CHAPTER V

SUMMARY, CONCLUSIONS, RECOMMENDATIONS

Chapter Five presents a brief summary of this study and the findings from Chapter Four. The conclusions as well as implications for language testing are presented. Finally, recommendations for future research are also provided in this chapter.

Summary of the Study

The purpose of the present study was to examine the relationships among selected student variables which could predict their success in the CBT reading proficiency of the university students. It aimed to firstly explore the relationships among computer familiarity, computer anxiety, and computer attitudes. Secondly, it explored the relationship between each of the variables and the reading comprehension CBT scores. Finally, it investigated the extent to which the three variables individually or in combination predicted the reading CBT scores.

This study was based on theories of reading comprehension and language testing as well as studies concerning computerized tests, test-takers' computer-related variables and correlational studies.

The samples of this study were a group of 90 fourth year students from the Faculty of Communication Arts at Dhurakij Pundit University (DPU). They were randomly selected and put into three groups according to their language ability corresponding to their average achievement scores in Foundation English courses. Thus, there were 30 students in each group.

Research instruments in the study were the Computer Anxiety, Familiarity, and Attitudes Rating Scale (CAFARS) and the Reading Comprehension Computer-Based Test (RC-CBT). The CAFARS was developed to measure the selected computer-related variables. It consisted of two parts, a rating scale and an open-ended question. The RC-CBT was developed to measure the reading comprehension performance of the subjects through the computer mode. Both instruments were

validated by three content specialists and statistic coefficients were obtained via the CTIA program and the SPSS program.

Data were collected and statistically analyzed using the correlation analysis and the multiple regression analysis. Pearson's correlation analysis was applied to investigate the relationships among the independent variables as well as to investigate the relationship between the three independent variables and the RC-CBT scores of students with high, average, and low language abilities. The multiple regression analysis was then employed to investigate the extent to which the three variables predicted the RC-CBT scores of the students with high, average, and low language abilities. Finally, the answers from the open-ended question are analyzed.

Summary of the Findings

In this section, the summary of findings from the correlational analysis and the multiple regression analysis was presented. In addition, a brief summary of the analysis of the answers to the open-ended question was reported.

1. Findings from the Correlational Analysis

The relationships among the selected variables were investigated to test Hypothesis 1: "There are significant relationships among the three variables of test-takers of high, average, low, and combined language ability groups at the .05 level" and Hypothesis 2: "There is a significant relationship between each variable and the RC-CBT scores of test-takers of high, average, low, and combined language ability groups at the .05 level".

In this study, Pearson product-moment correlation coefficients were calculated to indicate the relationships among those variables of students with high, average, and low language ability groups.

1.1 The Relationships among the Independent Variables

The first hypothesis examined the significant relationships among the three variables of test-takers. The first hypothesis in this study was broken down into four sub-hypotheses which are Hypothesis 1.1 - 1.4 with respect to the sample groups.

The results indicated that computer attitudes and computer anxiety were significantly and negatively correlated in all groups. There was a moderate negative relationship between the two variables for high, low, and combined language ability groups while there was a less moderate negative relationship for the average language ability group.

There was a moderate positive relationship between computer attitudes and computer familiarity in high and low language ability groups and a mild positive relationship in the combined language ability group, but there was no significant relationship in the average language ability group.

The relationship between computer anxiety and computer familiarity was moderately and negatively correlated for the high, low, and combined language ability groups, but there was no significant relationship in the average language ability group.

Therefore, Hypotheses 1.1, 1.3, and 1.4 are accepted at the significant level of .05 while Hypothesis 1.2 is partially accepted at the .05 level.

1.2 The Relationship between Each Variable and the RC-CBT Scores

The second hypothesis investigated the significant relationship between each variable and the RC-CBT scores of the students. The second hypothesis was also broken down into four sub-hypotheses which are Hypothesis 2.1 – 2.4.

The results revealed that the RC-CBT scores correlated with computer attitudes of the high, average, low, and combined language ability groups at moderate, and less moderate levels. There was a moderate negative relationship between the RC-CBT scores and computer anxiety of the high language ability group while there was a weaker relationship for the moderate, low, and combined language ability groups. The correlation coefficients between the RC-CBT scores and computer familiarity showed moderate relationships for the average and low language ability groups and also show mild relationship for the combined language ability group. There was no significant relationship for the high language ability group. Therefore, Hypothesis 2.1 is partially accepted while Hypotheses 2.2, 2.3, and 2.4 are accepted at the .05 level.

2. Findings from the Multiple Regression Analysis

The extent to which the three variables individually or in combination could predict the RC-CBT scores was investigated to test Hypothesis 3 which was broken down into four sub-hypotheses i.e. Hypothesis 3.1 – 3.4.

The results revealed that computer attitudes had a significant influence on CBT scores for students of high and combined language ability groups. Hypotheses 3.1 and 3.4 were thus accepted. For students with the average language ability, computer familiarity had a significant influence on their RC-CBT scores. Therefore, Hypothesis 3.2 was accepted. However, none of the predictor variables could significantly predict the RC-CBT scores of the test-takers with the low language ability. Thus, Hypothesis 3.3 was rejected.

3. Findings from the Analysis of the Answers to the Open-Ended Question

The answers from the open-ended question of the questionnaire which asked the participants to write their opinions, comments, or suggestions about the use of computer-based tests in language testing were analyzed in order to explore the participants' ideas about the use of CBT. The answers were categorized into three groups which were favorable, unfavorable, and neutral. It was found that the ratio of percentage of categories of each group of different language abilities was more or less the same. The majority of all participants (87.77%) had favorable attitudes toward the use of the CBT language test. 5.55% showed unfavorable attitudes toward the test while 6.66% were neutral.

Those who preferred the use of CBT said that they liked the computer sets and the CBT application features. On the contrary, the participants who did not like the test mentioned that it caused eyesores and one of them did not like the font size. Suggestions from those responding with neutral answers included the application of CBT to other subject courses as well as the use of the Internet in testing. In addition, some basic computer knowledge should be a prerequisite for CBT test-takers.

Conclusions

Three computer-related variables have been explored either on the issue of their definitions and constructs or how to quantify them. Those three variables are

computer attitudes (Loyd and Gressard, 1984; Kay, 1993; Woodrow, 1994; Selwin, 1997), computer anxiety (Heinssen et al., 1987; Rosen et al., 1993; Rosen and Weil, 1995b; Bradley and Russell, 1997; Levine and Donitsa-Schmidt, 1998; Chua et al., 1999), and computer familiarity (Weil and Rosen, 1995; Nash and Moroz, 1997; Karsten and Roth, 1998; Smith et al., 1999).

When computers were proposed for use in language testing, many researchers first focused their studies on the test score comparability of the computerized and paper-and-pencil tests (Mead and Drasgow, 1993; Young et al., 1996; Neuman and Baydoun, 1998). Recently, many studies on computerized language testing have further explored the three computer-related variables (Chou, 2001; Liaw, 2002; Gaudron and Vignoli, 2002; Beckers and Schmidt, 2003; Gordon et al., 2003; Mizrachi and Shoham, 2004; Oosterweget et al., 2004; Shaft et al., 2004; Stricker et al., 2004; Noyes and Garland, 2005).

The results of previous studies indicated that these three computer-related variables were significantly correlated among themselves (Maurer, 1994; Whitley, 1997; Busch, 1995; Chua et al., 1999; Yang et al., 1999; Bozionelos, 2001a; Becker and Schmidt, 2003; Mizrachi and Shoham, 2004; Wilfong, 2004). Furthermore, some studies also confirmed significant correlations between the three variables and the test-takers' performances (Lee, 1986; Russell, 1999; Chou; 2001).

The findings of this study have added more evidence to the previous findings of research studies in that there are significant relationships among the three variables, specifically among the students of high, low, and combined language ability groups. Furthermore, computer attitudes and computer anxiety were found to be significantly correlated with Reading Comprehension Computer-Based Test (RC-CBT) scores of students with all levels of language ability. Computer familiarity significantly correlated with RC-CBT scores of students of average and low language ability groups. It was also found to be the only significant predictor of RC-CBT scores of students of the average language ability group. The other predictor identified in this study was computer attitudes which was found to be a significant predictor of RC-CBT scores of students of high and combined language ability groups.

The findings also provided further evidence that the use of computer-based tests was much preferred by the informants. The advantages of CBT were also mentioned by the participants.

Even though this dissertation yields some significant results, it is far from conclusive. There are some limitations in generalizing the results of this study. Some of them include (a) Only four variables were studied, (b) Students from one university was examined, (c) Only one format of the test was employed in this study, and (d) The sample was relatively small.

The current study is limited to only three predictor variables. There might be other significant independent variables which in combination can explain more of the variance in the dependent variable. In addition, generalizing to other types of CBT tests is somewhat problematic as only one type of CBT i.e. reading comprehension was examined in this study.

In order to compare the results of this study to other sample groups, a broader and increased variety of sample groups must first be established. However, the sample of this study is limited to just a group of fourth-year students who studied at the Faculty of Communication Arts of Dhurakij Pundit University, Bangkok, Thailand. Studies conducted with different groups of students in different settings may lead to different effects. Therefore, generalization of the findings of this study to other sample groups or other settings is problematic.

The computerized test used as an instrument for collecting the data in this study is a multiple-choice linear computerized test. It does not claim to generalize to other formats or modes of testing.

Finally, the sample size is also somewhat limited in the study. Although the sample number which consists of 90 students, 30 in each group, is an acceptable number, an additional number of students in the sample under investigation would help address the issue.

Implications

Since computer-based tests have been introduced, it appears that many universities will implement this mode of testing to their computer laboratories in the future. The findings about the computer-related variables of language test-takers of

the present study have important implications for language testing, especially in the implementation of computerized English language tests in Thailand.

1. The fact that the findings of this study indicate significant correlations between the three test-takers' variables and the CBT performances, it is important that test developers and language instructors need to be aware of those variables if the CBT tests are to be employed. Universities that employ CBT or intend to employ it in the future should keep people informed about these potential threats. Group discussions, seminars, or conferences concerning the use of the CBT should be held prior to the implementation to raise awareness among people concerned. The events held should involve a two-way communication in which the participants can give their feedback or ask questions.

2. Thai university language instructors, proctors, and other people who are involved with language teaching and testing need to prepare themselves for the coming of the CBT tests. They should gain more knowledge about computerized tests as well as information about test-takers' variables. Courses in developing the CBT should be provided for test writers and language instructors. Trial periods should also be allowed prior to the implementation of the CBT to ensure smooth transition between the two modes of testing.

3. Students also need to prepare themselves for the coming of the CBT. They should at least have some fundamental computer knowledge and possess some basic computer skills. They might ask their instructors to suggest some basic computer training programs or courses that promote hands-on learning, give active learning experience, and provide opportunities for feedback, and supportive instruction. For students with some computer experience they should find and try-out different language applications that suit their own interests and learning styles and if possible they should try out different types of computer-based tests.

4. Positive attitudes toward computers among students should be strengthened. Introducing the advantages of the computer and CBT application features to students may increase their positive attitudes. Training on basic computer knowledge and skills to enhance their computer literacy should be provided to students who have no or little computer background. Educational computer programs should be introduced into the curricula and the usefulness of the

applications should be clearly demonstrated. However, assistance should be provided to gradually learn how to use the computers at their own pace and for them to realize the advantages of computers and applications.

5. To encourage computer use and elevate computer familiarity, students should be provided with a comprehensive array of utilities with multifaceted modes and means of computer applications. Some educational institutions might require students to purchase a personal computer upon enrollment, while other institutions might just try to provide sufficient numbers of computer sets at various convenient access points in their institutions. Furthermore, students should be encouraged to familiarize themselves with the computer-based tests. By doing all of the above, students may gain greater computer familiarity and reduce their anxiety.

In summary, all people concerned with language testing should be aware of this coming mode of testing and should prepare themselves in order to be ready for this relatively new way of language assessment. The following section provides some recommendations for future research.

Recommendations for Future Studies

The impact of test-takers' variables on computer-based test performances is the focus of this study. However, more research studies need to be carried out to substantiate the implications of the findings of this project.

1. The Computer Attitudes, Familiarity, and Anxiety Rating Scale (CAFARS) was constructed to measure three computer-related variables. This rating scale consisting of 30 items is relatively concise. The validity and reliability were conducted before testing the hypotheses. Future studies may replicate this study by using this tool to collect the data of the three variables. However, there should be some adjustments on the definitions and constructs of the tools. This can be done easily because their constructs are clearly specified in this study.

2. Since this study includes a limited scope and size of the sample, the results can not be generalized to a wider population. Therefore, future studies should extend the scope and size of the sample. For example, students across study disciplines in public and private universities in Bangkok or rural areas of Thailand should be investigated.

3. For research replicable purposes, though it is said that proficiency tests are significantly correlated with achievement tests, the grouping of the subjects based on their language ability using reading comprehension proficiency tests may yield more valid results.

4. Another method of conducting research studies is to explore other potentially important individual differences. Since the findings of this study are limited to the selected three independent variables, it is likely that there are other factors which are related to the CBT performance. Other methods of investigation like an in-depth interview might be employed to trace other potential variables. This can give a better equation in predicting the CBT performance of the test-takers.

5. As the future generations of computer-based tests will be significantly be changed; for example, TOEFL will employ the Internet as their new test delivery channel, more studies are needed to investigate test-takers' variables which can affect the test scores.

6. The causal relationship analysis will provide useful information for better understanding of the cause-effect relationship between the computer-related variables and the computer-based test scores.