Self-Efficacy, E-Learning and Online EFL Proficiency Test

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Abstract
Previous studies have reported that self-efficacy plays an important role as a predictor of learners' motivation and learning. This study focused on general self-efficacy, which is the belief in one's competence to cope with a broad range of stressful or challenging demands, in language learning. Relations between general self-efficacy and EFL (English as a Foreign Language) learners' performance in e-learning and their scores on online English proficiency tests were examined. Participants of this study were 60 EFL university students in Japan aged between 18 and 21. Their perceived self-efficacy was assessed using Japanese Adaptation of the General Self-Efficacy Scale (Ito, Schwarzer, & Jerusalem, 2005). All students studied with e-learning courses (Net Academy 2, developed by ALC) in class and out of class. They also took two types of online English proficiency tests: TOEIC Practice Test developed by ALC Press, Inc. and CASEC developed by the Society for Teaching English Proficiency, Inc. Statistical analyses such as t-tests, factor analyses, and Pearson's correlation tests were conducted. Results show that advanced EFL learners with higher general self-efficacy scored higher on the online tests. The results also revealed that intermediate students with higher self-efficacy to come through difficulties performed better in online vocabulary training. It is therefore implied that self-efficacy seems to be a universal construct that yields meaningful relations with Japanese EFL learners' performance on e-learning and online tests.

Keywords: self-efficacy, e-learning, online testing, EFL learners

1. Introduction

1.1 Self-efficacy

The focus of this study is self-efficacy. Self-efficacy is defined as "beliefs in one's capabilities to organize and execute courses of action required to manage prospective situations" (Bandura, 1995, p.2). Put simply, it is a person's "I can" or "I cannot" beliefs. Unlike self-esteem, which reflects how people feel about their worth, self-efficacy reflects how confident they are about performing specific tasks. It should be noted that high self-efficacy in one area may not coincide with high self-efficacy in another area. Bandura (ibid. p. 2) suggests that self-efficacy beliefs influence how people think, feel, motivate themselves, and act.

According to Bandura (1994), people's self-efficacy beliefs can be developed by four main sources of influence. These are mastery experiences (performance accomplishments), vicarious experiences provided by social models, social persuasions and physiological factors. Firstly, mastery experience is assumed to be most influential among them. He suggests that successes build a robust belief in one's personal efficacy while failures undermine it. Secondly, various experiences provided by social models, such as seeing people similar to oneself succeed by continuous effort raises observers' beliefs that they too possess the capabilities to master comparable activities required to succeed. On the other hand, observing others' fail despite high effort lowers observers' judgments of their own efficacy and undermines their efforts. Thirdly, self-efficacy is also influenced by social persuasions such as encouragement and discouragement from others. People who are persuaded verbally that they can master given activities tend to make great effort and sustain it. People who have been negatively persuaded, however, tend to harbor self-doubts and avoid challenging activities and trying hard to succeed. Fourthly, physiological factors, such as anxiety, agitation, fatigue, and pain are also influential. People tend to interpret their stress reactions and tension as signs of sensitivity to poor performance.

According to Pajares (1997), self-efficacy have been found related to clinical problems such as phobias, addiction, depression, social skills, assertiveness; to stress in a variety of contexts; to smoking behavior; to pain control; to health; and to athletic performance. It has also received increasing attention in educational research. Researchers in this area have reported that students' self-efficacy beliefs are correlated with their academic performances and achievement (e.g., Bong & Skaalvid, 2003). It is also suggested that self-efficacy beliefs are correlated with other motivational constructs such as goal setting, problem solving, test and domain-specific anxiety, self-regulation, social comparisons, and strategy training. However, much uncertainty still exists about self-efficacy in second/foreign language learning.

Self-efficacy is usually considered task specific. Some researchers, however, have conceptualized a generalized sense of self-efficacy that refers to a broad and stable sense of personal competence to deal effectively with a variety of stressful circumstances (Schwarzer & Jerusalem, 1995). General self-efficacy (GSE) reflects a generalized belief that we will be successful at whatever challenges or tasks we might face. GSE may explain a broader range of human behaviors and coping outcomes when the context is less specific (Luszczynska et. al., 2005).

1.2 E-Learning

In this article, e-learning is defined as learning that is supported by information and communication technology (ICT). ICT has the capacity to improve traditional teaching methods, enrich students' learning experience, and increase the potential impact of learning on performance (Pedro, 2005). E-learning has a significant role in teaching and learning languages at universities across the world. E-learning offers new and alternative ways of teaching and learning. Most universities in Japan now offer classes that use e-learning in some form as an enhancement to face-to-face teaching. Note that e-learning is also called web-based learning, online learning, computer-assisted learning, or Internet-based learning.

1.3 Computer Based Online Testing

Over the years the role of computers in language testing has also been enhanced. Computers have been used to automate scoring, to administer tests, to generate descriptive and interpretative reports of test results, and to take tests. The use of computer-based testing is increasing rapidly. Computer-based testing usually utilize the internet, and thus, it is also called online testing, network-based testing, Internet-based testing, or web-based testing. The use of internet in testing provides test takers with opportunities to self-assess and practice test taking as well.

2. Purpose of the Study

The literature review suggests that self-efficacy is a significant predictor of academic success across subject areas, culture, and gender. This paper will focus on Japanese EFL learners' general self-efficacy (GSE), their use of E-learning and their scores on online English proficiency tests. The purposes of this study are three folds: (1) to assess Japanese EFL university students' GSE, (2) to describe patterns of their reported GSE, and (3) compare the reported GSE, E-learning use, and English proficiency.

3. Method

3.1. Participants

A total of 60 undergraduate students participated in this study. Six students were omitted from the analyses due to missing data of some sort. The sample consisted of 41 male and 13 female students. Based on the results of the placement test which will be described in section 3.4, the students were placed into two different levels of English courses. Their age ranged from 18 to 21 years. The students did not receive any compensation for participating in the study.

3.2. Questionnaire

The GSE scale used in this study includes 10 items. It was originally devised in German and subsequently adapted to 28 languages (Schwarzer & Jerusalem, 1995). The present study used Japanese Adaptation of the General Self-Efficacy Scale (Ito, Schwarzer, & Jerusalem, 2005). Assessment of GSE is usually conducted with four-point Likert-type scale. The assessment in this study however, used a seven point

Likert-type scale to ask respondents for the level of agreement in order to increase reliability of statistical analysis of its results. The respondents were asked to read each item and then to indicate a response ranging from *I never think so* (1) to *I often think so* (7). All the items and response options are written in Japanese to avoid any problems Japanese EFL learners could encounter understanding the items and response options. The participants completed the questionnaire in class in 10 minutes under the supervision of the regular class instructor.

3.3. E-learning Courses

The e-learning courses examined in the present study, Net Academy 2, were made accessible to all the undergraduate students throughout the day. The courses of Net Academy 2 examined in this study were 1) vocabulary, 2) grammar, 3) listening, 4) reading, and 5) dictation training.

The participants studied with the training courses in class and out of class. The e-learning system made it possible for the students to practice their English skills at their own pace, to self-assess their language skills, monitor and evaluate their performances on each course, and regulate their learning. The system also enabled instructors to examine and manage students' learning.

3.4. Online English Proficiency Tests

The participants took two types of online English proficiency tests. One is a TOEIC (R) Practice Test developed by ALC Press, Inc. TOEIC is a registered trademark of Educational Testing Service (ETS). Questions of the TOEIC Practice Test used in this study were provided by ALC and not approved by ETS. The practice test has two sections: Listening and Reading.

The other online test is CASEC (Computerized Assessment System for English Communication) developed by the Society for Teaching English Proficiency, Inc (STEP). In 2000, The Japan Institute for Educational Management, Inc. (JIEM) became independent from STEP and took over the development and management of CASEC. Currently, CASEC is one of the largest computerized adaptive test in Japan. The CASEC consists of a total of 55 items divided into four sections . The four sections assess 1) vocabulary knowledge, 2) knowledge of phrasal expressions and usage, 3) listening proficiency to understand the main idea, and 4) listening proficiency to understand specific information.

The tests were given during class time. All participants test results were saved digitally online and are accessible anytime, anywhere and from any device to the participants and their instructors. Note that all participants took CASEC as a placement test at least three times, in April, July, January, of the first year. Note that new academic year starts in April in Japan. Many students took more than four times because they were entitled to take CASEC without a fee once a week.

3.5. Data Analysis

Data analysis was conducted with respect to the objectives set for this study. IBM SPSS Statistics version 21.0 was used for descriptive statistics, Cronbach's alpha coefficients, factor analyses, t-tests, and Pearson correlations. Data used in this study were the students' responses on the 10-item questionnaire, their study records on the e-learning courses, and their scores of the online tests.

4. Results and Discussion

4.1 Results of Descriptive Analyses

4.1.1 Gender Effects

To examine and describe Japanese EFL university students' GSE, descriptive analysis was conducted. The results stratified by gender are summarized in Table 1. Regarding male students, Item 2 yielded the highest mean (5.02), while Item 5 the lowest (3.51). Regarding female students, Item 6 and 8 yielded the highest mean (4.23), while Item 5 the lowest (2.92). Interestingly, both males and females had the lowest mean scores for Item 5, *Thanks to my resourcefulness, I know how to handle unforeseen situations*. These results are consistent with data described in Scholz et al. (2002). The comparison with other nations' GSE (ibid, 244-245), however, reveals that this tendency is not universal at all and possibly specific to Japanese.

Why did the Japanese students report to have low self-efficacy in their resourcefulness? One reason why Item 5 yielded the lowest mean scores is that the Japanese version of Item 5 (Ito, Schwarzer, & Jerusalem, 2005) contains praises. The phrase "thanks to my resourcefulness" was translated as "*watashi wa sairyaku ni taketeiru node*" which means "since I have excellent wisdom and tactics." The phrase "*sairyaku ni takeru*" is usually used for others to praise them, and hardly used for yourself. If it is used for yourself, it sounds like either a joke or self-praise which is usually avoided in Japanese society. As pointed out in Davies & Ikeno (2002), modesty or humility is one of the most important aspects of proper behavior in Japan, and self-assertiveness is more or less discouraged. It can therefore be assumed that the many Japanese respondents to GSE scale avoided answering "I often/sometimes/occasionally think so" to Japanese version of Item 5 because it sounded like self-praise.

Table 1
Japanese EFL learners' GSE Mean Scores Stratified by Gender

GSE Items	Gender	M	SD
1. I can always manage to solve difficult problems if I try hard enough.	M	4.54	1.72
	F	4.08	1.12
2. If someone opposes me, I can find the means and ways to get what I want.	M	5.02*	1.56
	F	4.00*	1.15
3. It is easy for me to stick to my aims and accomplish my goals.	M	4.20	1.56
	F	3.31	1.11
4. I am confident that I could deal efficiently with unexpected events.	M	3.88	1.66
	F	3.46	1.45
5. Thanks to my resourcefulness, I know how to handle unforeseen situations.	M	3.51	1.57
	F	2.92	1.26
6. I can solve most problems if I invest the necessary effort.	M	4.66	1.51
	F	4.23	1.48
7. I can remain calm when facing difficulties because I can rely on my coping abilities.	M	3.95	1.61
	F	3.38	1.45
8. When I am confronted with a problem, I can usually find several solutions.	M	4.32	1.51
	F	4.23	1.42
9. If I am in trouble, I can usually think of a solution.	M	3.93	1.35
	F	3.62	0.87
10. I can usually handle whatever comes my way.	M	3.88	1.40
	F	3.77	0.93

*Statistically significant difference ($p < .05$) between males and females.

Another point to note is that Japanese men reported to have slightly stronger GSE than Japanese women. Regarding all the 10 efficacy items, male students scored higher than female students. The overall GSE mean score for the male students (4.19) was higher than that for female students (3.70). Independent-samples t-tests revealed that only Item 2 showed a statistically significant difference by gender ($t(52)=2.18$, $p= .034$). Item 2 says *if someone opposes me, I can find the means and ways to get what I want*; thus, it is assumed that those who chose higher response options for Item 2 had greater fortitude and did not hesitate to show it. In other words, Japanese men reported to have greater fortitude than Japanese females did.

4.1.2 Proficiency Effect

Figure 1. shows the results of the effect of proficiency on Japanese GSE scores. Advanced learners scored higher on Item 4,6,8. Independent-samples t-tests revealed no significant difference. The largest difference between advanced (4.03) and intermediate (3.48) learners were found on Item 4 which says *I am confident that I could deal efficiently with unexpected events*.

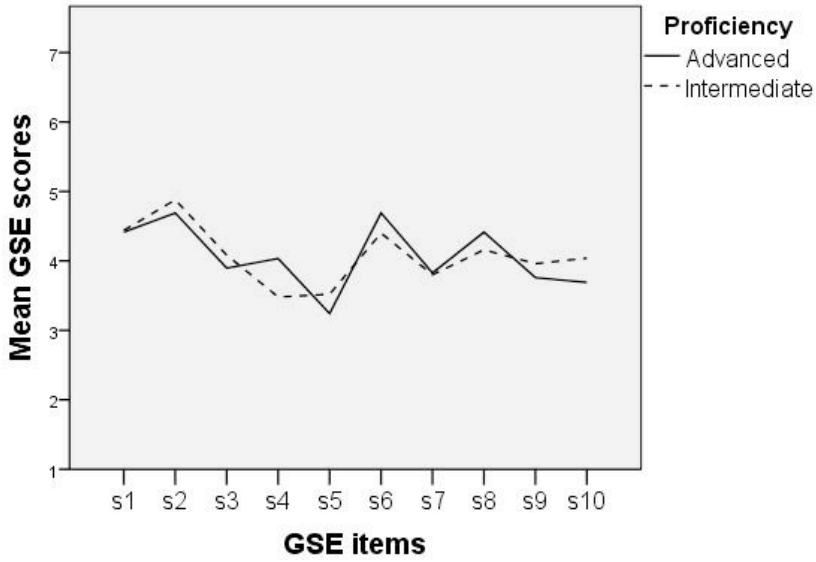

Figure 1: Japanese EFL learners' GSE Mean Scores Stratified by Proficiency

4.2 Results of Factor Analysis

In factor analysis common factors are shown to be responsible for the covariation among a set of measured variables. To extract common factors possibly affecting Japanese EFL learners' perceived GSE, exploratory factor analyses were conducted on the responses to the GSE questionnaire survey. It should be noted that, before the first analysis, normality for the responses for each item was tested by examining each histogram. As a result, no items showed floor or ceiling effect; thus, all items were examined in the following analyses.

For the first factor analysis, the principle factor method was used without rotation because the sample size in this study was small and thus the method seemed to maximize interpretation compared to the results of other methods. In this analysis, 2 factors having an eigen value greater than one were retained. Therefore, the second analysis was conducted requesting two factors. The Cronbach's coefficient alpha for each factor was .89 and .66 respectively. The principle factor method with Varimax rotation was used.

Factor 1 has a subset of seven GSE items with high loadings (Item 7, 10, 5, 4, 8, 9, 6) as shown in Table 2. The rotated factor loadings, which represent both how the items are weighted for each factor and the correlation between the items and the factor, are also shown in Table 2. As the table shows, all the seven items imply confidence to come through a difficulty (s)he might face. Therefore, Factor 1 was labeled Confidence *to come through difficulties.*

Table 2 also shows the items which highly loaded on Factor 2. The point to observe is that Item 3 with the highest loading (.731) and Item 2 with the second highest loading (.563) imply confidence to reach a goal, and that the items which highly loaded on Factor 1 do not contain words related to a goal and achievement. Therefore, Factor 2 was labeled *Confidence to achieve goals*.

Table 2
The Factors extracted and their Rotated Factor Loadings

Factor 1: **Confidence to come through difficulties**	*1*	*2*
7. I can remain calm when facing difficulties because I can rely on my coping abilities.	.807	.062
10. I can usually handle whatever comes my way.	.747	.228
5. Thanks to my resourcefulness, I know how to handle unforeseen situations.	.696	.416
4. I am confident that I could deal efficiently with unexpected events.	.679	.314
8. When I am confronted with a problem, I can usually find several solutions.	.675	.400
9. If I am in trouble, I can usually think of a solution.	.649	.210
6. I can solve most problems if I invest the necessary effort.	.526	.376
Factor 2: **Confidence to achieve goals**	*1*	*2*
3. It is easy for me to stick to my aims and accomplish my goals.	.079	.731
2. If someone opposes me, I can find the means and ways to get what I want.	.245	.563
1. I can always manage to solve difficult problems if I try hard enough.	.341	.518

4.3 General Self-Efficacy, E-Learning, and Online Tests

The relationships between the factors shown in Table 2 and the students' performances on e-learning courses and online tests were examined using Pearson's correlation tests. The results are summarized in Table 3. The variables in e-learning showing no significant relationships, such as grammar, listening, reading, and dictation training courses, were removed from the table to make it easy to read.

Table 3
Results of Pearson's Correlation Tests Stratified by Proficiency

		Variables					
Proficiency	Factors	V	TL	TR	C1	C2	C3
Advanced	Factor 1	.142	.100	.284	.370*	.182	.260
	Factor 2	-.095	.402*	-.038	.093	.073	.133
Intermediate	Factor 1	.464 *	.264	-.192	-.423*	.086	-.155
	Factor 2	-.094	.441	-.330	.042	-.430*	-.353

*Significant at $p < 0.05$.
V= vocabulary training; TL=TOEIC listening; TR=TOEIC reading; C1=1st CASEC; C2=2nd CASEC; C3=3rd CASEC.

Regarding the advanced learners, Factor 1 *Confidence to come through difficulties* has a positive relationship with the first CASEC scores, and Factor 2 *Confidence to achieve goals* has a positive correlation with TOEIC listening practice test scores. Regarding the intermediate learners, a positive relationship was found only between Factor 1 and the performance on online vocabulary training course.

Surprisingly, the first and second CASEC test scores of the intermediate learners are negatively correlated with Factor 1 or Factor 2.

The mild positive correlation between Factor 1 and the first CASEC scores found with advanced students may help us understand how the EFL learners felt and acted when they took the CASEC test for the first time. As described above, Factor 1 has to do with *confidence to come through difficulties*. Therefore, the correlation suggests that those who selected higher response options to the GSE items concerning confidence to come through difficulties performed better at the first CASEC test which was taken place at the beginning of the first year at university. The second or the third CASEC test scores, however, showed no correlation to Factor 1 or Factor 2. It is possible, therefore, that the first CASEC test was a "difficulty" or an "unexpected event" to the EFL university students in this study. It was probably the first computer-assisted online English test to take in their lives. By the time of the second and third CASEC tests, however, the students enriched their experience and became skilled in computer use, computer-assisted learning, and online tests. This combination of findings indicates that self-efficacy to handle difficulties or unexpected situations is partly responsible for determining how well a person can perform on unfamiliar tasks in their academic career.

Another point to note is that GSE affected advanced and intermediate learners differently in terms of online test scores. Regarding the intermediate learners, Factor 1 and Factor 2 showed strong negative correlations with the CASEC test scores. In other words, those intermediate learners with high GSE scored lower on the online tests. These results may be due to a small sample size in this study. Or, they suggest that GSE can predict academic performance and achievement only when the subjects are advanced students. Or, this inconsistency may imply that GSE beliefs are unlikely to determine most aspects of our academic career. This question remains unanswered at present.

If we now turn to the relationship between GSE and e-learning, it is noteworthy that the intermediate students who reported to have confidence to come through difficulties worked harder and gained more points on online vocabulary training. It is therefore likely that such relationship exist between self-efficacy to get over difficulties and performance on a certain type of e-learning.

Taken together, these findings suggest the importance of self-efficacy for Japanese EFL learners in their academic career. Low self-efficacy to get over difficulties or achieve goals could have negative impact on their academic performance and achievement. These findings have important implications for teachers and classroom instructions. For instance, teachers could be advised to figure out how to give their students mastery experiences (performance accomplishments) and vicarious experiences to build up their self-efficacy. Students also need positive persuasions from their teachers to strengthen their self-efficacy. Teachers also need to pay attention to students physiological condition, especially anxiety in class, so that they could prevent their students from undermining their self-efficacy beliefs and harboring self-doubts.

5. Conclusion

The present study was designed 1) to assess Japanese EFL university students' general self-efficacy (GSE) using a questionnaire, 2) to describe the patterns of the reported GSE, and (3) to examine the relationships between the reported GSE and the students' performance on e-learning courses and online English tests. Descriptive statistics revealed the followings:

1. Japanese men and women both had the lowest mean scores on Item 5, *Thanks to my resourcefulness, I know how to handle unforeseen situations*.
2. Japanese men reported to have slightly stronger GSE than Japanese women. Men scored higher than women on all the GSE items, but the difference was not significant excluding Item 2 which says *if someone opposes me, I can find the means and ways to get what I want*.
3. Advanced learners scored higher on Item 4,6,8, but the difference was not significant. The largest difference between advanced and intermediate learners were found on Item 4 which says *I am confident that I could deal efficiently with unexpected events*.

In the factor analysis, two factors were extracted to explain the Japanese EFL learners' reported GSE:

1. Confidence to come through difficulties
2. Confidence to achieve goals

Furthermore, the investigation on the relationships between Japanese GSE and online English tests, this study demonstrated that Factor 1 had a moderate significant positive correlation with the CASEC scores, regarding advanced students. In other words, those advanced learners who reported to have higher self-efficacy to come through difficulties could gain higher scores on the CASEC test which was taken place at the beginning of the first year at university. In addition, this study demonstrated that Factor 2 *Confidence to achieve goals* had a positive correlation with the scores of the listening section in a TOEIC practice test. Interestingly, the results of this study indicated that the intermediate students were influenced by GSE in the opposite direction. The higher general self-efficacy the students had, the worse performance they provided on online tests.

The analysis on the relationships between GSE and e-learning revealed that the intermediate students who reported to have confidence to come through difficulties worked harder and gained more points on online vocabulary training. Other training courses (grammar, dictation, etc.), however, showed no significant correlations.

These findings hopefully enhance our understanding of self-efficacy. The empirical findings in this study could contribute to existing knowledge of self-efficacy in education by providing a new understanding of EFL learner's performances on e-learning and online tests in the light of self-efficacy. The present study, however, was limited by small sample size. Further work needs to be done with larger samples to examine when and how GSE affects language learners. Moreover, a future study devising a questionnaire with more task specific self-efficacy items for EFL learners would be interesting.

Considerably more work will need to be done to connect research and practice. Teachers and curriculum developers could improve the quality of education by recognizing the importance of self-efficacy beliefs as determinants of performance. Understanding the sources of self-efficacy and devising strategies to strengthen students' self-efficacy is also advantageous to teachers and curriculum developers. This would definitely be a fruitful area for further work.

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