Integrating Cognitive-Motivational Strategies Into Multimedia-Based English Instruction for Low-Achievers

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Abstract. This study investigated whether integrating cognive-motivational strategies into multimedia-based English instruction could improve low-achievers' academic performance in grammar comprehension and reading comprehension. Forty-four students participated in this study for five weeks. They were all in the same class and under the same instruction and classified as high achievers and low achievers based on their English proficiency test scores. An interactive multimedia environment constructed with the integration of cognitive-motivational CALL model (CMMCALL) was developed according to language learning theories and the findings from the literature review. The effect of the CMMCALL on learners was examined after the experiment by comparing the learning outcome between pre-test and post-test. Comprehension tests and questionnaires were used to investigate students' learning performance and their perceptions of the CMMCALL. The results showed that the CMMCALL was able to benefit low-achievers and to increase their success of language learning, and the difference between pre-test and post-test was significantly different ($p < .05$). Their viewpoints and suggestions about using the CMMCALL program were positive and encouraging.

Keywords: cognitive-motivational strategies, multimedia-based English instruction, low-achievers, CALL.

1. Introduction

Keller (1979) believed that external conditions could be successfully constructed to facilitate and increase learner motivation. Keller (1987) integrated several learning theories and developed the ARCS (Attention, Relevance, Confidence, and Satisfaction) model, which has drawn much attention in the area of instructional design due to its systematic approach to influencing learner motivation by including the external condition within instruction (Chang & Lehman, 2002).

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Multimedia and Internet technology have become popular distribution channels for information delivery (Mayer, 2005). Students were more motivated and liked working with the computer-based instruction when learning from a multimedia program (e.g., Chang & Lehman, 2002; Puerto, Dominguez, Vaca, & Sanchez, 2010). Learning programs, instructionally designed to help learners become self-directive, active and exploratory, are key issues for educators (Chang & Lehman, 2002).

Strategy application could be a powerful approach to foster learners' learning (Dole, Duffy, Roehler, & Pearson, 1991). The use of strategies help students develop the ability to become aware of their own knowledge construction process, which facilitates cognitive growth and leads to better learning achievement (Chang, 2005). The strategy instruction should be direct and explicit, giving conditional metacognitive knowledge about when and how to use a strategy (Pressley, Snyder, & Cariglia-Bull, 1987).

To date, some of the studies regarding strategy application focus on investigating what kinds of strategies students tend to use in learning (e.g., Chang, 2005), while some focus on applying instructional strategies to instruction (e.g., Chang, 2005). Few studies applying the integration of cognitive-motivational model in multimedia assisted language learning for low-achievers have been reported.

This study examined the effect of the cognitive-motivational multimedia CALL on grammar learning. Two research questions guided this study:

- Did low-achievers benefit from the cognitive-motivational multimedia CALL on grammar learning?
- What are low-achievers' perceptions of the cognitive-motivational multimedia CALL?

2. Method

A cognitive-motivational multimedia CALL (CMMCALL) platform which consists of elements including attention, relevance (motivational aspect) and selecting and integrating (cognitive aspect) guided the instructional materials design. To validate the content and the embedded strategies, five English majors and five English non-English majors were invited to try the instructional materials. Feedback from the students was used as the reference for editing and revising the instructional materials.

2.1. Experimental design

This is a quasi-experimental study. The treatment was the use of the CMMCALL and the dependent variables were the scores of grammar tests and reading comprehension tests. The experimental design of this study is shown in Table 1.

Table 1. Quasi-experimental research design

Week 1	Week 2 – week 6	Week 7
O_1 (pre-test)	X (CMMCALL practice)	O_2 (post-test)

2.2. Subjects and setting

Forty-four students aged 19 to 20 participated in this study for five weeks. They were all in the same class and under the same instruction and classified as high achievers and low achievers based on their English proficiency test score.

2.3. Instruments

The instruments used in this study include an English proficiency test, a CMMCALL program, a content-based academic performance test, and a self-reported questionnaire to investigate students' perception of CMMCALL and the attitude towards using CMMCALL. These instruments are described as follows.

2.3.1. The cognitive-motivational multimedia CALL

The interactive cognitive-motivational multimedia CALL provides a learning environment that allows students to choose the learning time and control the pace and the sequencing of instructional events. The course is content-based in nature and Figure 1 shows a sample page of the CMMCALL.

Figure 1. A screenshot of the CMMCALL program

2.3.2. English proficiency test

The General English Proficiency Test (GEPT) with 50 multiple choices questions was used to verify students' English proficiency level. Based on the results of the test, students were classified as either high achievers or low achievers.

2.3.3. Academic performance tests

Content-based comprehension tests including grammar-based sentence patterns, practice questions and reading comprehension questions, were used to evaluate students' learning achievement before and after the use of CMMCALL.

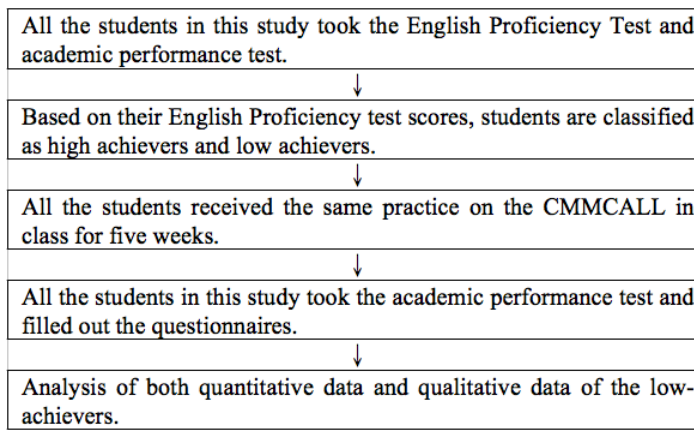
2.3.4. Questionnaires

The attitude survey was designed by the researchers in order to examine students' attitudes and opinions of the CMMCALL. The questionnaire contained open-ended questions to encourage students to talk about the afterthoughts of using CMMCALL.

2.4. Procedures

At the beginning of the semester, students in a freshman English class were recruited as the subjects in this study. All the students learned from the same instructor and under the same instruction when learning from CMMCALL. Figure 2 shows the procedure of the study.

Figure 2. Flowchart of research procedure



3. Data analysis and results

3.1. Students' scores of academic performance tests

A t-test was used to compare students' academic performance before and after the use of the CMMCALL. Table 2 shows the results of the academic performance for low achievers before and after the experiment. The mean score of the academic performance test 1(the pre-test) was significantly different from the mean score of the academic performance test 2 (the post-test). The mean score of the post-test was significantly higher than the mean score of the pre-test (p = .003).

Table 2. t-test for scores of academic performance test between pre-test and post-test for low achievers

	n	M	SD	t	*p.*
pre-test	11	55.09	8.69	3.845*	.003
post-test	11	65.09	10.17		

3.2. Low-achievers' perception of the CMMCALL program

In terms of low-achievers' perception of the CMMCALL program, 89.5% of the students affirmed the effectiveness of the program; most students (81%) indicated that they found the integration part helped them have clearer concepts of grammar and became more familiar with the sentence patterns and grammar use. Among three different tenses, 89.4% of the students claimed that after learning from this program, they understood better about present tense and were able to put it into practice. More than 77% of the students indicated that they recognized the past tense better and 72% of the students claimed that the program helped them better comprehend future tense. Data from open-ended questions were sorted into three categories: benefits, limitations and suggestions.

4. Discussion and conclusions

The study has yielded both quantitative and qualitative data in support of using the CMMCALL program. Based on the quantitative data, the difference between the pre-test score mean and post-test score mean in terms of the academic performance tests for the low-achievers was statistically significant. The results indicated that the CMMCALL program benefited lower-achievers' learning performance and coincided with previous research which reported that strategy application could be a powerful approach to foster learners' learning (Dole et al., 1991). With the use of strategies, students are able to develop the ability to become aware of their own knowledge construction process, which according to Chang (2005), facilitates cognitive growth and leads to better learning achievement.

In terms of the qualitative data, the positive findings resulting from the questionnaire also provide a promising perspective of the CMMCALL program in language instruction. As Mayer (2005) noted, multimedia and Internet technology have become a popular distribution channel for information delivery. Students were more motivated and liked working with the computer-based instruction when learning from a multimedia program (e.g., Chang & Lehman, 2002; Puerto et al, 2010). Learners' positive responses suggest that the CMMCALL program is a useful tool for language teachers to be applied in language classes.

References

Chang, M. M. (2005). Applying self-regulated learning strategies in a web-based instruction- An investigation of motivation perception. *Computer Assisted Language Learning, 18*(3), 217-230.

Chang, M. M., & Lehman, J. D. (2002). Learning foreign language through an interactive multimedia program: An experimental study on the effects of the relevance component of the ARCS model. *The CALICO Journal*, *20*(1), 81-89.

Dole, J. A., Duffy, G. G., Roehler, L. R., & Pearson, P. D. (1991). Moving from the old to the new: research on reading comprehension instruction. *Review of Educational Research, 61*(2), 239-264.

Keller, J. M. (1979). Motivation and instructional design: A theoretical perspective. *Journal of Instructional Development, 2*(4), 26-34.

Keller, J. M. (1987). Development and use of the ARCS model of instructional design. *Journal of Instructional Development, 10*(3), 2-10.

Mayer, R. E. (2005). *The Cambridge Handbook of Multimedia Learning.* New York: Cambridge University Press.

Pressley, M., Snyder, B. L., & Cariglia-Bull, T. (1987). How can good strategy use be taught to children? Evaluation of six alternative approaches. In S. Cormier & J. Hagman (Eds.), *Transfer of learning: Contemporary research and applications* (pp. 81-120). Orlando, FL: Academic Press.

Puerto, G. D., Dominguez, E. M., Vaca, J. M., & Sanchez, H. (2010). Language multimedia blended courses as motivation-enhancers for immigrant students. *Selected paper of Motivation and Beyond, Fourteenth International CALL Conference Proceedings* (pp. 66-69).

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