Study of Bilingual Learning Motivation and Efficiency with Traditional and Multimedia CALL on-line Approaches from Perspectives of Knowledge Management: Quantitative and Qualitative Analysis of English Learning Achievement in Taiwan Tertiary Education

Hen Kwang Chen, PhD, Lecturer, Jin-Wen University of Science and Technology, Taiwan

ABSTRACT

The knowledge economy has come about and society has proceeded to a new era of knowledge management. Thus, teachers must adjust their teaching methods and integrate ongoing learning with our teaching strategies. Living in the world of the knowledge economy, teachers and students actively explore, learn, and create new knowledge. Meanwhile, the trend of globalization is making English more important than ever. With the advent of the knowledge economy era as part of the trend of globalization, English holds a strong position in the world and is regarded as a language of power and success. The concept of English learning has thus evolved. The widespread adoption of computers and the internet in the midst of the knowledge economy and globalization has made the use of multimedia as a tool to learn English commonplace. Learning English with the assistance of a computer has become an unavoidable trend.

The purpose of this study is to assess and study bilingual learning motivation and efficiency. The research analyzes the relationship between a student’s English learning methods and their language test performance from the perspective of knowledge management. The methodology is composed of the literature review, the quantitative/experimental and qualitative/observation approaches. This research is divided into three major parts including:

1. Literature review: the era of globalization, knowledge learning concept of management and traditional and multimedia approaches of English learning theories.

2. Quantitative research (experimental study) / Qualitative research (observing and interviewing students): assessing relationships between the traditional and multimedia approaches by teaching the university students and analyzing their achievements. Afterwards, the researcher interviews students to discover their learning motivations and viewpoints of advantages/disadvantages toward these two approaches.

3. Conclusion/Suggestions: A 6-month long intensive experimental project was conducted and the researcher made a detailed analysis of the variables which contribute to the success of students learning English. Participants consisted of 80 students from an intensive English language program at an university in Taipei County. All students began at a basic level and were randomly assigned to the 2 equally-sized groups of either traditional or multimedia teaching programs. The researcher is interested in determining which of the 2 approaches is better at teaching a target language (English) to students. The quantitative and qualitative researches were then analyzed to reach the conclusion and make further suggestions.

Keywords: Globalization Era, Knowledge Economy, Knowledge Management, Traditional, Multimedia Method

INTRODUCTION

Globalization is what happens when the movement of people, goods or ideas among countries and regions accelerates. The ever-increasing contact between people in different countries in the era of globalization has made communication skills more important than ever before. As the process of globalization continues, the great need for global communication and inter-personal contact has begun to change English teaching in Taiwan as it has all over the world (Coatsworth, J. H. 2004). In order to meet the increasing demand for high-caliber English speaking staff from multi-national corporations and government agencies dealing with foreign affairs, more and more English teachers are beginning to adjust their course plans, laying stress on language, culture, and communication in order to reinvent
themselves, as we look at the globalization 1 trend from the perspectives of knowledge management (Block D. & Cameron D.2002).

Due to the educational diversity and resultant knowledge explosion in this era, English education can be characterized as the way teachers assist students to spontaneously learn by heart. The development of knowledge enhances relationships among countries as well. Nowadays, knowledge is becoming the primary source of economic and academic values (Cornu, Bernard. 2003). With the sheer number of technologies and volume of knowledge available, teachers must enlighten and assist students to hone and maintain their competitive abilities. English teachers adjust their teaching methods and make ongoing learning an integral part of their teaching strategies. With knowledge management as a goal, English teachers should be able to adapt teaching techniques and to make their students’ learning more useful and efficient (Scholte. J. A. 2001).

With many convenient electronic resources available to students nowadays, such as electronic books, computer based training (CBT), etc., students won’t be satisfied with simple recitation of facts during classroom teaching (Moore, M. 2003). Therefore, in order to help students learn well, English teachers must integrate different teaching methods and search for new approaches for teaching. They should think about how to enhance the efficiency of their pedagogical methods, for instance, properly harnessing computer assistance systems to enhance class teaching efficiency and engagement (Selinger, M. 2008).

**LITERATURE REVIEW**

**Era of Knowledge Management**

The advances in technology and communication imply unprecedented levels of ever-increasing globalization. Scholte. J. A. asserts that “globalization refers to processes whereby many social relations become relatively de-linked from territorial geography, so that human lives are increasingly played out in the world as a single place” (Scholte. J. A. 2001). With the passing of time, the trend of “globalization” has engulfed the world and has greatly contributed to people’s zeal to learn English in Taiwan. The ever-increasing contact between people in different countries resulting from globalization has made communication skills more important than ever before. Consequently, English learning in Taiwan education has to become more diverse and have greater importance attached to it (Moore, M. 2003).

The term “English” signifies an international language that is used by people of different nations to communicate with one another. English is needed for good communication. Globalization has changed the world in many ways, and it changes the conditions under which English learning takes place because globalization has brought more intimate contact among people from different parts of the world (Koscielecki, M. 2002). In fact, with the trend of globalization driving easy knowledge acquisition, how to select and manipulate knowledge is now a crucial issue. The concept of knowledge learning has evolved towards a vision based more on managing and creating rather than simply learning alone. Some knowledge is found to be well-established fact while some knowledge may be dynamic, being constantly shaped by new experience and insights. Knowledge is generated as various information sources are tested and combined with past experience and learning. People possess various forms of knowledge, and that knowledge is creative, dynamic and adaptable (Coatsworth, J.H. 2004).

Knowledge management reflects a concern for developing a well-expressed and logical long-term plan for the intellectual assets of an individual. It is based on the recognition that the knowledge held by individuals is a valuable commodity. Knowledge is made up of principles and facts which can be explained to others; each person possesses a unique knowledge set (Block, D. & Cameron D. 2002). It can be shared with people since it can be documented, categorized, transmitted as information, and illustrated to other through demonstrations, explanations and other forms of sharing. A broad range of thoughts on knowledge management discipline exist with no unanimous agreements. The stages of knowledge management consist of the main categories of knowledge storage/learning and knowledge application/acquisition can be classified and summarized to accommodate English teaching methods (Coatsworth, J. H. 2004).
Trend of Multi-media Learning

More recently, the concept of learning English has evolved with the advent of the era of globalization. English is seen as a tool of international communication and is regarded as a language of power, prestige and success. As scholars analyze how English spreads, “English, it is generally agreed, is today in a stronger position in the world and the “hegemonic” status of English has been assured in the process of globalization as “it conveys the greater part of the world’s educational, scientific, technological and commercial information.” ( Dörnyei, Z. 1997 ). English is being learned by more and more individuals as an additional language. It is central to a growing global economy, and it is the major language of a developing mass culture.” ( Bax. S. 2000 ).

In research on modern English teaching, Bax concludes that “there is a movement away from the centralized and the standardized English curricula. This decentralization and deregulation in policy gradually grants more autonomy to schools at all levels.” ( Heller, M. 2005 ). Under these circumstances and with the perspective of knowledge management, multimedia teaching materials to assist English learning becomes unavoidable. Multimedia teaching approaches overcome time and space constraints because they offer the choices for users to study in their own preferred setting, location or facilities. Students can also choose their own studying pattern to complement their level of knowledge ( Glisan, E.W. 1995 ; Smith, L. 2008 ).

Further, multimedia provides students more opportunities to study. Multimedia teaching has many advantages; first, it is more personal. Computer aided instruction offers personalized communication to learners and teachers because computer aided instruction systems can effortlessly monitor any number of individual students. Second, it can reduce pressure for bashful students ( Lindsay A and Gawn J 2005 ). Multimedia teaching uses words, sounds, animation and images in class through course software. Third, students can choose teaching materials that they are interested in. The use of a virtual environment means students are not limited to the classroom and students can study whenever or wherever they want. As a result, students can use multimedia materials to review lessons even after school, and teachers can identify the students’ preferences and design one’s teaching materials accordingly. Furthermore, the cost of PCs and CD-ROMs continues to fall rapidly as the market grows ( Heller, M. 2005 ). Many publishers recognize this expansion and have started to release localized versions of their products; the phenomenon of globalization also promotes the growth of multimedia systems . ( Bax. S. 2000 ).

Today, colleges/universities enjoy more autonomy in curriculum planning and development, so faculty members can decide on their own what they want to teach their students and how to teach it. Based on students’ practical needs and abilities, tailor-made course plans may implement auxiliary computer systems and will definitely improve students’ motivation to learn English and make teaching more interesting ( Smith, L. 2008 ). With the widespread adoption of computers and the Internet in the midst of the knowledge economy of globalization, using the computer as a tool to teach and learn English has become common because the effects of learning can be seen quickly and errors can be found and corrected immediately ( Heller, M. 2005 ).

Learning English with the assistance of a computer has become an inevitable trend of knowledge management. With the assistance of computers and the Internet, this kind of cooperative learning aimed at using language for communicating effectively will become more interesting and attractive. Teachers may devise a variety of teaching programs according to students’ level of familiarity with the Internet. It conforms to the principle of individualized instruction as well as constituting the reactive learning environment. What’s more, it maintains students’ learning motivation and cuts external interference. It helps to expose learning difficulties more easily and allows teachers to give guidance efficiently ( Heller, M. 2005 ; Spolsky, B. 2004 ).

Comparison of Traditional and CAI Methods

Traditional English teaching has some advantages; the teaching methods are simple and convenient; it conserves time and effort and it can deal with tests and testing. Traditional teaching is humanistic; teachers stand in as a moderator and handle interactions to maximize learning and this improves communication skills. In contrast, according to Koscielacki, M., the disadvantage of traditional teaching approaches is that they are low on efficiency (Koscielacki, M. 2002 ). This is because the scope is small and the level is low; because teachers are authoritative in the classrooms, there is inhumanity. Traditional teaching can easily be boring for learners because there is not enough time or power to teach
every individual specifically. The researcher also discovered from McKay, S.L., research paper,18, the characteristics of traditional bilingual teaching methods including the “Grammar Translation Method” and “Audio-Lingual Method”, these approaches commonly appear in classrooms. The “Grammar Translation Method” and “Audio-Lingual Method” usually rely on mechanical drill, which makes teaching boring and neglects training of reading and writing. However, students can’t conceptualize and express their ideas, reducing motivation to study (McKay, S.L. 2002).

Comparing these two methodologies, traditional learning is often limited by frameworks such as a teacher’s professional background and material design; whereas on-line learning places importance on the subjects established by learners after they break through the limitation of space (Selinger, M. 2008). Further, traditional learning may facilitate instant and authentic communication and interviews, while on-line learning requires the use of information media in order to provide communicative channels. In addition, traditional learning is a single path, but on-line learning may help learners with diverse needs due to a wealth of different content and methods. (Chern C. 2003; Cornu, Bernard. 2003).

Traditional learning as a single path helps learners identify a clear direction and goal, thus a learner has a lower chance of getting lost or having trouble; on-line teaching has higher interaction rates. Even though it may lead to cognitive confusion and loss for learners, it has relatively higher rates of cognitive extension and expansion. In addition, multimedia teaching is more convenient than traditional teaching, as it presents various functions that traditional teaching does not. The E-touch program enables students to learn English in a very easy and convenient manner. The multimedia environment is created by using computers as an interactive textbook (McKay, S.L. 2002). The E-touch program offers many kinds of lessons for students to use. Students can choose lessons they desire to learn. For improving ‘listening’, students can listen hundreds or thousands times. It can be repeated until students can use the word or phrase they chose (Watson, Deryn. 2003).

Computer-Assisted Language of On-Line System (CALL on-line)

Starting in the 1960’s, the computer-assisted language learning on-line (CALL on-line) system was widely used in the 1990’s and 2000’s. CALL on-line learning originally referred to the teaching technology based on features of electronic information, including video tapes, cassette tapes, satellite TV, and computer aided-training before the current Internet; therefore, it is also known as Web-based Learning or CALL on-line Learning. (Chen H.R. 2003). CALL on-line learning must still integrate teaching situations and devices, and especially needs to digitize traditional materials. CALL on-line is an approach where computer technology is used as an aid to the presentation, with reinforcement and assessment of material to be learned, including a substantial interactive element (Larsen-Freeman, Diane. 2008). CALL on-line advanced non-linear and co-operative opportunities as it attached language learning theories to the progress of information technology, so the role it plays also shifts. CALL on-line is discovery learning in which students get the opportunity to experiment with quasi-real-life situations. Heller, M. believes there will be enormous growth and development of CALL on-line in the English curricula of the future. The teaching materials of Computer-assisted language learning CALL on-line have characteristics (Heller, M. 2005).

CALL on-line is flexible in age and level, provides action-packed content, natural interaction with the learner as well as combining media resources such as attached books and audiotapes. Learners can manipulate variables and observe the outcome by using CALL without a time limitation. Therefore, CALL on-line can be cost saving and also allows teachers to offer an English curriculum more effectively (Willis, D. and Willis, J. 2001). Otherwise, the essential feature of CALL on-line is breaking down the barrier formed by time and space, and additionally replacing or assisting traditional teaching methods and features. Compared with traditional teaching, CALL on-line not only decreases the cost of human resources, but increases students’ willingness to learn and their happiness as well. As a result, students’ motivations are stimulated and promoted (Smith, M.R. 2002).

Quantitative and Qualitative Studies

The research started with a literature review of the relevant sociolinguistic studies in order to provide a basis for analysis the result. The first section of this paper is a review of the literature, addressing both empirical and theoretical aspects of the role of CALL on-line and traditional teaching theories of different methodologies. By implementing
quantitative and qualitative research methods, further analysis between CALL on-line and traditional English learning efficiency are presented. This study employed a quantitative experimental case study and qualitative interviewing methods to gain an in-depth and holistic understanding of learners’ perspectives and the efficiency of the two teaching methods.

This study assesses bilingual learning motivation and efficiency. The relationship between the efficient English learning methods of students and their language test performance from the perspective of knowledge management would be analyzed. A 6-month long intensive experimental project (IEP) in a middle-size university was conducted and participants consisted of 80 freshmen students from different departments enrolling in this particular intensive English program. The researcher made a detailed analysis of variables which contribute to the success of students in learning English. After analyzing the quantitative data, the primary qualitative research data used for analysis were the transcripts of the post-observation interviews. The participating students were interviewed using open-ended questionnaires designed to elicit the students’ motivations and their perspectives toward the two teaching approaches. Conclusions are presented and suggestions are made for further research through this cross-analysis of quantitative and qualitative method results.

The researcher and the teaching assistants (TA) designed the content of teaching materials. The teaching curriculum was made up of 3 major English sections which consisted of part 1 of social studies section (natural park, traffic safety, the U.S. government system) part 2 of science section (a look into space, modern technology, renewable energy) and part 3 of language section (speeches, analogies, letter writing). All teaching curricula regard articles for vocabularies, reading and leistering. Two highly qualified teachers were invited to conduct this program by implementing the 2 different teaching approaches. The traditional method was classroom orientated while the CALL on-line method was multimedia oriented by utilizing E-touch learning on-line facilities. The 2 English teachers’ educational and teaching backgrounds tightly fit these 2 different teaching pedagogies and the 2 teachers are assigned to the 2 student groups: (1) traditional method classroom orientation (2) CALL on-line method (multimedia orientation).

A pre-test and post-test for assessing student proficiency were both carried out. Based upon the concept of knowledge management in the globalization era, the test materials most fitted to the current trend would be (1) management learning: listening comprehensive and (2) management acquisition: oral expression. For the study, a statistical analysis including (1) descriptive statistics and (2) statistic T-test was adopted to compare the characteristics of the two bilingual methods. The independent variable was the choice of 2 teaching methods while the dependent variable was the learning performance of the 2 respective groups.

After noting the quantitative methods of learning achievement, the participating students were personally interviewed by the researcher and TA through the designed questionnaires to gain insight on the students’ motivations and their perspectives toward the two teaching approaches. Of the 80 students who were invited to study using the traditional-classroom orientation and CALL on-line multimedia orientation program, the qualitative interview analysis of those students’ motivations and attitudes toward the two bilingual approaches before and after learning English were analyzed. Eventually the quantitative and qualitative research were compared and analyzed to reach the conclusion.

**Data Analysis**

Conclusions were presented based upon the data of the 2 study groups. After the 6-month IEP learning period, the results of the posttest scores reveal some similarities between the 2 approaches. Also, the results show striking significant difference in some areas of English learning. The results for the various analyses are presented following each of these descriptive sections. The next table shows the means, standard deviations (S.D.), and correlations of all the variables included in the English learning models; the independent-sample t-test shows that the hypothesis is rejected at a significance level of 95% for all control strategies.
Table 1: the analysis of students’ performances by the comparison between 2 methods.

<table>
<thead>
<tr>
<th></th>
<th>Teaching Approach</th>
<th>Student Period</th>
<th>Means</th>
<th>S.D.</th>
<th>Difference (I – J)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge Learning:</td>
<td>I : Traditional</td>
<td>40 Pretest</td>
<td>66.03</td>
<td>4.05</td>
<td>0.23</td>
<td>0.838</td>
</tr>
<tr>
<td></td>
<td>J : CALL on-line</td>
<td>40 Pretest</td>
<td>65.80</td>
<td>4.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comprehensive Listening</td>
<td>I : Traditional</td>
<td>40 Posttest</td>
<td>65.56</td>
<td>4.45</td>
<td>-15.77 *</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>J : CALL on-line</td>
<td>40 Posttest</td>
<td>81.63</td>
<td>11.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knowledge Application:</td>
<td>I : Traditional</td>
<td>40 Pretest</td>
<td>65.26</td>
<td>4.52</td>
<td>-0.3</td>
<td>0.776</td>
</tr>
<tr>
<td>Oral expression</td>
<td>J : CALL on-line</td>
<td>40 Pretest</td>
<td>56.56</td>
<td>3.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I : Traditional</td>
<td>40 Posttest</td>
<td>68.50</td>
<td>4.59</td>
<td>-17.46 *</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>J : CALL on-line</td>
<td>40 Posttest</td>
<td>85.96</td>
<td>11.02</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(*p<0.05)

The pre-tests examined the participating students’ English proficiency before the IEP program. The analyzed data indicated that there was no statistically significant difference in English scores between the 2 groups. The students showed equal starting capabilities in English. Next, all subject participants were evenly divided and randomly assigned to the 2 learning groups. These two groups were both expected to perform well; teachers and TA would make their best effort to instruct them.

The study process would be observed and results would be collected constantly. At the beginning, the two learning groups show no significant difference in the pretest scores. After the IEP learning period, the results on the posttest showed that the CALL on-line group’s comprehensive listening skills (management learning) were significantly higher than the traditional classroom group’s. Meanwhile, the results on the oral expression (knowledge acquisition) posttest scores showed that the CALL on-line group was significantly superior to the traditional classroom group in this dimension as well.

The following figures demonstrate the pre-test/post-test of participating students’ performance between these 2 English learning groups.

![Figure 1: Students’ pre-test and post-test performance in the 2 English learning groups.](image)

Quantitative and Qualitative Result

First, the participants in this study were selected from the population of Chinese-speaking students enrolled in an university-level intensive English as a second language program at an university in Taiwan. The students were comprised of 80 Taiwanese/Chinese speakers who learned English as a second language and they were college-aged. The students recruited for this supplemental intensive teaching program were invited on a random basis. Of the 80
students, the participants involved with this research can be further categorized by their level of English language proficiency. Almost all of the students’ English capabilities can be classified as beginners according to the placement test administered prior to the start of the intensive program.

After collecting all the necessary data for this study, the researcher adopted both quantitative and qualitative research methods. Next, all subject participants were evenly divided and randomly assigned to the 2 learning groups. Through analyzing quantitative data, the pre-tests examined the participant students’ English proficiency before the programs. The data analysis indicated that there was no statistically significant difference in English scores between the 2 groups. The students showed equal starting capabilities in English. The pretest scores show no significant difference at the beginning among the two learning groups. After IEP learning, the results on the posttest showed that the CALL on-line groups’ comprehensive listening skills (knowledge learning) were significantly superior to the traditional classroom groups. Meanwhile, the results on the oral expression (knowledge acquisition) posttest scores showed that the CALL on-line groups were significantly superior to the traditional classroom group. Obviously, the experimental result showed that both the comprehensive listening (knowledge learning) and oral expression (knowledge acquisition) abilities of the CALL on-line group was significantly superior to the traditional classroom group.

To analyze qualitative data, after interviewing students and processing their thoughts, the researcher arranged and classified the traits and characteristics of the 2 approaches. For traditional group student, these traits include that this teaching approach can easily be boring for students, it does not allow enough time for practice and leans on students’ ability to learn spontaneously. Once students are reluctant to learn, this method turns out to be inefficient. Further, teachers need to spend extra time assisting students and leading the students without instruction if teachers do not have time to direct them.

The traditional approach is limited by frameworks, for example, teachers’ limited knowledge and character, inappropriate teaching materials, and restricted class locations may cause low-motivation in students. Also, the classroom audio-visual equipment relies on mechanical drill so students cannot grasp the real meaning or application of the scenario. In a comparison with traditional teaching methods, multimedia teaching is convenient as it presents a variety of functions to students. Its programs enable students to automatically learn English in an easier way. With many kinds of diverse curricula provided, students can choose their favorite chapters to read and write repeatedly.

**Study Suggest**

Globalization brings challenges and opportunities as well. The community is international nowadays. As people are more and more closely related with those in other parts of the world, they are finding it almost impossible to alienate themselves from world affairs. Obviously, the impact brought by globalization is multi-dimensional. It influences people from almost all walks of life. Therefore, English learning in Taiwan education must become more diverse and efficient. The question of how to prepare students for the future job market is one that English teachers need to address. Knowledge is the most cherished remedy for complexity and uncertainty and it’s the process of translating information and experience into a meaningful set of relationships which are understood and applied by an individual. As the process of identifying, achieving and disseminating the intellectual assets these valuable tools are critical to an individuals’ performance.

The trend of knowledge management has pushed tertiary education to move from basic to applied research, and English teachers should bring their curriculum closer to the market and economic development to meet the demands of globalization. Cooperation and integration are also areas that English teachers need to work on. With a flow of information that is more open and rapid in the era of globalization, school is not the only source for knowledge. The call for a combination of theories and practices has gained support from both the academic world and industry. Modern technology and computer science leads to the age of knowledge management and knowledge management results in the era of globalization.

The multi-media instruction method specializes in both knowledge learning and application, which make it especially suited to tests which require both free-form response and problem-solving. It also provides a good alternative to teachers because multimedia teaching methods overcome time and space constraints by offering the choices for users to study in their own preferred setting, location or facilities, allowing students more opportunities to study. It fuses
elements from traditional and computerized methods to deliver on the strengths of both for the aim of enhancing students’ competence. Accordingly, the findings of this analysis have important implications for future research and test development.

The study results raise issues for university teachers to consider. English teachers always think about enhancing the efficiency of their pedagogical methods; they realize that in order to achieve this goal, they must understand how students think. This study indicates that multimedia instruction was effective in increasing and improving the performance and achievement of students. While it may appear at first glance that multimedia teaching is superior, every situation is unique. Every teacher has his or her own strengths, and has a given set of circumstances in which they must work. Teachers should analyze the qualitative strengths and weaknesses of each strategy and apply them to their own style and situation. Ideally, teachers can arrive at a solution that confers the advantages of both. Through 6 months of research, the CALL on-line teaching method has advanced considerably. This study has shown that CALL on-line can improve students’ learning performance as the design of the interface provides clear, consistent, and attractive communication. With the various options to choose from when learning language, teachers have all kinds of options when they set up their learning objectives.

For further suggestions, school administrations could make a great effort to offer adequate computer facilities. English teachers could integrate multimedia software into their teaching curriculum and the outcome could be beneficial to his or her students. Cognitive learning helps students process new information by taking advantage of knowledge and aptitudes. Under the principles of CALL on-line theory, knowledge makes sense; with assistance of auxiliary multimedia facilities, learning becomes more interesting. It has significance to students when they spontaneously apply and create knowledge and it is more meaningful than inert knowledge created by rote memorization.

REFERENCES


