

**AC 2010-527: INVESTIGATING DEMOGRAPHIC VARIABLES OF LEARNERS  
LEARNING PERFORMANCE TOWARD UBIQUITOUSLY PODCASTING IN  
PROJECT-BASED ENGLISH LEARNING**

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# **Investigating Demographic Variables of Learners Learning Performance toward Ubiquitously Podcasting in Project-Based English Learning**

## **Abstract**

Project-Based English Learning (PBEL) in teaching has resulted in numerous positive outcomes, including students' improved language abilities and increased content knowledge (Stoller, 2006)<sup>17</sup>. This e-commerce English course has a specific purpose, which is to offer learners more convenient instruction through ubiquitously podcasting instructions. The purpose of this study is to investigate if students using podcasting instruction perform differently on knowledge tests than students who receive traditional instruction. Additionally, demographic variables relating to performance on e-commerce knowledge tests when using podcasting instruction will be examined. A quasi-experimental, nonequivalent control group pre-test/ post-test design was used in this study. The data indicated that podcast learning can indeed improve the learner's performance. The results also showed that gender was not found to significantly impact learners' performance; however, socio-economic status and daily Internet usage were found to have a significant impact. In the future, if teaching can integrate podcasting adequately, podcasting can aid students in more effective learning.

**Keywords:** Podcasting Ubiquitously Learning, E-Commerce English Module, Project-Based English Learning (PBEL), Demographic Variables, Learning Performance

## Introduction

Globalization has allowed for increased interaction worldwide, and people can now access information easily from foreign countries through the Internet. Therefore, language plays a critical role in allowing people from different countries to share the same information (Chou, 2007)<sup>2</sup>. The importance of language has become a major issue around the world. In Taiwan, English has become the most popular second language, and it has become a popular topic of discussion. People feel that they can improve their English language skills, regardless of their age. Almost every Taiwanese student is required to study English from elementary school through graduate school (104Learn, 2006)<sup>20</sup>. Although students are required to study English, the effects have been limited, and improving the situation has become a main concern in Taiwan. The continual improvements in information technology have helped to educate people, and this research attempts to discover whether IT can help students learn English.

Recently, the use of Web 2.0 tools in teaching and learning has become a development trend and an important topic in teaching science and technology. After blogs, podcasts have become the rising star of new Web 2.0 tools. Richardson (2006)<sup>15</sup> pointed out that podcasts can be applied to educational learning. Lane (2006)<sup>9</sup> indicated that podcasts can help students understand class content better. Evans (2008)<sup>4</sup> found that podcasts could effectively reduce the burden on teachers to stimulate students' interest, enhance self-study, and promote teamwork. Podcasts have been proven to be an effective teaching tool, and, therefore, researchers have tried to find out whether podcasts can help students learn English.

Flanagan and Calandra (2005)<sup>5</sup> believe that there is potential for using podcasts in language learning situations. E-commerce English is one kind of English for specific purpose (ESP). The purpose of this study is to establish a podcasting instruction learning system for a project-based e-commerce English to help students improve their English ability and enable them to focus on their weaknesses. Therefore, this study will establish a podcast system and produce a project-based e-commerce English module to which students can subscribe in order to learn e-commerce English. The central theme of this research is to investigate whether students using podcasting instruction perform differently on an e-commerce English knowledge test from students who receive traditional instruction. The research question also focuses on how demographic variables relate to performance on an e-commerce English knowledge test when using podcasting instruction. The researchers propose the application of teaching and learning technologies to e-commerce English as a university teaching method in Taiwan. Therefore, university faculty with a strong ability in foreign languages and information technology can help students establish a foundation of competitiveness in international languages and a habit of

lifetime study. This study aims to encourage English teachers to increase their information technology capability and apply this technology in ESP teaching.

## Literature Review

The learning of English has become a major issue in non-English speaking countries. In 2001, the Japanese government found that nearly 10 million Japanese over the age of 10 had learned English (McNicol, 2004)<sup>13</sup>. In Taiwan, English education has been emphasized by the government and schools during the past decade (104Learn, 2006)<sup>20</sup>. A major concern of the Taiwanese people is how to improve their efficiency and effectiveness when learning English (Hsu, 2003)<sup>8</sup>.

With the emergence of mobile learning, some researchers have noticed that mobile devices may help language learning. In Japan, Thornton and Houser<sup>19</sup> researched vocabulary via e-mail and cell phones in 2001. They designed mini lessons and sent them to students' cell phones. The results showed that students enjoyed those lessons. In 2004, McNicol<sup>13</sup> also discussed the possibility of learning languages through cell phones in Japan. Researchers in Taiwan are also conducting such surveys. Tan and Liu (2004)<sup>18</sup> developed a MOBILE-Based Interactive Learning Environment (MOBILE) to support the learning of English in elementary schools. The results indicated that learning through mobile devices increased students' interest and improved their learning. Liao, Chi and Ou Yang (2003)<sup>10</sup> also proposed a mobile system based on a grid service to support language learning. They tried to improve the effect of mobile language learning from a technical perspective, and they decided to use mobile learning aids in the English learning environment to integrate learning theory strategies and technology for students to learn English as an example of learning activities.

Podcasting shares multiple features and characteristics with mobile learning. Learning through podcasting is one of the newest methodologies for the next generation's learning (Chen, 2009)<sup>1</sup>. "Podcast is comprised of either audio or video MP3/MP4 recordings that can be downloaded directly to the desktop computer as well as to various mobile devices. It uses subscription feeds with Really Simple Syndication notification which automatically informs the subscriber as and when new material is available" (Harris and Park, 2008)<sup>7</sup>. Video or audio podcasts can be a useful tool to supplement practical exercises such as business simulations (Lonn, 2009)<sup>11</sup>. There are some podcasting Web sites that deal with language learning. The "English as a Second Language" podcast was constructed by Dr. McQuillan (2006)<sup>14</sup>, and this Web site was designed to help second-language students learn English. The content covers many topics including traveling, business, health/medicine, shopping, etc. The "On Demand English" Web

site focuses on business English learning and it emphasizes English usage in a business environment. Many language-learning Web sites use podcasting as an aid to language learning. Therefore, podcasting has the potential to help people learn a language. According to Stoller (2006)<sup>17</sup>, “Within these short-term intensive English programs, project-based learning can take a central role. A flexible methodology which allows for English skills and subject-based or technical skills to be developed in an integrated way, project-based learning enables teachers and students to move beyond the limitations of the traditional intensive English curriculum” (p. 23). Practitioners also report that project work results in improved decision-making abilities, analytical and critical thinking skills, and problem solving. Therefore, the purpose of this study is to establish a podcasting instruction mobile learning system for a project-based e-commerce English to help students improve their English ability and enable them to focus on their weaknesses in certain e-commerce content.

## Research Method

A quantitative methodology design was used in this research consisting of a quasi-experimental, nonequivalent control group pre-test/post-test design. The experimental group was administered podcasting instruction, while the control group received traditional instruction on the required project-based e-commerce English concepts. In total, 100 students (70 females, 30 males) who majored in applied foreign languages participated in this study. The students in the sample came from a variety of socio-economic backgrounds. The overall ratio of females to males was 7:3. Most of the students (97%) used the Internet every day. The participants of this study were assigned randomly to the control group and the experimental group. Selection was determined by using a table of random numbers to select students randomly according to their student ID number. Each group consisted of 48 to 52 students. Thirty items on a knowledge test of project-based English learning (PBEL) for e-commerce English content were used to assess students’ performance. The paradigm for this design is presented in Table 1.

Table 1  
*Randomized Control and Experimental Groups Pre-test and Post-test*

Group	N	Assignment	Treatment	Pre-test and Post-test
E	52	R	X	Y
C	48	R	T	Y

*Note.* R = random assignment to groups; E = experimental group; C = control group; N = number of students in each group; X = received podcasting instruction; T = received traditional instruction; Y = received pre-test and post-test.

A podcast system was set up to produce a project-based e-commerce English module for Taiwan Ching-Yun University's Applied Foreign Languages Department students to use to learn e-commerce English. Podcasting instructions consisted of audio and video MP3/MP4 recordings that could be downloaded directly to a computer or various mobile devices. It used subscription feeds with Really Simple Syndication notification that automatically informed the subscriber when new material became available (Harris and Park, 2008)<sup>7</sup>. The students in the experimental group were required to watch the podcasting instructions recorded from the other control group's class meetings within 18 weeks of the scheduled class. The content included the video and audio footage from the class meeting, and the material was presented exactly as seen by students sitting in the classroom with the instructor. The undeniable benefit of podcasting instruction is its ability to allow students to pause for reflection or to replay portions of a class for review (Chen, 2009)<sup>1</sup>. The test was administered in the spring of 2009 during class time to ensure that all questions were completed at the same time and in the same setting. Each group had the same instructor who was taught at Ching-Yun University. The e-commerce English knowledge test was administered to both groups before and after the experiment. This was done to determine initial e-commerce English knowledge as well as changes that occurred over the 18 weeks of instruction. The researchers administered all of the tests, and the results were reported as combined data for groups only. All the data were accumulated and analyzed for statistical analysis.

The e-commerce English knowledge test was provided by the researchers. The major purpose of the knowledge score is to provide a comprehensive measurement to determine whether academic growth is evident across e-commerce English knowledge areas. The test was the instrument used to gather data and it consisted of two sections. One section included three demographic questions; the second section included 30 multiple-choice questions. The demographic questions were intended to determine (a) socio-economic status, (b) daily Internet usage, and (c) gender. Thirty items on e-commerce English content knowledge included (a) 10 listening comprehension tests, (b) 10 reading tests, and (c) 10 writing assessments. The 30 knowledge content items were reviewed by five professional faculty members and 10 university students. The reliability of an instrument determines whether the instrument provides an accurate assessment of the characteristics measured (Gable & Wolf, 1993)<sup>6</sup>. The internal consistency reliability coefficient, Cronbach's  $\alpha$ , was reported as .92 for the test questions. The validity of an instrument refers to the usefulness, appropriateness, and meaningfulness of the specific inferences

made from the test scores (Gable & Wolf, 1993)<sup>6</sup>. The content validity ratio, CVR, was reported as .86 for the test questions.

## Results

The first research question focused on investigating whether students using podcasting instruction performed differently on the e-commerce English knowledge test than students who receive traditional instruction. The pre-test and post-test e-commerce English knowledge score means for the control group were compared using the dependent *t* test at a .05 level of significance. The results presented in Table 2 indicated that the control group performed significantly better on the post-test than on the pre-test,  $t(47) = -2.33, p < .05$ . The pre-test and post-test e-commerce English knowledge score means for the experimental group were also compared using the dependent *t* test at a .05 level of significance. The results presented in Table 2 show that the experimental group performed significantly better on the post-test than the pre-test,  $t(51) = -16.18, p < .05$ .

Table 2

*Dependent t Test Between the Pre-test and Post-test Knowledge Score Means for the Control and Experimental Group*

Group	<i>t</i>	<i>df</i>	<i>p</i>
Control group	-2.33*	47	.020
Experimental group	-16.18***	51	.000

\* $p < .05$ . \*\*\* $p < .001$ .

The differences between the control and experimental groups' pre-test score means were examined by an independent *t* test (Table 3). The results showed no significant difference between the means,  $t(98) = -1.78, p > .05$ . This indicated that the experimental group pre-test score mean was not significantly different from the control group pre-test score mean. The differences between the control and experimental groups' post-test scores were examined by an independent *t* test (Table 3) that produced a statistically significant difference,  $t(98) = -15.44, p < .05$ . This indicated that the experimental group post-test score mean was significantly higher than the control group post-test score mean. These results indicate that the students using project-based e-commerce English podcasting instruction showed a significantly better performance than

students using traditional project-based e-commerce English instruction.

Table 3

*Independent t Test for the Pre-test and Post-test Knowledge Score Means for Control Group Versus Experimental Group*

Test	<i>t</i>	<i>df</i>	<i>p</i>
Pre-test	-1.78	98	.078
Post-test	-15.44***	98	.000

\*\*\* $p < .001$ .

Research Question 2 concerned how demographic variables relate to learning performance on an e-commerce English knowledge test when using podcasting instruction. Data were analyzed using a stepwise multiple regression technique. As noted in Table 4, the results of the stepwise multiple linear regression produced a statistically significant  $R^2$  of .86 ( $F = 7.34, p < .05$ ). As depicted in Table 4, a stepwise multiple regression analysis for Question 2 revealed that socio-economic status (SES) made a significant contribution to the change in  $R^2$ . Approximately 52% of variance was accounted to affect performance by the SES variable. The daily Internet usage variable had a significant contribution to the change in  $R^2$ . Approximately 34% of this variance was accounted to affect the performance. Conversely, the gender was excluded in this study.

Table 4

*Results of the Stepwise Multiple Regression by Selected Variables on Students' Performance on an E-Commerce English Knowledge*

Variable	<i>R</i>	$R^2$	Adjusted $R^2$	<i>F</i>
Socio-economic status	.72	.52	.50	37.28***
Daily Internet usage	.58	.34	.31	7.34*

\* $p < .05$ . \*\*\* $p < .001$ .

Furthermore, as noted in Table 5, the results showed the Pearson product-moment correlation coefficient between post-test scores and SES was .869. The results indicated that SES had a strong

positive relation to students' performance. Moreover, the results indicated that the Pearson product-moment correlation coefficient between post-test scores and daily Internet usage was .653. Daily Internet usage also had a strong positive correlation with students' performance. Finally, the results showed the Pearson product-moment correlation coefficient between post-test scores and gender was .126, indicating that gender has a rare relationship to students' performance when using podcasting instruction in the e-commerce English curriculum.

Table 5  
*Pearson Product-Moment Correlation Coefficients Between Socio-Economic Status, Daily Internet Usage, Gender and Post-test Score for the Experimental Group*

Variable	Post-test score	Gender	SES	Daily Internet usage
Post-test score	—	.126	.869	.653
Gender		—	.216	.301
SES			—	.721
Daily Internet usage				—

*Note.*  $n = 100$ .

## Conclusion

The undisputed leader of current trends on the Internet is Web 2.0, which has shaken every field, including education. At the Harvard Extension School, they apply podcasting to their Computer Science E-1 class. Berkeley University lists course schedules in podcasting terms. More and more schools are using podcasts, including Stanford University, Illinois University, MIT, Princeton, etc. (Chou, 2007)<sup>2</sup>. Lonn (2009)<sup>11</sup> found that learners can use podcast materials largely for reviewing concepts and issues raised in lectures that they have already attended. These studies were less certain about whether podcasts can improve students' learning performance. The findings of this study revealed that using podcasting instruction significantly improved students' performance on the e-commerce English knowledge test compared to traditional e-commerce English instruction. Since both the control and experimental groups were at a similar e-commerce English knowledge content level before this experiment podcasting instruction significantly improved students' performance for a project-based e-commerce English course at Ching-Yun University. Studying English through podcasting instruction is an attractive way to improve the

efficiency of English learning and literature review also shows the positive results of combining language learning and podcasting. Therefore, podcasting can be one of the solutions to problems in learning English. Technology such as podcasts can help students increase their foreign languages abilities and professional skills. In the near future, if teaching methods can integrate podcasting instruction adequately, podcasting instruction can aid students in a more effective learning performance.

In the results of the stepwise multiple linear regression analysis, each construct has a significant p-value, which means that SES and daily Internet usage will affect the learning performance of podcasting positively. In these two constructs, SES affects learning performance the most. According to the findings of this study, participants' SES was related to their performance in the e-commerce English curriculum when using podcasting instruction. The SES variable was found to be strongly positively correlated to students' performance when using podcasting instruction for e-commerce English classes. The reasons that the SES variable was associated with students' performance in using podcasting may include (a) higher SES families had higher expectations for English curriculum scores, and (b) higher SES families can support students' learning needs more than lower ones. These findings are congruent with Spotts and Bowman (1993)<sup>16</sup> who demonstrated that SES factors influence the usage of technology in new learning environments, including the availability of equipment and the funds to purchase materials. Another study showed that households in rural areas are less likely to have Internet service than those in urban areas. Technological inequality is more pronounced for rural, low-income minority students (Collins & Dewees, 2001)<sup>3</sup>.

Daily Internet usage stands as the second most important factor that positively influenced the learning performance of podcasting instruction. Consequently, daily Internet usage would be an important reference for learning performance when using a podcasting instruction to learn project-based e-commerce English. Also, the daily Internet usage variable was found to be strongly positively related to students' performance when using podcasting instruction for e-commerce English classes. One reason that daily Internet usage affected students' performance may because of the limited time of the present sample using podcasting instruction. The current study indicated that direct and vicarious interaction with Internet increased the user's sense of control, confidence, and stimulated interest for learning effectively.

Gender was not related to students' performance when using podcasting instruction for e-commerce English classes at Ching-Yun University in Taiwan. The findings in the present study were congruent with Lu (2000)<sup>12</sup>, who found a weak relationship between gender and learning

performance in curriculum environments in Taiwan. The reasons that the gender variable was not associated with students' performance in using podcasting instruction may include (a) the number of the female participants was not equal to the number of the male participants in this experiment, and (b) Taiwanese male and female students' learning styles may be similar.

Interactive podcasting instruction is not only interesting for users, but it also helps them form a highly efficient learning environment. Podcasting instruction may not completely replace traditional teaching in the future, because interactive podcasting instruction materials must be cost effective to help teachers in their preparation. This study aims to help teachers understand that students can learn anytime and from anywhere with the new instructional technology. By extending this study, researchers hope to cultivate a new generation of instruction to use digital technology to teach more effectively; students can benefit from new technology because it is more effective in helping students learn.

The contributions of this research may be beneficial in that (a) the findings can guide Ching-Yun University's administrators' decisions about adopting podcasting in English education; (b) podcasting instruction can be used to help university students in Taiwan learn English; (c) the integration of podcasts for teaching e-commerce is helpful for teachers; (d) the upgraded characteristics of podcasts can make the e-commerce English teaching module easier and faster through the Internet; and (e) the implementation of podcast use in teaching e-commerce English teaching is feasible. The goal of this study is to help instructors make informed choices when evaluating current tools and practicing in the real world. In the future, if teachers can adopt an appropriate teaching strategy and incorporate multimedia such as podcasting into the teaching environment, the researchers believe this will improve students' learning achievement.

Research is a valuable process. Educators should adopt the most efficient means available for students to benefit from instruction. The following recommendations are made for further studies.

1. This study should be replicated in other English courses using a longer period of time for podcasting.
2. This study should be replicated using other English education programs to determine whether the use of podcasting is effective for different types of English education.
3. Periodic follow-up studies should be conducted on the effects of age and other demographic variables on English education performance when using podcasting.
4. This study should be repeated across other schools to determine whether the significant results found in this study remain constant in other locations.

5. It would have been significant to discover to what extent this tool improved the participants' future learning.

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