



Effect of Academic Self-Efficacy on Academic Achievement of Online Foreign Language Learning: A Preliminary Cross-Sectional Study in Japanese Higher Education Environment

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Abstract

*A number of earlier studies have reported that self-efficacy and academic achievement are correlated. However, although many self-efficacy scales exist, the correlation between academic achievement and such self-efficacy scales has not been tested so far. In particular, there are only a few studies on the relation between academic achievement of foreign language learning with information, communication, and technology (ICT) and self-efficacy scales. The present study examines whether general and academic self-efficacy scales differ from each other in correlating academic achievement of foreign language learning with ICT in a higher education environment. General and academic self-efficacy scales were measured for 279 Japanese college students. Their test scores (sentence production and vocabulary) of foreign language learning courses in which Moodle was used were also obtained. First, these correlations were analyzed. Then, if a correlation of the test scores with either general self-efficacy or academic self-efficacy was found, the relation was tested for a significant correlation pattern. Academic self-efficacy statistically correlated with both sentence test and vocabulary test scores. In contrast, general self-efficacy correlated with neither of the test scores. No significant interaction was noted between general self-efficacy*academic self-efficacy for both sentence test and vocabulary test scores. Although there is no statistical interaction between general self-efficacy and academic self-efficacy correlating with academic achievement of foreign language learning with ICT, academic self-efficacy is more likely to explain academic achievement in foreign language education in a college setting with ICT than general self-efficacy. This also implies that academic self-efficacy can be more effectively applicable than general self-efficacy to foreign language learning among Japanese college students.*

Keywords: *self-efficacy, foreign language learning, academic achievement, e-learning, ICT, higher education;*

1. Introduction

Educational psychology assumes that self-efficacy is one of the key factors in learning. Self-efficacy refers to one's belief in his/her own ability to meet challenges and successfully accomplish a task [1-3]. Hence, self-efficacy relates to learners' motivation based on their belief or desire in their own capacity to grow, achieve, and develop.

Several studies have found that self-efficacy positively correlates with academic achievement [4-6]. Majority have reported that learners with higher self-efficacy demonstrate higher academic achievement. Recent studies have clarified that the relation between self-efficacy and academic achievement can be longitudinally reasoned to the enhancement of self-efficacy [7].

However, there is no clarity on the effects of self-efficacy on online learners' academic achievement. The development of information, communication, and technology (ICT) has led to the rampant use of online learning methods in education and learning in various environments such as primary, secondary, and high schools as well as higher education.

There are many common features in lecture-based education and online education, albeit with a few differences. For example, in an online learning environment, learners may pay attention not to the explanation but to a task because they complete the task mainly through quiz-based contents, which is different from a general/lecture-based learning environment like attending a class.

Several empirical studies have investigated the relation between self-efficacy and academic achievement in online learning environment, and a meta-analysis has also been published [8]. However, generalization of the results or trends is unknown. For example, Broadbent and Poon (2017) [8] did not include any studies from Japan. There is vast variation in foreign language educational environment and learners' characteristics [9-10], and even more distinctive in Japan, owing to the cultural characteristics that vastly differ from other countries. Therefore, for an in-depth understanding



of the relation between learners' self-efficacy in an online learning context and academic achievement, the present study investigates whether self-efficacy is correlated with academic achievement in the context of online learning of a foreign language in Japanese college students.

As a result, the present study tests whether the academic self-efficacy scale developed in the United States [11] is applicable to Japanese college students by comparing the general self-efficacy scale [12]. While several earlier studies have reported that academic self-efficacy was correlated with academic performance [4-6], a few studies have shown that there was a significant correlation between general self-efficacy and academic performance [13-14]. If this academic self-efficacy scale can be generalized to all learners across countries or cultures, the present study should demonstrate more applicability of the academic self-efficacy scale than the general self-efficacy scale even in the online learning environment, as the academic self-efficacy scale is more attuned to academic achievement than the general self-efficacy scale is.

2. Methods

Self-efficacy scales and test scores (sentence production test and vocabulary test) of foreign language learning courses were collected from 279 Japanese college students (124 males and 155 females aged 19–31 years, with average age of 20.26 years). Moodle, an open source learning platform that students used for taking the English learning course, was used to collect these data. The students were assigned to one of several classes, but the same textbook and course materials were used for all. The course schedule was also identical. They had to take a mini-test for each class, and there were two types of tests: sentence comprehension and vocabulary. In the present study, MLSQ [11] was used as the academic self-efficacy scale, and general self-efficacy [12] was used a general self-efficacy scale. The course duration was 15 weeks, one class per week. The students could freely undertake the practice contents but finish the tasks in the stipulated time (i.e., the end of the 15th week). All the participants were informed about the method and deadline in the first lecture.

Simple data analyses were carried out to find the correlations. If either general self-efficacy or academic self-efficacy was correlated with the test scores, their interaction was tested by using the generalized linear model to determine whether a significant correlation pattern existed. These two factors were also tested to confirm whether age and gender affect these correlation results.

3. Results

Table 1 shows the characteristics of the data. The correlation analysis was run to test the influence of age and gender on academic performance. Non-parametric correlation was used because of non-normal distribution in academic performances. Table 2 shows these results. Since there was a statistical correlation between academic self-efficacy and academic performance but not between general self-efficacy and academic performance, the interaction was tested by using generalized linear modeling. Academic self-efficacy statistically correlated with both sentence test (Wald chi-squared test = 5.6, $p < 0.017$) and vocabulary test scores (Wald chi-squared test = 8.66, $p < 0.003$). In contrast, general self-efficacy correlated with neither sentence test (Wald chi-squared test = 0.89, $p = 0.34$) nor vocabulary test scores (Wald chi-squared test = 1.64, $p = 0.19$). However, there was no significant interaction between general self-efficacy*academic self-efficacy on academic achievements (sentence test: $p = 0.17$, vocabulary test: $p = 0.08$). This indicates that there is no statistically significant difference between general self-efficacy and academic self-efficacy in terms of the explanation of academic achievements.

4. Discussion and conclusion

Only academic self-efficacy correlated with academic performance of both sentence and vocabulary tests, and no statistical significance was shown in the correlation between general self-efficacy and the academic performances. With regard to the relation between academic self-efficacy and academic achievements, the study results agree with majority of the earlier findings [4-6]. However, in the generalized linear model, there was no significant interaction between general self-efficacy*academic self-efficacy on academic achievements.

Considered together, these results imply that while there is no significant difference, academic self-efficacy is more likely to explain academic achievements in college foreign language education setting with ICT than general self-efficacy and that academic self-efficacy can be more effectively applicable even to foreign language learning among Japanese college students than general self-efficacy. This implies that academic self-efficacy scale originally developed in United States may be generalized across all countries or cultures. To fully understand the importance or role of self-efficacy



on academic achievements, future studies need to test the applicability through experiments conducted in various countries and cultures.

Table 1. Data of general self-efficacy, academic self-efficacy, academic performances, age, and gender.

	Mean	SD	Min	Max	Male mean	Female mean
Sentence test scores	71.3	18.4	20	100	68.3	77.2
Vocabulary test scores	65.6	21.7	8	99	65.4	71.5
general self-efficacy	2.73	0.55	1	4	2.78	2.63
academic self-efficacy	2.50	0.33	1	3	2.51	2.45
age	20.2	1.15	19	31	20.2	20.1

Table 2. Results of correlations among general self-efficacy, academic self-efficacy, academic performances, age, and gender.

	1	2	3	4	5	6
1. sentence test	1					
2. vocabulary test	0.79**	1				
3. general self-efficacy	0.29	0.05	1			
4. academic self-efficacy	0.18**	0.20**	0.60**	1		
5. age	0.65	0.05	0.03	0.02	1	
6. gender (male=1, female=0)	-0.21**	-0.18**	0.15*	0.08	0.10	1

** $p < 0.01$, * $p < 0.05$

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