Feasibility of Using Generic Skills Testing to Assess Language Learning Ability: Report on the 2018 Joint Research Project

ジェネリックスキルテストを使用した言語学習能力評価の実行可能性：2018 年度多摩大学共同研究プロジェクト報告

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***Abstract*:** This report explains the preliminary findings of a longitudinal study that uses statistical analyses of PROG scores and TOEIC scores to determine if the PROG might be an indicator of language learning ability. PROG scores for Literacy and Competency from 2018 for a group of university freshmen were correlated with English grades, TOEIC scores and changes in TOEIC scores over time. Additional correlations were calculated for sub-groups such as TOEIC range and gender. The preliminary findings indicate weak correlations between PROG scores and TOEIC scores. Similarly, there are weak to moderate correlations between PROG scores and final grades in English classes. More importantly, the correlation coefficients are statistically significant at less than .05 *p* value and less than .01 *p* value. Although more data analysis is necessary, the results indicate that generic skills tests can provide language educators with valuable information for both language course design and student placement into language course levels.

***Keywords*:** Generic Skills, TOEIC, PROG test, EFL, Language Learning Ability

***要旨*:** 本稿では、PROG が言語学習能力の指標であるかどうかを判断するために行った PROG スコアと TOEIC スコアの統計分析を使用した縦断的研究の予備調査結果を報告する。2018 年の大学の新入生のグループが受験した PROG のリテラシーとコンピテンシーのスコアが、英語の成績、TOEIC スコア、及び時間経過に伴う TOEIC スコアの変化と相関しているかを分析した。さらに、TOEIC スコアの分布や性別などの下位グループについても相関関係を調べた。予備調査の結果は、PROG スコアと TOEIC スコアの間に弱い相関があることを示している。同様に、PROG スコアと英語クラスの成績との間には弱から中程度の相関がみられた。より重要なことに、相関係数は .05 *p* 値未満および .01 *p* 値未満で、統計的に有意である。より多くのデータの分析が必要であるが、本研究は、ジェネリックスキルテストが語学コースの設計とコース受講者のプレースメントに役立ち、語学教育の担当者に貴重な情報を提供できる可能性を示している。

***キーワード*:** ジェネリック・スキル、TOEIC、PROG テスト、EFL、言語学習能力

1. Introduction

Two current trends in Japan are prompting universities to put greater emphasis on measuring the academic achievement of their students. The first is the growing move to increase transparency of how curriculum and faculty qualifications meet the needs of students. The second is the demographic trend of fewer students of university age available to fill available places within a classroom. The latter trend means that some universities, especially those which are smaller, less famous universities in rural or suburban areas, have to work harder to attract a sufficient number of students. Hence, increasing transparency in the form of test statistics that demonstrate academic achievement becomes one tactic to attract motivated students.

Although the Test of English for International Communication (TOEIC) has been used as one measure of academic achievement in many universities, the move toward testing students' generic skills is gaining popularity among universities in Japan. The increase in emphasis on generic skills is partially due to the fact that the latter are considered to be essential skills for making the transition from university student to productive member of the workforce in a global society. These skills include communicating, problem-solving, critical thinking, analytical reasoning, flexibility, persistence, resilience, leadership and creativity.

Currently in Japan, the Progress Report on Generic Skills (PROG) is gaining popularity as a means of measuring academic achievement. The PROG is split into two sections; Literacy, and Competency. Both sections are in Japanese only. The Literacy section is intended to measure intellectual competence. Students receive an overall score out of 7, encompassing 4 problem solving skills, and 2 processing skills, each scored out of 5. An overall score of 4 out of 7 is considered to be what is expected of a first year university student. An example of a Literacy question involves having students read a short case study and then provide suitable analysis and recommendations. The Competency section intends to measure students' communication skills in accordance with societal expectations. As with Literacy, students receive an overall score out of 7. This involves 3 sub-categories, which are further divided into 9 categories, which, in turn, encompass 33 sub-categories. A score of 4 out of 7 is considered to meet societal expectations. In the Competency section, questions are short with numerical answers that range in form from "Very much" to "Not at all". The nature of the questions is relevant to the student's personality and life experience.

The PROG test was released in 2012 and since that time has been used at nearly 300

universities in Japan (Uchida et al., 2018). Whether the PROG can be used as an indicator of academic achievement or not is a topic of heated discussion. Some studies have found weak to moderate correlations between PROG Literacy and grade point averages (Uchida et al., 2018; Ito, 2014). However, these studies did not find significant correlations between PROG Competency and grade point averages. From the results of his study, Ito (2014) recommends that PROG scores only be used as a reference and should be triangulated with other assessment techniques in order for universities to gauge the academic achievement of their students.

Although some research exists on the feasibility of using the PROG as an indicator of academic achievement, there is a paucity of research on using generic skills testing, and the PROG in particular, as a possible indicator of language learning ability. Uchida et al. (2018) included some statistical correlations of students' English class grades with PROG scores in their analysis of dental students' academic achievement. They reported correlations ranging from .25 to .43 for several English classes. These findings are in line with the initial expectations for the current study. However, the current study intends to also include correlations with the TOEIC scores and how they change over time to investigate the possibility of using PROG scores to assess language learning ability.

The PROG tests for generic skills (e.g., problem solving, conceptual thinking skills, critical thinking, general communication skills, collaboration and negation). Since these skills are central to developing language learning strategies, they are also beneficial for language learning. Therefore, students with higher PROG scores should have a predisposition, or at least an advantage, for acquiring second language communication skills. If the TOEIC and English class grades are accurate indicators of students' language ability, then we would expect to find a positive correlation between PROG scores and English class grades, as well as a positive correlation between PROG scores and differences in TOEIC scores after one semester, and then after one academic year. Therefore, the purpose of this longitudinal study is to analyze correlations between students' PROG scores and TOEIC scores in order to determine which, if any, generic skills might help to assess students' language learning ability.

There are four reasons this study is important for universities with foreign language programs. First, the results of the study could influence how universities place students into English classes or other foreign language classes. Currently, using TOEIC scores as a way of dividing students with similar proficiency into levels is common. However, students' TOEIC scores may reflect more on a student's test-taking ability than actual

language ability. Additionally, a student's TOEIC score does not reflect the student's language learning ability. If generic skills testing can provide language programs with information that will help to indicate a student's aptitude for foreign language acquisition, then the results from generic skills testing can help universities place students in language classes based not only on students' language ability, but also on their language learning aptitude. Similarly, a second reason this study is important is that the results may be able to help teachers design language courses and lessons based on the generic skills ability of students.

The third reason the study is important is that the results can provide valuable information for understanding the intricate combination of variables that either facilitate or hinder English language learning for Japanese university students. Finally, the results of the study could also contribute to longitudinal collection of a variety of data related to analyzing academic performance. These data can then be triangulated to assess academic achievement.

2. Methodology

2.1 Participants

All data were collected from a group of university freshmen attending a small liberal arts school in a suburban area in the Kanto region of Japan. The database originally included 183 first year university students that had taken both the TOEIC and the PROG at the start of the 2018 academic year. However, the number of students for the initial correlation calculations was reduced to 161 due to the fact that some students did not take the TOEIC after the first semester. After the final grades were entered, one additional student was eliminated from the data analysis due to not having taken all scheduled English classes.

A smaller group of 106 students was later selected from the larger group because all these students were taking English Reading and English Listening classes that focused specifically on preparation for the TOEIC. These students entered the university with fairly low TOEIC scores and were considered as beginners and false beginners for learning English.

2.2 Methods and procedures

As an ongoing longitudinal study, the researchers are primarily using quantitative methods to calculate and analyze correlation coefficients and useful descriptive statistics.

In addition, some qualitative research methods are being used to examine individual students' data. These qualitative methods include document analysis of students' class work and background information; action research data gathered from teachers; and, additional information gained through participant observation on the part of the researchers. After compiling an extensive database that includes students' PROG scores, TOEIC scores, grades and background information, the data were analyzed using the statistical software R. To collect the data for this preliminary report, the R statistical program was used to run statistical analyses of correlations between 1) PROG Literacy scores and changes in TOEIC scores from April to July; 2) PROG Competency scores and changes in TOEIC scores from April to July; and, 3) April PROG scores and spring semester English class grades.

The Spearman rank-difference correlation (Spearman's rho) was used instead of the Pearson formula for correlation because the PROG scores are ordinal data. The Spearman rho is the appropriate choice when computing correlation coefficients for nonparametric data (Terrell, 2012).

2.3 Limitations

Since the current results are only the first step in a longitudinal study, additional data may require reinterpretations. Furthermore, the data are being collected from a group of students from only one university, and therefore, any inferences from the results now or in the future are difficult to generalize to the larger group of first year students studying English in Japan.

Additional limitations include the reliability of the TOEIC to measure English ability and the reliability of the PROG test for measuring generic skills. The latter is an issue that has been raised by some researchers (Ito, 2014).

3. Preliminary Results

The results thus far only represent the analysis of data for the first step of this longitudinal study.

Table 1. Descriptive Statistics

	April TOEIC Scores			Change in TOEIC Score Apr – Jul			PROG	
	Listening	Reading	TOEIC	Listening	Reading	TOEIC	Literacy	Competency
n	160	160	160	160	160	160	160	160
min	30	45	100	-100	-110	-135	1	1
max	370	330	685	170	125	295	7	7
median	177.5	100	265	37.5	10	50	2	3
mean	180.81	110.22	291.03	39.31	13.38	52.69	2.78	3.13
std.dev	63.93	44.82	98.52	42.18	35.05	57.94	1.51	1.48

Table 1 shows the descriptive statistics for all students. The first three columns show the TOEIC scores in April for Listening, Reading, and the total scores. The next three columns show the change in scores between April and July. The final two columns show the Literacy and Competency scores of the PROG test. The means are 2.8 and 3.1, respectively, which are both lower than the score of 4 which is expected of first year university students.

Table 2. PROG Literacy Sub-groups' Average TOEIC Changes

PROG Literacy	Number of Students	TOEIC Listening July 2018	TOEIC Reading July 2018	TOEIC Total July 2018	TOEIC Listening Difference April – July	TOEIC Reading Difference April – July	TOEIC Total Difference April – July
5-7	25	248	166	414	38	29	67
4	24	207	102	309	56	5	61
3	30	228	120	349	50	18	68
2	44	220	126	346	32	13	45
1	38	205	109	314	31	4	34

Table 2 groups students by their PROG Literacy scores. It is clear that students with Literacy scores of 1 and 2 had smaller increases in TOEIC scores after one semester on average. Students with either 3 or 4 on the PROG Literacy had, on average, increases comparable to the students who scored between 5 and 7. This could be partially attributed to the fact that they entered the university with lower TOEIC scores and in theory it is easier to marginally raise a basic TOEIC score than intermediate TOEIC score in one semester. Furthermore, since the students with either 3 or 4 on the PROG Literacy did relatively better at increasing their scores than the students who scored 1 or 2 on the PROG Literacy, these figures support the possibility that PROG Literacy scores could provide some indication of students' language learning ability.

Table 3. PROG Competency Sub-groups' Average TOEIC Changes

PROG Competency	Number of Students	TOEIC Listening July 2018	TOEIC Reading July 2018	TOEIC Total July 2018	TOEIC Listening Difference April - July	TOEIC Reading Difference April - July	TOEIC Total Difference April – July
5-7	26	219	134	353	29	28	57
4	39	227	137	363	38	19	57
3	37	221	123	344	35	11	45
2	32	222	117	339	43	6	49
1	27	210	103	312	54	3	57

Table 3 is similar to Table 2; however, students are grouped based on their PROG Competency scores. The difference in total TOEIC scores varies much less than for the PROG Literacy groups. The difference is more obvious for changes in TOEIC Reading scores. These data could indicate that students with higher PROG Competency scores may have greater aptitude for increasing their TOEIC Reading scores. However, the average increase in TOEIC Reading scores is minimal and therefore should be considered as only weak evidence to indicate any positive correlations between PROG Competency and TOEIC Reading score changes over time. Further research is needed to investigate this relationship.

Table 4. TOEIC Listening Difference and PROG Correlations

		All Scores (n = 160)	TOEIC Under 310 (n = 106)
Literacy		0.11	0.23*
Problem Solving Skills	Ability to Gather Information	-0.05	0.01
	Ability to Analyze Information	-0.02	0.01
	Ability to Detect Problems	0.02	-0.02
	Ability for Structured Thinking	0.12	0.22*
Processing Skills	Verbal Processing Ability	0.11	0.22*
	Non-Verbal Processing Ability	0.05	0.09
Competency		-0.14	-0.13
	Basic Interpersonal Skills	-0.19*	-0.18
	Basic Self-Management Skills	-0.11	-0.06
	Basic Problem-Oriented Skills	-0.05	-0.04

**Correlation coefficient is significant at the 1% level (both sides)

*Correlation coefficient is significant at the 5% level (both sides)

Table 4 shows the Spearman's rho correlations between total TOEIC Listening score differences and PROG scores. Although there are no strong or moderate correlations, there are several weak correlations between PROG Literacy and changes in TOEIC Listening scores for students who entered the university with TOEIC scores under 310. These correlations are significant at a 5% confidence level. These findings support this study's premise that PROG Literacy scores may be indicative of students' language learning ability.

Despite the weak correlations with PROG Literacy, the PROG Competency correlation coefficients are close to zero. This indicates a lack of measurable relationship between students' PROG Competency scores and changes in TOEIC Listening scores.

Table 5. TOEIC Reading Difference and PROG Correlations

		All Scores (n = 160)	TOEIC Under 310 (n = 106)
Literacy		0.16*	0.16
Problem Solving Skills	Ability to Gather Information	0.06	-0.04
	Ability to Analyze Information	-0.02	-0.06
	Ability to Detect Problems	0.02	0.05
	Ability for Structured Thinking	0.19*	0.19*
Processing Skills	Verbal Processing Ability	0.10	0.04
	Non-Verbal Processing Ability	-0.05	-0.08
Competency		0.25**	0.31**
	Basic Interpersonal Skills	0.21**	0.28**
	Basic Self-Management Skills	0.12	0.17
	Basic Problem-Oriented Skills	0.15	0.16

**Correlation coefficient is significant at the 1% level (both sides)

*Correlation coefficient is significant at the 5% level (both sides)

Table 5 shows the correlations between TOEIC Reading score differences and PROG scores. There are a few weak correlations, but most notable is that for students with April TOEIC scores under 310, the overall Competency scores correlate more strongly than the PROG Literacy scores. The .31 correlation is considered a moderate correlation and is significant at the 1% level of confidence. These findings are consistent with the data from Table 3, and indicate that students with higher PROG Competency scores may have greater aptitude for increasing their TOEIC Reading scores. A more likely explanation is that because the TOEIC Reading score differences

are so minimal and the bulk of the students scored 4 or under on the PROG Competency, there is a moderate correlation between students with low PROG Competency scores and minimal difference in TOEIC scores.

Table 6. TOEIC Total Difference and PROG Correlations

		All Scores (n = 160)	TOEIC Under 310 (n = 106)
Literacy		0.21**	0.30**
Problem Solving Skills	Ability to Gather Information	0.02	0.00
	Ability to Analyze Information	0.01	0.02
	Ability to Detect Problems	0.03	0.03
	Ability for Structured Thinking	0.22**	0.28**
Processing Skills	Verbal Processing Ability	0.19*	0.23*
	Non-Verbal Processing Ability	0.00	0.03
Competency		0.04	0.09
	Basic Interpersonal Skills	-0.02	0.02
	Basic Self-Management Skills	-0.02	0.04
	Basic Problem-Oriented Skills	0.07	0.09

**Correlation coefficient is significant at the 1% level (both sides)

*Correlation coefficient is significant at the 5% level (both sides)

Table 6 shows the Spearman's rho correlations between total TOEIC score differences and PROG. The most notable figure here is the .30 correlation between PROG Literacy scores and changes in TOEIC scores after one semester for students who entered the university with under 310 on the TOEIC. This correlation is moderate and significant at the 1% confidence level, and supports the possibility that PROG Literacy scores may be indicative of students' language learning ability.

However, the data also show a lack of correlation between PROG Competency and total TOEIC score changes over one semester. This is in contrast with the findings in Table 5 regarding PROG Competency and TOEIC Reading scores. The contrast here puts further doubt on how substantial the correlation in Table 5 may be. Therefore, additional data and investigation are needed to determine the relationship between PROG Competency scores and TOEIC scores.

Table 7. English Class Grades and PROG Correlations for TOEIC Scores Under 310

	Reading	Writing	Listening	Speaking
PROG Literacy	0.253**	0.298**	0.265**	0.202*
PROG Competency	0.039	0.030	-0.005	0.028

**Correlation coefficient is significant at the 1% level (both sides)

*Correlation coefficient is significant at the 5% level (both sides)

Table 7 shows the Spearman rho correlations for PROG scores and English class final grades for students who entered the university with TOEIC scores under 310. Reading, Listening and Writing classes all had weak correlations with PROG Literacy. These correlation coefficients are all significant at a 1% confidence level. Correlations with Speaking grades are lower, possibly because some students develop their receptive language skills before using their productive language skills.

There were no notable correlations between PROG Competency scores and final grades. These findings are consistent with previous research on PROG scores and GPA and PROG scores and course grades (Uchida et al., 2018; Ito, 2014).

4. Key Findings and Discussion

4.1 Serendipitous findings

Early in the analysis of data, we found that there was a strong negative correlation (-.48) between April TOEIC scores PROG Literacy scores for a group of students with high TOEIC scores (415 – 700). This stood out due to the logical assumption being that students entering university with the highest TOEIC scores would have well-developed literacy skills. However, further investigation revealed that a substantial number of the students with high TOEIC scores and low PROG Literacy scores were non-native Japanese speakers. In addition, the language that some of those students speak at home is not always Japanese. Although some of these students had attended high schools in Japan and done well academically in high school, their low PROG Literacy scores indicate that their ability to read and write is not as high as their peers. This is further supported by the positive correlation (.183) between this group of students' April TOEIC scores and their PROG Competency scores.

The difference in these two correlation coefficients may be attributed to the differences in the linguistic demands of how questions are asked on the two sections of the PROG. Basically, the Literacy section of the PROG requires greater proficiency in

Japanese than the Competency section. For example, “Ability to Detect Problems”, appears in both Literacy and Competency. In Literacy, students have to read a short case study and provide suitable analysis and recommendations, which requires a higher level of proficiency in Japanese than just engaging in daily conversation. However, on the Competency section, questions are short and only require a student to choose an answer on a scale ranging from "Very much" to "Not at all".

The second interesting finding from the early analysis has to do with differences in average PROG scores between female students and male students. For the PROG Literacy, the average score for females was 3.25, while the average score for males was only 2.3. However, males scored slightly higher on the PROG Competency with an average of 3.3 while females averaged 2.94. These differences raise questions for further research. The differences could be due to gender bias on the PROG; or, to differences in types of high schools the males and females in this sample attended; or, the differences could be unique to this sample. Hopefully, additional research can help to explain why males and females scored differently on the two sections of the PROG.

4.2 Correlations of PROG and TOEIC Differences

The most notable correlations as of now in this longitudinal study indicate a positive correlation between PROG Literacy scores and changes in TOEIC sores after one semester. If the data from an additional semester show correlation increases, the data would provide more support for using PROG Literacy scores as an indicator of language learning ability. However, since the correlations thus far are weak, any inferences should be made with caution. Despite scoring only 2 on the PROG Literacy section, 11 students had TOEIC increases of over 100 between April and July. Conversely, 2 students who scored 6 on the PROG Literacy had either no increase or had a decrease in their TOEIC score for the same time period. Therefore, for individual students, a higher or lower PROG Literacy score does not necessarily predict performance on the TOEIC.

5. Conclusion

This report explains the preliminary findings of a longitudinal study that uses statistical analyses of the correlation between PROG scores and TOEIC scores to determine if the PROG might be an indicator of language learning ability. The preliminary findings indicate a number of weak correlations between PROG scores and TOEIC scores.

Similarly, there are weak to moderate correlations between PROG scores and final grades in English classes. With weak correlations it would be difficult to claim that the PROG can be used as a "predictor" of either language learning ability or as a "predictor" of TOEIC performance. However, even a weak correlation can account for 5 to 10% in the variance of TOEIC differences. Therefore, the current findings support the possibility of using the PROG as an indicator of potential language learning ability and/or test-taking ability for tests such as the TOEIC.

There are countless variables that figure into a model for EFL learners to advance their language skills as well as their test-taking skills. The PROG scores, along with knowledge of other variables (high school education, class attendance, extra-curricular commitments and motivation to study), can help teachers understand more about their students in order to plan lessons, design curricula and set realistic goals for teaching.

As a longitudinal study, this research project intends to continue analyzing students' TOEIC scores after a second semester, and collect new data from the 2019 group of freshmen students. Additionally, the researchers intend to conduct deeper analysis of specific generic skills, and their correlations with TOEIC scores. The researchers plan to use regression analysis to build a multi-generic skill model indicating the extent to which those skills may account for specific percentage variances in scores.

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