The questions were adapted from previous investigations completed by Dafouz and Camacho-Minaño (2016) and Hardré and Reeve (2003). Specifically, three items from Dafouz and Camacho-Minaño’s (2016) study were used to evaluate a student’s confidence about his or her ability to perform in an EMI setting. These items were “I expect to do well in this class,” “I’m confident I can do an excellent job on the assignments and tests in this class,” and “I’m confident I can master the skills being taught in this class.” The  $d$ -index for this subscale ranged from .48 to .69 and Cronbach’s  $\alpha$  study was .76.

To capture the perceived value of the course, a three-item instrument was adapted from Skinner, Kindermann, and Furrer (2009). The three items were: “Most of what I learn in class is valuable,” “I perceived value in class-related activity and work,” and “It is very clear to me how valuable and how useful what I am learning in class will be in my career.” The subscale score reliability was good (Cronbach  $\alpha = .78$ ) and the  $d$ -index in the sample ranged from .60 - .65. Overall, the two scales employed for the sampled population had a good discrimination index ( $d$ -index) ranging from .50 to .71 and an internal consistency estimate (i.e., Cronbach’s  $\alpha$ ) of .83.

Academic achievement was measured by the final course grade, obtained by calculating the average score of assignment, team project, and final exam score. These grades ranged between 0 and 100, with higher scores representing higher course achievement. In the week after the final exams for the courses were administered, researchers accessed the participants’ academic achievement measures. All students consented to participate in the study.

#### 3. Data Analyses

To examine how the data explained students’ perceptions of perceived self-efficacy and perceived value, a series of Ordinary Least Squares (OLS) regression analyses were performed to estimate statistical significance. Although a statistical technique like structural equation modelling estimates and tests theoretical perspectives, we did not have sufficient sample size to fit the hypothesized model to data. Therefore, we used OLS regression to address the research questions and the following estimated regression equation illustrates the hypothesized model.

$$ACHIEV_i = \beta_0 + \beta_1 EFF_i + \beta_2 PERCEIVED\ VALUE_i + \beta_3 CLASS_i + \beta_4 GENDER_i + \varepsilon_i$$

$ACHIEV_i$  represents the outcome score for the student  $i$ . Coefficient  $\beta_0$  is the intercept for student  $i$ . Slope coefficients  $\beta_1$  and  $\beta_2$  are the independent variables, efficacy and perceived value, respectively. Coefficients  $\beta_3$  and  $\beta_4$  represent the control variables, class and gender, respectively, which were included in order to improve the precision of the estimation. Residual  $\varepsilon_i$  is the error term or disturbance for student  $i$ .

The authors estimated student achievement scores for all participants and for each gender. The R-squared and adjusted R-squared statistics serve as measures of model fit, and a traditional cut-off  $p$ -value of .05 was used to determine the level of significance. All analyses were carried out in Stata 14 (StataCorp., 2015)

## IV. RESULTS AND ANALYSIS

### 1. Descriptive Statistics and Correlational Analysis

Table 1 shows the means, standard deviations, and minimum and maximum scores for each of the variables and contains the results of the correlation analyses conducted on each of the motivation subconstructs and the achievement score. For the perceived self-efficacy and perceived value variables, higher scores indicated higher levels of perceived self-efficacy and perceived value, with the mean scores ranging from 3.00 to 7.00 and 3.67 to 7.00, respectively.

The analysis of the bivariate correlations showed associations between the outcome measure and the predictors. As can be seen in the table, the strength of these relationships is moderate to high. Specifically, Pearson correlation analyses indicated student achievement was positively and significantly associated with perceived self-efficacy ( $r = .46, p < .05$ ) and perceived value ( $r = .40, p < .05$ ). Statistically significant positive correlations were also found between perceived self-efficacy and perceived value,  $r = .63, p < .05$ . The other remaining variables' associations were low ( $r \leq -0.12$ ) and not statistically significant.

**TABLE 1**  
Descriptive Statistics and Bivariate Correlations of All Measures ( $N = 65$ )

	<i>M</i>	<i>SD</i>	Min	Max	Correlation			
					1	2	3	4
1. Achievement	95.73	8.76	65.47	109.97	1.00			
2. Self-efficacy	5.32	1.00	3.00	7.00	0.46*	1.00		
3. Perceived value	5.99	0.81	3.67	7.00	0.40*	0.63*	1.00	
4. Gender	0.40	0.49	0.00	1.00	0.19	-0.12	0.03	1.00

Note.  $M$  = mean;  $SD$  = standard deviation; min = minimum; max = maximum \* $p < .05$

### 2. Regression Analysis

Testing the specification of the hypothesized regression

model included linearity, normality, homoskedasticity, and multicollinearity (see Appendices 2-5). Appendix 2 shows a graphical representation of an observed and predicted achievement score which indicated a linearity relationship between the variables. Appendix 3 shows a standardized normal probability plot for non-normality. Additional non-graphical test for normality (i.e., Shapiro-Wilk test) was conducted and found that the distribution of the residuals was normal ( $W = 0.98, p\text{-value} = .33$ ). To test for homoskedasticity, we plotted residuals versus predicted values (see Appendix 4) and observed that the residuals were constant. Lastly, we tested the regression model for multicollinearity by examining variance inflation factor. The analysis indicated that independent variables were not perfectly multicollinear (see Appendix 5). In other words, there was no indication of multicollinearity in the regression model.

Table 2 provides the results to the three multiple regression models. The analysis revealed that the individual and class-level characteristics together explained 31% of the variance in students' evaluations of their academic achievement (Model A). Specifically, responses pertaining to perceived self-efficacy ( $\beta = 1.19, p < .01$ ) and gender ( $\beta = 4.38, p < .05$ ) showed a positive and significant proportion of variance in academic achievement. While the students in this sample apparently tended to find perceived value in academic success, this variable was not a significant predictor of achievement in an EMI setting.

**TABLE 2**  
Regression Analyses for Variables Predicting Academic Achievement

	All (Model A)		Male (Model B)		Female (Model C)	
	$\beta$	<i>SE</i>	$\beta$	<i>SE</i>	$\beta$	<i>SE</i>
Constant	64.07***	7.24	67.76***	8.21	64.42***	15.93
Efficacy	1.19**	0.41	0.69	0.54	1.75*	0.71
Perceived value	0.54	0.51	0.83	0.58	0.27	1.08
Class	2.83	1.90	1.27	2.46	3.69	3.30
Gender	4.38*	1.94				
$R^2$		0.31		0.24		0.38
Adj. $R^2$		0.27		0.18		0.29
<i>n</i>		65		39		26

Note.  $\beta$  = standardized beta coefficient;  $SE$  = standard error;  $R^2$  = R-squared; adj.  $R^2$  = adjusted R-squared;  $n$  = number of participants \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$

Two additional regression analyses were performed to further investigate the differences between male and female participants. Models B and C showed that after controlling for classes, student responses about perceived value were not a significant predictor of achievement. The analysis of the unstandardized parameters showed that perceived self-efficacy had, as expected, a positive and significant effect on academic achievement for female participants ( $\beta = 1.75, p < .05$ , Model C), but it was not significant for male participants ( $\beta = 0.69, p = .209$ , Model B). In Model B, goodness-of-fit statistics indicated that perceived efficacy and perceived value explained 24% of the variance in students' academic achievement. In Model C, 38% of the variance was attributed to students'

academic achievement. While the R-squared is somewhat low, it is still possible to draw a meaningful insight from the regression analyses (Agresti & Finaly, 2009) on how changes in the perceived self-efficacy and values are associated with changes in the participants' academic achievement. Overall, these results suggest that a significant percentage of variance in academic achievement was explained by students' non-cognitive factors.

## V. DISCUSSION

The purpose of this research was to investigate the relationship between motivation and learner achievement, with a special focus on gender, in an EMI context. Motivation was operationalized according to the expectancy-perceived value framework to focus on two variables: perceived self-efficacy and perceived value. We addressed the following research questions: 1) To what extent do students' evaluations of (a) their perceived self-efficacy in a class and (b) the perceived value of that class affect their academic achievement? 2) Are there consistent differences in how males and females make these assessments?

To answer the first research question, the authors conducted correlation, which revealed that achievement was positively related to both perceived self-efficacy and perceived value. Overall, those who believed that they were capable of doing well in the course and those who considered the course valuable performed better academically. To answer the second research question, the authors administered regression analyses, which further showed that only self-efficacy was predictable among female learners' achievement in the EMI courses.

Our results extend the previous findings on the importance of perceived self-efficacy and perceived value in L2 learning to the specific context of EMI. The higher a participant believed he or she would be successful in an EMI course, the higher final grade he or she achieved. The higher a participant perceived the perceived value of an EMI course, the better he or she performed in it. In short, the current study's findings confirm that perceived self-efficacy and perceived value are significant cognitive variables in the EMI context, just as they seem to be in language learning in general.

More importantly, this study provides further evidence that perceived self-efficacy is a robust cognitive variable that has a positive relationship with learner academic performance, regardless of context, learner-variables, or research methods (Hsieh & H. Kang, 2007; Mills et al., 2007). For example, this positive relationship between self-efficacy and academic performance was evident in Mills et al.'s (2007) study, which was conducted in a general education context, Hsieh and H. Kang's (2010) study, which was conducted in a foreign language education context, and now the current study, which took place in an EMI context. These studies have also shown that learner-variables such as age, majors, and gender do not affect this positive relationship. Moreover, these studies used dif-

ferent research methods. The perceived self-efficacy items in Mills et al.'s (2007) study mostly measured participants' confidence or emotions about their performance on five items using a seven-choice Likert scale, while Hsieh and H. Kang's (2010) study only had one item which asked participants what grade they expected to get on their next language exam. The current study measured participants' perceived self-efficacy regarding their good performance in class on three items using a seven-choice Likert scale.

It might be argued that the fact that the participants decided to take the EMI course, which was not mandatory for their degree, led to a participant sample that comprised mostly confident students. However, if that was the case, the statistical analysis should have shown an equally positive relationship between perceived self-efficacy and the performance of both genders.

In addition, the authors found that a student's perceived value was weakly but positively correlated with his or her grade for the course. However, the regression analysis did not show that perceived value of a task/course was a significant predictor of achievement. For both female and male students, the predicted perceived value was also not statistically significant after holding all other variables constant. A possible explanation for this may be related to the theoretical explanation of the variable. Learners' perceived value has more to do with their selection of a course or task (Eccles, 1983). Although the course was an elective, the participants might have selected the course not because they perceived it to be valuable, but because of other reasons—perhaps an advisor or friend strongly recommended taking it. Perceiving and evaluating the perceived value of a course requires active metacognitive involvement, to which could be a task that these students might not have been accustomed. In other words, it is possible that some students did not critically evaluate the perceived value of the course they enrolled in.

## VI. CONCLUSION

While it is widely known that universities in non-English speaking countries are proactively implementing EMI, minimal information is available about the ways that individual students' motivation influences their achievement in EMI contexts. The present study examined two motivational subconstructs to better understand how they affected achievement in an EMI classroom. The present study found that self-efficacy—the belief that one can be successful at a given task—was a strong predictor of achievement for female students.

The current study shows positive and robust relationship between learners' perceived self-efficacy of EMI courses and their academic achievement. Further regression analyses showed that the effect was more prominent among female learners than male learners in the EMI contexts. The findings of this study provide strong rationale to provide learners with opportunities to enhance their self-efficacy of EMI courses. For instance, in the

beginning of the course, male students should have opportunities to explicitly note their self-efficacy in a beginning of the semester survey, which they should be encouraged to revisit to remind themselves before or after any major assignments or assessments are administered.

There are several directions to consider for future research. First, with the exception of the academic achievement data, the instruments employed here were self-reported surveys. Future studies might consider additional measures, such as extensive or a focus-group interview or classroom observations. That is, interview data may draw highly congruent findings with data obtained through a self-reported questionnaire. Second, while the range of items exhibited good discrimination and internal reliability, future work in EMI contexts would seem to require additional relevant items for each construct. Third, even though there was a significant beta coefficient p-value and no multicollinearity, a test statistic for goodness-of-fit displayed a low R-squared in the proposed model. While there is no hard and fast rule that states how large an R-squared must be for a model to be regarded as a “good” one, future researchers should explore additional predictors that could account for the unexplained variance in the model. Next, the study was limited in that no data was available on participants’ English proficiency level or their previous experiences with EMI learning. While research showed that learners’ English proficiency does not have statistical relationship between learners’ perceived satisfaction of EMI (I. Kym & M. Kym, 2014), this limitation should be addressed in future research by collecting additional background information of students on their English proficiency score and could contextualize the participants in more detail. Finally, the study only examined college students, and thus the conclusions we can draw about “students” in general are limited. It would be interesting to examine the effects of motivation on different age groups as EMI expands to the younger grades as well.

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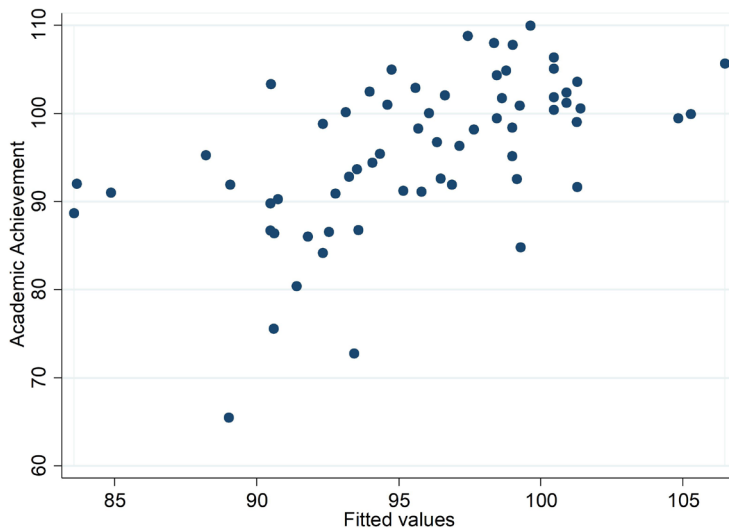
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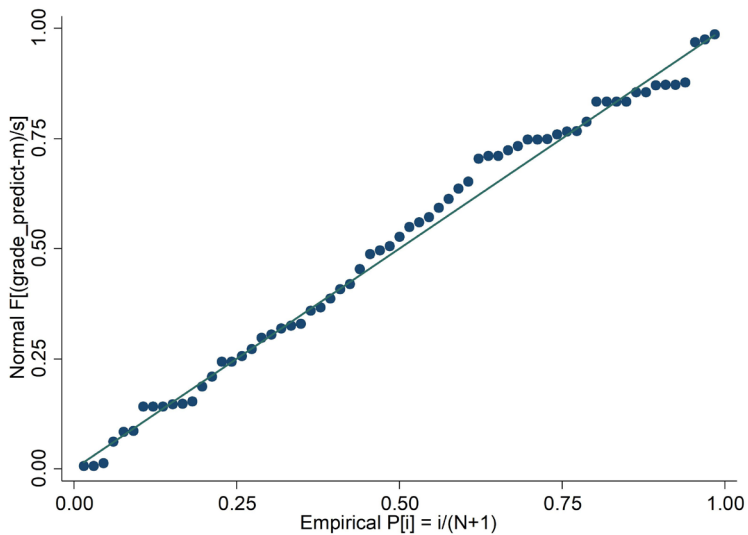


### APPENDIX 2 Testing Linearity of the Study Model



There seems to be a linear relationship between an observed and predicted achievement score.

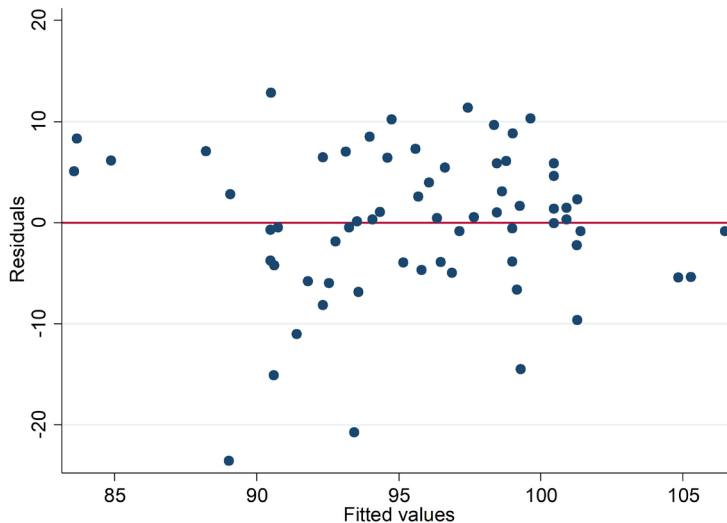
### APPENDIX 3 Testing for Normality



A P-P plot tests for nonnormality in the data. Here, in this case, the distribution appears normal.

**APPENDIX 4**

Testing for Homoskedasticity



The variance in the residuals show some symmetry, therefore, we do not suspect any heteroskedasticity.

**APPENDIX 5**

Testing for Multicollinearity

	VIF	1/VIF
Academic Achievement	1.74	0.58
Perceived Value	1.71	0.59
Self-efficacy	1.04	0.96
Class	1.01	0.99
Mean VIF	1.37	

*Note.* Another important assumption or regression model is that variables are not multicollinear. The above test check for multicollinearity. Neither variance inflation factor (VIF) nor 1/VIF values indicate multicollinearity.