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Effects of different types of out-of-class learning on TOEIC score gains

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Introduction

The purpose of this study is to examine the effects of out-of-class learning of English by Japanese college students on their proficiency growth measured by TOEIC.

At Hiroshima University, TOEIC IP is administered to first-, second-, and third-year students. Students are expected to take TOEIC IP four times during their course of study at college: about one month after entering university (May); at the end of their first year (February); at the end of their second year; at the end of their third year¹. The data from TOEIC IP are utilized for improving the curriculum of English language education at the university. This study was carried out as part of its process.

Currently at this university, English language classes are provided for the first-year and second-year students. Each grade follows a distinct curriculum. Table 1 is a summary of English language curricula at Hiroshima University.

Table 1 Summary of English curricula at Hiroshima University

		Class content	Number of English classes per week	TOEIC IP
First year (all required)	(Semester 1)	speaking		May
		reading	2	
	(Semester 2)	writing		February
Second year (electives: choose two)	extensive reading	writing	1	February
	presentation	English in media		
Third year		(none)	0	February

The classes for the first-year students are designed as the base for a more advanced level, and constructed so that the students will have opportunities to experience a wide range of communicative activities. In addition, the reading and listening classes include a portion of TOEIC-related instruction. Students are required to take all the four 15-week courses, and they take two 90-minute classes per week. In contrast, second-year classes are focused on a specific form of communication. Students choose two 15-week courses from six choices, and they take one in the first semester and the other in the second semester. Thus, second-year students take one 90-minute class per week. Third-year students are not required to take any English classes.

It seems evident that the curricula do not provide sufficient time for students to acquire a working knowledge of English. Taking one or two classes a week does not guarantee that students will acquire knowledge and skills of English required for their undergraduate academic work and their future career. If students are to acquire a

good command of English, it is necessary for them to study the language even outside the classroom. The university wants to promote students' out-of-class learning of English, and there must be systematic support for them.

To provide effective support for students, it is necessary to consider what type of learning should be recommended to learners. Unfortunately, there is no empirical evidence regarding this point: although discussion of independent learning is active, no empirical study has been reported to date that compares different types of independent study in terms of the development of learners' proficiency in the target language. Studies on independent learning tend to discuss learner characteristics such as approaches to independent learning (e.g., Rowsell & Libben, 1994; Pickard, 1996; Umino, 1999), metacognition and learning strategies (e.g., Victori & Lockhart, 1995; White, 1995), and beliefs about language learning (e.g., White, 1999). These studies, however, do not analyze the effectiveness of independent study. In a different line of research, there are a few studies that discuss the effectiveness of independent learning, such as Jones (1998) and Wongsothorn (1989), though the interest of these studies is in investigating whether taking on independent learning leads to success in learning the target language, not in the effectiveness of different types of independent learning.

The lack of empirical evidence led the authors to conduct the current study. We conducted a survey on what students do to study English out of class. The data from the survey were later combined with the TOEIC IP data, enabling the analysis of the effect of students' learning in relation to their TOEIC score gains.

Method

Participants

The participants of this study were first-, second-, and third-year students at Hiroshima University in the 2006 academic year (spanning from April, 2006 through March, 2007). There were about 2500 students in each grade, with a total of about 7500 in the three grades. From this population, the students who did not undertake out-of-class learning of English were excluded². In addition, since the analysis used two-wave data collected in two TOEIC test occasions (pre- and post-tests), those who were absent from either of the two test occasions were excluded from the analysis. Also excluded were those whose pre-test scores were below 200. This is to prevent overestimating the effects of learning (For details, see the Method of Analysis section). Table 2 shows the number of participants subjected to the analysis.

Table 2 Numbers of participants subjected to analysis

	First year	Second year	Third year
<i>N</i>	1107	764	850

Measures

Proficiency measure

This study used TOEIC scores as measures of participants' proficiency. The scores were obtained from TOEIC IPs administered by the university in 2006 and 2007. This is two-wave data, and focus of the analysis was on how students' scores changed over a period of approximately one academic year. First-year students were analyzed using the data in May 2006, collected one month after their entrance to college, and in February 2007, collected at the end of their first year of study. Second-year students were analyzed using the data in February 2006, which is the end of their first year of study, and in February 2007, which is the end of their second year of study. Third-year students, like second-year students, were analyzed using the data collected in February 2006, which is the end of their second year of study, and in February 2007, at the end of their third year of study.

Out-of-class learning behavior

A questionnaire was devised to collect data on students' out-of-class learning behavior and relevant information. There were 25 items. These items were developed through discussions by the authors. The first 10 items relate to students' motivation for learning English. The data from these motivation-related items were not used in this study since the focus of the study is not on students' motivation. Items 11 through 23 in Table 3 relate to out-of-class learning³. The last two items (items 24 and 25) target study time; item 24 asks about the amount of time spent on homework set in English classes, and item 25 about out-of-class studying not related to homework. Study time is an index of learners' effort toward, and persistence in learning, both of which are aspects of their behavior affected by motivation (Graham & Weiner, 1996; Dörnyei, 2005). The items relating to study time were used as covariates of the post test. There is a preamble to this questionnaire which specifies that the questionnaire items concern out-of-class learning of English.

Table 3 Questionnaire items

Do you do any test-preparation for TOEIC?

- 11 Study with TOEIC preparation materials available at bookstores
- 12 Receive TOEIC-related instruction through distance education or internet sites
- 13 Receive TOEIC-related instruction at a language school or university

Do you do anything to study English other than preparing for TOEIC?

- 14 Study with broadcast English language learning programs on TV/radio
- 15 Receive instruction through distance education or internet sites of learning English
- 16 Take a class at a language school or hire a tutor
- 17 Join a students' English club
- 18 Study with learning materials such as books, videos, DVDs for learning English
- 19 Read books, magazines, newspapers, internet sites written in English
- 20 Create opportunities to experience natural English by, e.g., watching TV dramas, news programs, movies, listening to music
- 21 Create opportunities to use English with somebody by, e.g., exchanging emails, talking, letters
- 22 Create opportunities to use English by yourself by, e.g., keeping diary,
- 23 Take a trip overseas

Looking back on this semester, how many hours per week did you spend on studying English? Exclude the English class time.

- 24 The time for homework of English classes (assignment, preparation, review)
 - 25 Other than no.24
 - 1 less than 1 hour
 - 2 over 1 hour, less than 3 hours
 - 3 over 3 hours, less than 5 hours
 - 4 over 5 hours, less than 7 hours
 - 5 over 7 hours
-

Items 11 through 23 are binary questions: Students answer by choosing either YES or NO depending on whether the statements are true of themselves. For items 24 and 25, they choose the most appropriate category.

This questionnaire was administered at the time of TOEIC IP in February, 2007. Questionnaire sheets were distributed in advance, and the students were instructed to answer it before the test began. The sheets were collected after the test ended.

Categorizing learners by types of learning

Using the data from the out-of-class learning questionnaire, the participants were categorized into three groups of different types of learning. Characteristics of the groups were as follows.

TEST-PREP: Students who did test-preparation only

(Marked YES for any of items 11-13, but NO for all items 14-23)

GENERAL: Students who followed a general type of English learning, not test-preparation, to gain a command of English.

(Marked NO for all items 11-13, but YES for any of items 14-23)

MIXED: Students who did both test-preparation and general English learning

(Marked YES for any of items 11-13, and YES for any of items 14-23)

The number of participants in each category is shown in Table 4.

Table 4 Number of participants assigned in each category

	MIXED	GENERAL	TEST-PREP	Total
First year	420	423	264	1107
Second year	282	333	149	764
Third year	349	340	161	850

Method of analysis

When comparing two or more groups, it is common practice to employ a statistical method of comparing means, such as a *t*-test or analysis of variance, with the grouping factor as the independent variable. If a significant difference is found, it is concluded that the difference is caused by the grouping factor.

However, in this study, comparing means does not constitute a valid analysis because a number of intervening factors are suspected. A significant difference of means cannot be attributed solely to the independent variable, i.e., type of learning. For example, a difference in means could be attributed to the effects of study time. If students employ several different methods of learning, as found in the MIXED category, it is likely that they spend more time on studying than the students in the other groups, and further, that the learners in MIXED may gain higher scores than the other groups due to the benefit of the greater amount of study time, not type of learning *per se*. Another possible cause of a mean difference is proficiency. There is a general consensus among teachers that students at a low proficiency level are likely to develop their proficiency more rapidly than those at a high proficiency level. Even if the result of a statistical analysis shows that the score gain of a particular group is smaller than another group, it may be that one group is disadvantaged by the students' existing high proficiency.

There is still another possible intervening factor which is of importance and of great interest to teachers. It is suspected that the effects of type of learning may be moderated by proficiency. In a simple mean comparison, the result is only about a main effect, assuming that a particular type of learning is good for all the learners. However, it may be possible that a certain type of learning works well for students at a low proficiency level, while students at a higher proficiency level may benefit more from

another type of learning. This is suggested by Robb and Ercanbrack (1999), who conducted an experiment of the effects of direct test preparation on TOEIC score gains by Japanese college students. They did the experiment on two samples: English majors and non-English majors. Results showed that non-English majors, whose proficiency level was lower than English majors', improved their scores at a statistically significant level, but English majors did not appear to have benefitted from the instruction. These results from the two different samples suggest, as Robb and Ercanbrack (1999) say, that test-preparation may be beneficial for students of a low proficiency level, not students of a high proficiency level. In other words, it is likely that the effects of test-preparation are moderated by students' proficiency. If this is the case, it is possible that the effects of other types of learning are also moderated by students' proficiency.

Taking the above observations in consideration, this study used the General Linear Model (hereinafter, GLM). The GLM is an extension of regression analysis (StatSoft, Inc., 2007) and subsumes *t*-test, analysis of variance, analysis of covariance, and other methods (Cohen, 2001; Rutherford, 2001). Although it may sound strange that separate methods of analysis can be incorporated into a single method, it is possible to convert methods such as the *t*-test and analysis of variance into regression analysis by using dummy coding or effect coding (Cohen, 2001; Pedhazur, 1997). Therefore, in the GLM, independent variables can be both categorical and continuous. In addition, the GLM can incorporate interaction between independent variables. These features allow a more flexible analysis than the *t*-test, ANOVA, and other methods of analysis.

In this study, the GLM was applied to the first-, second-, and third-year students separately. This is to conceive of them as constituting different populations because different grades followed different curricula.

A model was specified to predict the post-test score (TOEIC IP scores in February, 2007) using the following variables.

- Pre-test score (TOEIC IP scores in May, 2006 or February, 2006)
- Type of learning (categorization by the questionnaire data)
- Study time (1) (time for doing homework of English classes)
- Study time (2) (time for voluntary study of English)
- Interaction between Pre-test score and Type of learning

Study time (1) and (2) were treated as continuous variables. In the analysis of the third grade, Study Time (1) was not included because this grade does not have English language instruction and this variable was irrelevant.

Students whose pre-test scores were below 200 were excluded from the analysis. This measure was taken to prevent overestimation of the effects of type of learning. Some learners did not take the university-administered TOEIC tests seriously. Such

students tended to stop marking or to fall asleep during the test, and their scores tended to be extremely low. If some learners are lazy in the pre-test but put a little effort into the post-test, the post-test score will jump from the pre-test. However, the rise of the scores does not reflect the development of the students' proficiency. If this happens, the effects of a certain type of learning will be overestimated. In order to prevent this as much as possible, scores below 200 at the pre-test were regarded as the result of laziness, and students in this low score band were excluded from the analysis.

In the computations of the GLM, Type III sum of squares, or adjusted sum of squares, was employed. Type III sum of squares is the amount of variation explained by a variable when all the other variables in the model have been statistically eliminated (Grafen & Hails, 2002). The statistical package used for the analysis was Statistica ver. 6.1.

Results

First-year students

Table 5 shows descriptive statistics of the dependent and independent variables by categories of type of learning.

Table 5 Descriptive statistics (first-year students)

	<i>N</i>	Post-test		Pre-test		Study time (1)		Study time (2)	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
MIXED	420	520.738	134.671	498.083	126.327	1.588	1.050	1.181	1.146
GENERAL	423	491.300	122.363	477.482	115.038	1.312	0.888	0.650	0.911
TEST-PREP	264	474.924	110.485	466.648	96.376	1.242	0.838	0.420	0.693
Total	1107	498.564	125.804	482.715	116.041	1.400	0.953	0.797	1.013

Table 6 is the result of the GLM on the first-year students' data, summarizing whether the effects of the independent variables were statistically significant at the alpha level of .05.

Table 6 Results of GLM (first-year students)

	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Intercept	174531.625	1	174531.625	33.911	0.000
Type of learning	1354.401	2	677.200	0.132	0.877
Pre-test	9053975.044	1	9053975.044	1759.166	0.000
Study time (1)	33328.449	1	33328.449	6.476	0.011
Study time (2)	42396.839	1	42396.839	8.238	0.004
Pre-test x Type of learning	3915.475	2	1957.738	0.380	0.684
Error	5656271.385	1099	5146.744		

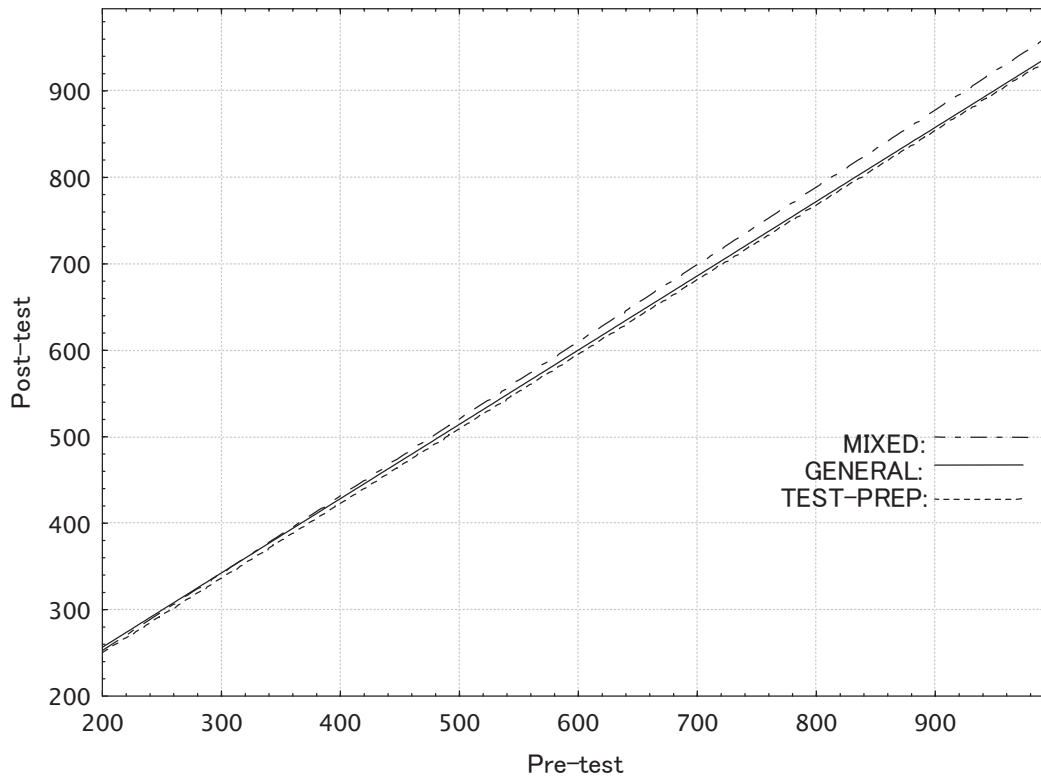


Figure 1 Graphical representation of the effects of types of learning (first-year students)

Second-year students

The same analytical procedures as those used in the first-year students' data were applied to the second-year students' data. Table 8 shows descriptive statistics of the dependent and independent variables by categories of type of learning.

Table 8 Descriptive statistics (second-year students)

	<i>N</i>	Post-test		Pre-test		Study time (1)		Study time (2)	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
MIXED	282	542.589	129.653	521.791	109.736	1.468	0.981	1.238	1.168
GENERAL	333	508.649	128.256	502.643	105.609	1.156	0.988	0.679	0.939
TEST-PREP	149	495.134	108.485	491.577	87.954	1.107	0.823	0.275	0.614
Total	764	518.541	126.470	507.552	104.516	1.262	0.967	0.806	1.044

Table 9 is the result of the GLM on the second-year students' data, summarizing whether the effects of the independent variables were statistically significant at the alpha level of .05.

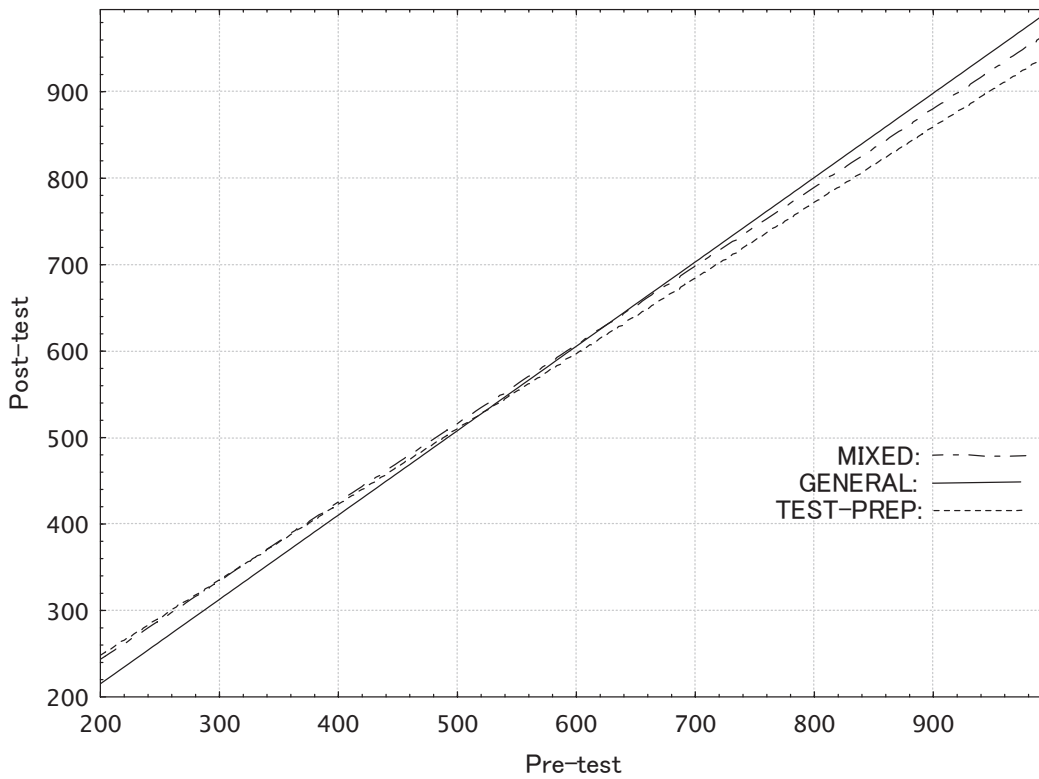


Figure 2 Graphical representation of the effects of type of learning (second-year students)

Third-year students

Table 11 shows descriptive statistics of the dependent and independent variables by categories of type of learning.

Table 11 Descriptive statistics (third-year students)

	<i>N</i>	Post-test		Pre-test		Study time (2)	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
MIXED	349	498.567	133.520	483.209	124.749	1.378	1.150
GENERAL	340	501.162	138.996	503.706	124.163	0.815	1.110
TEST-PREP	161	444.410	102.883	442.205	102.760	0.559	0.921
Total	850	489.347	132.251	483.641	122.521	0.998	1.141

Table 12 is the result of the GLM on the third-year students' data, summarizing whether the effects of the independent variables were statistically significant at the alpha level of .05.

Table 12 Results of GLM (third-year students)

	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>p</i>
Intercept	183574.437	1	183574.437	34.122	0.000
Type of learning	36499.488	2	18249.744	3.392	0.034
Pre-test	6481124.203	1	6481124.203	1204.699	0.000
Study time (2)	137482.388	1	137482.388	25.555	0.000
Pre-test x Type of learning	34907.109	2	17453.554	3.244	0.039
Error	4535230.846	843	5379.871		

Significant effects were found on all the independent variables including the interaction between type of learning and pre-test.

Multiple comparison of the interaction term was conducted by performing the same GLM procedures in a pairwise manner. The critical ratio of .05 was adjusted by Bonferroni correction, i.e., dividing 0.05 by 3 (the number of pairwise comparisons). Therefore, the alpha level was set at .05/3 (=0.0166...).

P-values of the interaction terms in the pairwise GLMs were as follows:

TEST-PREP v.s. MIXED	<i>p</i> = .088
TEST-PREP v.s. GENERAL	<i>p</i> = .012
GENERAL v.s. MIXED	<i>p</i> = .694

A *p*-value smaller than the adjusted alpha level was found in the comparison between TEST-PREP and GENERAL, suggesting a statistically significant interaction.

Table 13 shows estimated parameters of the independent variables in the model predicting the dependent variable (post-test).

Table 13 Estimated parameters (third-year students)

	Parameters	<i>SS</i>	<i>t</i>	<i>p</i>
Intercept		66.960	11.463	0.000
Type of learning	MIXED	5.482	14.629	0.375
	GENERAL	-38.878	14.950	-2.601
	TEST-PREP	33.396		0.009
Pre-test		0.844	0.024	34.709
Study time (2)		11.979	2.370	5.055
Interaction	Pre-test x MIXED	0.004	0.030	0.139
	Pre-test x GENERAL	0.076	0.030	2.514
	Pre-test x TEST-PREP	-0.081		0.012

From these estimations, the following equations were derived for each type of learning.

$$\begin{array}{l}
 \text{MIXED: } 0.848 \\
 \text{GENERAL: } 0.920 \times \text{Pre-test} + 11.979 \times \text{Study time} + 72.442 \\
 \text{TEST-PREP: } 0.763 \quad \quad \quad (2) \quad \quad \quad 28.083 \\
 \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad 100.356
 \end{array}$$

The grand mean of study time (2) (see Table 11) was substituted for the corresponding term in the above equations. Following this procedure, the equations are represented as follows:

$$\begin{array}{rcl}
 \text{MIXED: } & 0.848 & 84.393 \\
 \text{GENERAL: } & 0.920 \times \text{Pre-test} + & 40.034 \\
 \text{TEST-PREP: } & 0.763 & 112.307
 \end{array}$$

Since a significant interaction was found in TEST-PREP and GENERAL, these two groups' equations are graphically represented first (Figure 3). As the interaction is significant, the slopes of the lines are not identical. The two lines intersect around 460 on the pre-test.

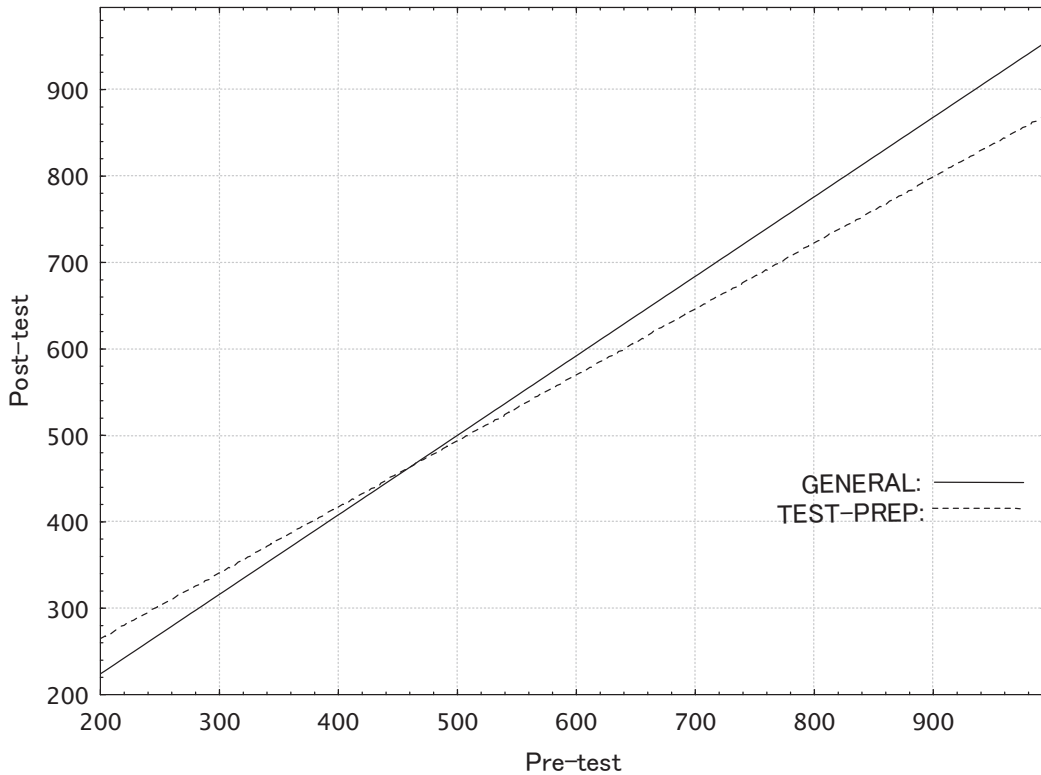


Figure 3 Interaction in the sample of TEST-PREP and GENERAL

Figure 4 shows graphical representations of all the three groups' equations. Although it is not a statistically significant interaction, the slope of MIXED is a little deviant from the other two. The line of MIXED intersects with that of GENERAL around 616 on the pre-test, and with TEST-PREP around 328 on the pre-test.

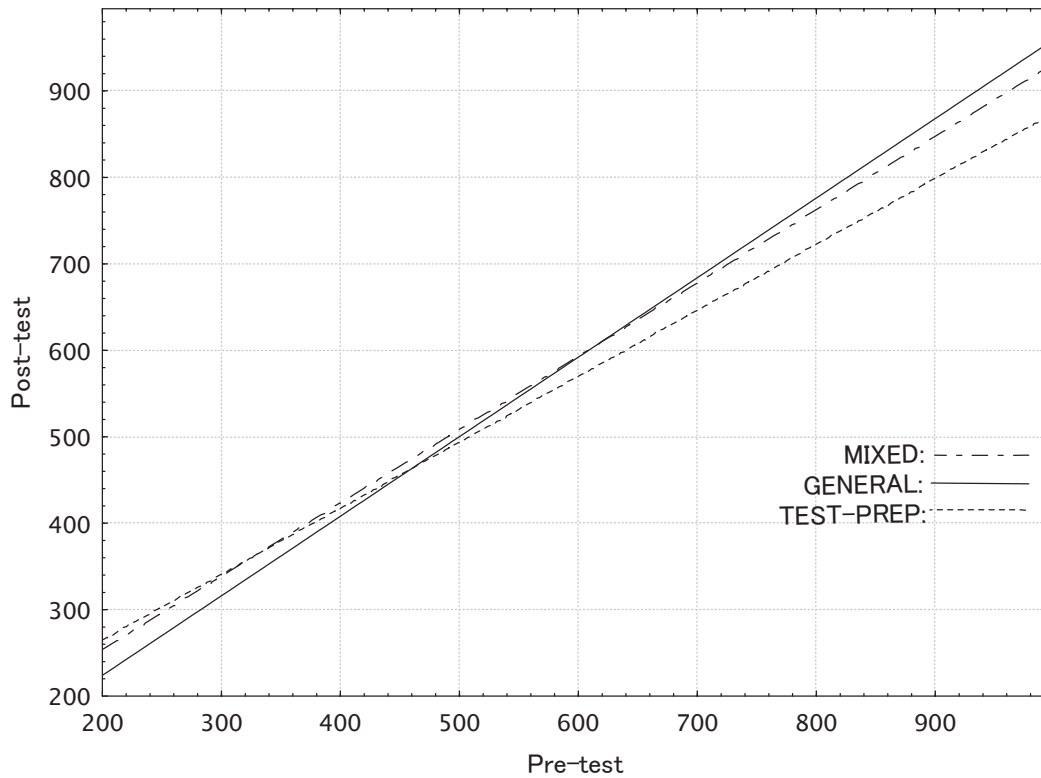


Figure 4 Graphical representation of the effects of type of learning (third-year students)

Discussion

Our primary concern is what type of learning works best for the students. Looking at the results with regard to the effects of type of learning and interaction terms, it is evident that the results are not consistent across the three grades. This is probably due to the differences in the curricula. Therefore, it is necessary to take into consideration the characteristics of the curricula and their effects on students' TOEIC scores.

A significant main effect of type of learning and a significant interaction between type of learning and pre-test were found only in the third-year students' analysis. This grade did not receive English instruction, and it is likely that different effects of types of learning were manifested. On the other hand, in the analyses of the first- and second-year students, main effects of type of learning and interaction terms were not statistically significant. It is likely that since the students received some varieties of instruction, difference of types of learning outside the class were averaged out.

However, it is worth noting that, comparing the results of the first- and second-year students, the slopes are slightly different. The characteristics of the second-year students are closer to the third-year students' than to the first-year students'. The

second-year curriculum is focused on specific forms of communication, in contrast to the first-year curriculum providing a wide range of communication experiences plus TOEIC-oriented instruction. It is possible that different effects of types of learning were more manifest in second-year students because the effects were less counter-balanced by classroom instruction, which provided a narrower range of varieties of learning than first-year students' curriculum.

Third-year students showed a significant interaction between type of learning and pre-test, suggesting that effects of types of learning differ depending on the students' proficiency. One interpretation of this is that a certain type of learning works the best for some learner, but not all. In this sample, a significant interaction was found in TEST-PREP, a group of students who did only test-preparation, and GENERAL, a group of students who followed a general type of learning to gain a command of English. The equations, under the assumption that both groups studied for the same length of time, intersected around 460 on the pre-test. This suggests that students with scores over 460 are likely to benefit more from a general type of learning than test-preparation. On the other hand, the opposite is likely to be true for those with scores below 460, who benefit more from test-preparation than a general type of learning. This seems to coincide with the remark by Robb and Ercanbrack (1999) that test-preparation may be beneficial for students of a low proficiency level, not students of a high proficiency level.

In addition to the effects of type of learning, there is another aspect worth considering. It seems that the range of score gains is affected by proficiency. For example, if we look at Figure 1, students around 300 on the pre-test are predicted to score about 340, a gain of about 40 points. However, students with 500 on the pre-test are predicted to be around 520 on the post-test. Students with 600 on the pre-test are predicted to be around 600 on the post-test. This shows that students' score gains are affected by their proficiency: the higher their proficiency is, the less they gain. This needs to be considered in relation to study time. Figure 1 and the other graphs represent equations derived after substituting grand means of study time: The graphs show the score gains under the assumption that study time is the same for all the learners. Taking this assumption into consideration, the result can be read as suggesting that score gains differ according to the students' proficiency if they spend the same amount of time on studying. Therefore, students at a high level of proficiency must spend more time studying if they want to advance their TOEIC scores as much as students at a low proficiency level.

This study has some limitations, particularly in regard to data collection. TOEIC scores were, to a large extent, under the influence of students' commitment to the test. Although a measure was taken to minimize the effects of laziness by eliminating students whose pre-test scores were extremely low, there could still remain influences attributable to students' commitment. Since this study was a survey, not an experiment, control of such effects was not thorough. In addition, the questionnaire on

out-of-class learning behavior was probably not sensitive enough to capture all the students' learning behavior because students may have changed their studying methods during the period between the pre- and post-tests. The questionnaire failed to capture such changes, leaving room for a reasonable doubt about classification of learners by type of learning. Furthermore, it must be noted that quality of learning was not accounted for. Doing out-of-class learning does not necessarily guarantee that the learning is effective and successful. Some learners may have taken the approach to learning reported in the questionnaire because they knew quite well about what they needed to do to develop their competence in English, while others may have simply followed a familiar approach that they had taken before, without knowing what they should do for effective learning. These limitations make the findings of this study far from conclusive. More research is needed in order to gain a clearer idea concerning what type of learning works best for what type of students.

Notes

- 1 The schedule of test administration was changed after this study was conducted. Students admitted in 2008 or a later year take the test four times in their first two years.
- 2 This group of learners was excluded from the analysis in order to simplify interpretations of the results. As shown in the Results section, the effects of study time is averaged across the three groups of learners by substituting the overall means for the terms of study time. This measure enables the interpretation of the effects of types of learning in a simple format. This would be impossible if the analysis included the group of students who did not undertake out-of-class learning because this would cause a contradiction. If overall means of study time across the four groups of learners, including those who did not study independently, were calculated and the values were substituted for the terms of study time in the equations, this would indicate that all the four groups did at least some level of out-of-class learning. It is, of course, not the case.
- 3 This part of the questionnaire is an inventory of learning behavior, not a scale for measuring latent factors. The responses to these items are treated as dichotomous variables, and they are not to be summated. Thus, factor analysis, a typical procedure for confirming the validity of a scale, was not employed, nor was Cronbach's alpha.

References

- Cohen, B. H. (2001). *Explaining psychological statistics* (2nd ed.). New York: John Wiley & Sons, Inc.
- Dörnyei, Z. (2005). *The psychology of the language learner: Individual differences in second language acquisition*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Graham, S., & Weiner, B. (1996). Theories and principles of motivation. In D. C. Berliner, & R. C. Calfee (Eds.), *Handbook of educational psychology* (pp. 63-84). New York: Simon & Schuster Macmillan.
- Grafen, A. & Hails, R. (2002). *Modern statistics for the life sciences*. Oxford: Oxford University Press.
- Jones, F. R. (1998). Self-instruction and success: a learner-profile study. *Applied Linguistics*, 19, 378-406.
- Pedhazur, E. J. (1997). *Multiple regression in behavioral research: Explanation and prediction* (3rd ed.). Wadsworth.
- Pickard, N. (1996). Out-of-class language learning strategies. *ELT Journal*, 50, 150-159.
- Robb, T. N. & Ercanbrack, J. (1999). A study of the effect of direct test preparation on the TOEIC scores of Japanese university students. *TESL-EJ*, 3. Retrieved: <http://www.cc.kyoto-su.ac.jp/information/tesl-ej/ej12/a2.html>
- Rutherford, A. (2001). *Introducing ANOVA and ANCOVA: A GLM approach*. London: SAGE Publications.
- Rowell, L. V. & Libben, G. (1994). The sound of one hand clapping: how to succeed in independent learning. *The Canadian Modern Language Review*, 50, 668-687.
- StatSoft, Inc. (2007). *Electronic Statistics Textbook*. Tulsa, OK: StatSoft. WEB <http://www.statsoft.com/textbook/stathome.html>.
- Umino, T. (1999). The use of self-instructional broadcast materials for second language learning: an investigation in the Japanese context. *System*, 27, 309-327.
- Victori, M. & Lockhart, W. (1995). Enhancing metacognition in self-directed language learning. *System*, 23, 223-234.
- White, C. (1995). Autonomy and strategy use in distance foreign language learning: research findings. *System*, 23, 207-221.
- White, C. (1999). Expectations and emergent beliefs of self-instructed language learners. *System*, 27, 443-457.
- Wongsothorn, A. (1989). Comparative study of English teaching and learning at graduate level by direct teaching, self-instruction, and personalizing instruction. *PASAA: Journal of Language Teaching and Learning in Thailand*, 19, 56-60.

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