Malaysian Journal Of ELT Research

ISSN: 1511-8002

Vol. 7 (1), 2011

Metacognitive strategy training through the cognitive academic language learning approach (CALLA) as a way to improve reading comprehension performance among students of an English language course at UiTM Penang

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Abstract

The use of learning strategies has an immense effect on students' learning progress, where different students are accustomed to the use of different learning strategies. While one strategy may work well for one student, the same strategy may not be as effective for another. Among these, metacognitive strategies (MCS) are considered to be the most important as they oversee the execution of the other skills during the learning process. There are many ways students can be trained to master the MCS. The researchers propose the cognitive academic language learning approach (CALLA) as a strategy training approach for this purpose. The aim of this study was to gauge whether CALLA as an

instructional strategy in training students' MCS helps to improve their reading comprehension performance. A quasi-experimental design was utilised using non-equivalent groups to compare the performance of both the control (n=32) and experimental groups (n=33). Results obtained showed that the group that received training through CALLA showed better use of the MCS, thus improving their reading comprehension performance in the post test. It can therefore be concluded that the use of CALLA as an instructional strategy does aid towards improved performance in language learning, particularly in reading comprehension. It is recommended that teachers consider the use of CALLA as a teaching option for students in their classes. However, the actual impact of this approach needs to be compared back-to-back with other similar approaches first to ascertain its effectiveness, besides taking into account the students' motivation and anxiety level towards language learning itself.

KEYWORDS: Metacognitive strategies, strategy instruction, CALLA, reading comprehension

Introduction

Reading comprehension has been defined by the RAND Reading Study Group (RRSG) of California (2002) as the process of simultaneously extracting and constructing meaning through interaction and involvement with written language. It comprises the elements of the *reader*, the *text* and the *activity or purpose* for reading. Meanwhile, Flavell (1976) has described metacognition as one's knowledge concerning one's own cognitive processes or anything related to them, e.g., the learning-relevant properties of information or data. Vandergrift (2002) emphasises the essential role of metacognitive strategies, saying that "metacognitive strategies are crucial because they oversee, regulate, or direct the language learning task, and involve thinking about the learning process." Thus, in reading comprehension lessons, the use of metacognitive strategies would be to plan, monitor and evaluate actions that will effectively help readers to successfully negotiate meaning pertaining to the reading text itself.

At UiTM Penang, English language courses are of two types: proficiency and specific purpose courses. At the diploma level, beginner students enroll for the basic proficiency courses such as BEL120, BEL130 and BEL 260, while at a later stage diploma students are exposed to BEL311 and degree students register for ESP courses such as BEL411, BEL422, BEL420 and the like. In all these courses, the reading component is an essential part of the course. Unfortunately, as Rasaya and Elangkeeran (2007) have pointed out, the students perceive these English language courses as very difficult and find it extremely difficult to cope with the learning tasks.

By and large, students find it difficult to perform satisfactorily in the English language courses at UiTM because of a lack of proficiency in the language due to a poor foundation in the language from their schooling years. This is further compounded by the fact that they do not possess appropriate learning strategies when it comes to language learning, and they ought to be trained in this area. The teaching of these strategies has to be made explicit as, according to Nunan (1991), the primary purpose of instruction is to raise learners' awareness of strategies and then allow each to select appropriate strategies to accomplish their learning goals. In this respect, the cognitive academic language learning approach (CALLA) is one approach that can be used in ESL, EFL, bilingual, foreign language, and general education classrooms (Chamot & Robbins, 2005).

In view of the above, with regard to UiTM students' language learning difficulties, it is the aim of this study to determine whether CALLA could be utilised to alleviate the students' lack of language learning strategy awareness and application problems.

Objectives

The objectives of this study are to find out whether:

i. the use of the cognitive academic language learning approach (CALLA) improves the students' mastery of metacognitive strategies;

ii. students show improved performance in their reading comprehension with the use of metacognitive strategies after cognitive academic language learning approach (CALLA) training.

Literature Review

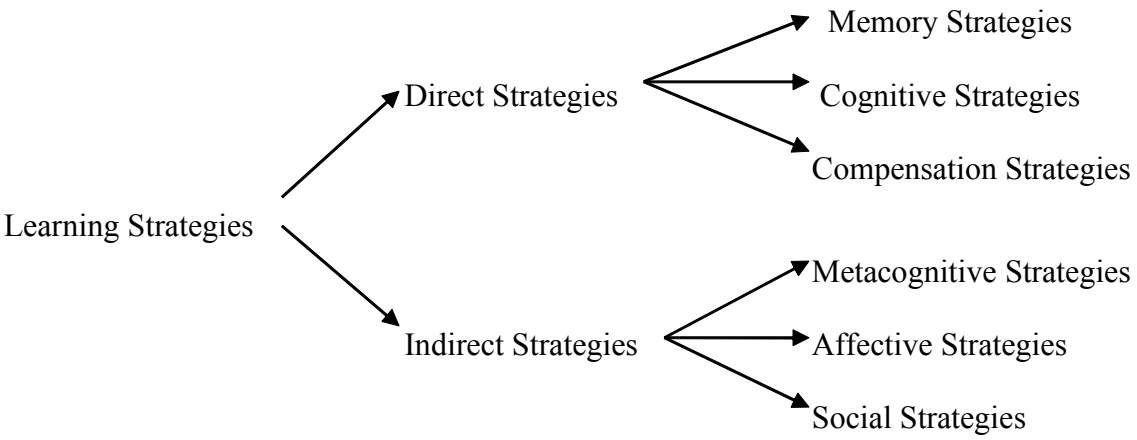
Metacognitive strategy as a learning strategy

During the past two decades, more emphasis has been placed on cognitive process-oriented strategy instruction, and the arrangement and selection of strategy instruction have been growing in diversity (Dole et al, 1991, as cited in Sung, Chang, & Huang, 2007). Metacognition, also a cognitive process, has been divided by Flavell (1978) into three categories: knowledge of person variables, task variables and strategy variables.

Carrell, Gajdusek, and Wise (1998) say that one reason metacognition is significant is that if learners are not aware of when their comprehension is breaking down and what they can do about it, strategies introduced by the teacher will fail. This explains clearly the need for students to take on the self-monitoring of their own thought process when engaged in a learning task. In other words, metacognitive strategies involve the processes of thinking about learning, planning for learning, monitoring of comprehension or production while it is taking place, and self-evaluation after the learning activities have been completed (Gallo-Crail & Zerwekh, 2002).

Oxford (1990) views learning strategies as "specific actions taken by the learner to make learning easier, faster, more enjoyable, more self directed, more effective, and more transferable to new situations." These strategies are first divided into two main classes - direct and indirect, with each class comprising three strategy groups (refer to Figure 1). Oxford (1996) also argues that a greater emphasis should be placed on identifying effective language learning strategies and on teaching students how to use them successfully. One of the reasons why students should be trained in using strategies is to enable and empower them to employ these strategies to become autonomous learners.

Figure 1. Direct and indirect strategies (Oxford, 1990)



According to Lam (2008), metacognitive strategies, which involve thinking about the learning process, are not task-specific and hence can be applicable to different types of learning tasks. For Guterman (2003), metacognition, meta-comprehension, meta-linguistics and metacognitive awareness are crucial to the issue of activating the learner's schemata. Basically, these assume that the reader is aware of the various factors involved in the learning situation, such as the characteristics of the text, the requirements of the task, applicable strategies and the learner's own abilities and deficiencies, is aware of different kinds of prior knowledge, is aware that different kinds of prior knowledge can and need to be used in the attempt to learn and construct meaning, is aware that using this prior knowledge and background will affect the ability to learn from reading and will affect learning performance, and also is able to use this prior knowledge consciously. The concepts of zone of proximal development (ZPD) and scaffolding as postulated by

Vygotsky is an essential aspect in cognitive development as it perceives the individual as an active agent in his or her own cognitive development (Guterman, 2003). This is especially true if we want our students to become autonomous learners.

Anderson (2002) has further defined the metacognitive process as simply "thinking about thinking" and "the ability to make one's thinking visible." It is also the ability to reflect on what you know and do, and what you do not know and do not do, according to him. Vandergrift (2002) also emphasises the essential role of metacognitive strategies. To him, "metacognitive strategies are crucial because they oversee, regulate, or direct the language learning task, and involve thinking about the learning process." O'Malley and Chamot (1990) further stress the importance of the role of metacognitive strategies in learning when they state that "students without metacognitive approaches are essentially learners without direction or opportunity to plan their learning, monitor their progress, or review their accomplishments and future learning directions." Learners need to be metacognitively aware of what they are doing. They need to connect their strategies for learning while engaged in an online learning task with their purpose for being online and this awareness results in strong metacognitive strategies. Metacognition also results in critical but healthy reflection and evaluation of a learner's thinking that may result in making specific changes in how he learns.

Metacognition is also not simply recapitulating an event and describing what had happened and what your feelings about it were. According to Anderson (2002), metacognition in language learning can be divided into five main components: (1) preparing and planning for effective reading, (2) deciding when to use particular reading strategies, (3) knowing how to monitor reading strategy use, (4) learning how to orchestrate various reading strategies, and (5) evaluating reading strategy use. It is important to be reminded that metacognition is not any one of the five elements in isolation. On the contrary, each of these five metacognitive skills interacts with each other. Metacognition is also not a linear process that moves from the first stage through to the final stage of evaluation. It may take a combination of more than one metacognitive process at a given time to be effective during a learning task.

The use of CALLA as a learning strategy

The CALLA model is recursive and this allows teachers and students to have the flexibility to revisit prior instructional phases as needed (Chamot, 2004), and its principal objectives are to assist students in the following ways (Chamot & Robbins, 2005):

i. To value their own prior knowledge and cultural experiences, and relate this knowledge to academic learning in a new language and culture

ii. To learn the content knowledge and the language skills that are most important for their future academic success

iii. To develop language awareness and critical literacy

iv. To select and use appropriate learning strategies and study skills that will develop academic knowledge and processes

v. To develop abilities to work successfully with others in a social context

vi. To learn through hands-on, inquiry-based, and cooperative learning tasks

vii. To increase motivation for academic learning and confidence in their ability to be successful in school

viii. To evaluate their own learning and planning to become more effective and independent learners.

The Cognitive Academic Language Learning Approach (CALLA) model of teaching learning strategy developed by Chamot (2005) includes six (6) phases:

Phase 1 - Preparation

Teacher identifies students' current learning strategies for familiar tasks.

Phase 2 – Presentation

Teacher models, names and explains new strategy; asks students if and how they have used it.

Phase 3 - Practice

Students practice new strategy; in subsequent strategy practice, teacher decreases reminders to encourage independent strategy use.

Phase 4 – Self-evaluation

Students evaluate their own strategy use immediately after practice.

Phase 5 – Expansion

Students transfer strategies to new tasks, combine strategies into clusters, develop a repertoire of preferred strategies.

Phase 6 – Assessment

Teacher assesses students' use of strategies and its impact on performance.

Research Methodology

Research hypotheses

1.1.1 There is no significant difference in the mastery level of the metacognitive strategies of the students of the experimental group before and after undergoing CALLA training (H_o^1).

1.1.2 There is no significant difference in the mastery level of the metacognitive strategies of the students between the control group (traditional exposure) and the experimental group (CALLA training) (H_o^2).

1.1.3 There is no significant difference in the reading comprehension performance of the students of the experimental group before and after undergoing CALLA training (H_o^3).

1.1.4 There is no significant difference in the reading comprehension performance of the students between the control group (traditional exposure) and the experimental group (CALLA training) (H_o^4).

Sample

BEL260 (Intermediate English) is an English language proficiency course run over one semester and taken by part two students of the diploma programme at all the UiTM campuses. The course content is very similar to that of the Malaysian University English Test (MUET) and is a way of preparing the students for MUET. In any one semester

about 1000 students register for the BEL260 course. The research population was homogenous in nature as they were all ethnic Malays and come from middle and lower income families. Their English language proficiency can be classified as average to below average. Exposure to the language is also mostly limited to in-class usage. For the purpose of this research, two intact groups taught by the researcher were selected, taking into account the convenience and practicality of research implementation. The experimental and the control groups comprised 33 and 32 students respectively.

Instruments

MARSI

The Metacognitive Awareness of Reading Strategies Inventory (MARSI) was developed by Kouider Mokhtari and Carla A. Reichard of Oklahoma State University (Mokhtari and Reichard, 2002) to assess adolescent and adult readers' metacognitive awareness and perceived use of reading strategies while reading academic or school related materials. This self-report instrument comprises three strategy subscales or factors, namely: Global Reading Strategies, Problem-Solving Strategies, and Support Reading Strategies. The first factor, Global Reading Strategies, contains 13 items and represents a set of reading strategies oriented toward a global analysis of text. The second factor, Problem-Solving Strategies, contains 8 items that appear to be oriented around strategies for solving problems when text becomes difficult to read. The third factor, Support Reading

Strategies, contains 9 items and primarily involves use of outside reference materials, taking notes, and other practical strategies that might be described as functional or support strategies. Total reliability for all the items was 0.89, while reliability for Global Reading Strategies was 0.92, for Problem-Solving Strategies was 0.79, and for Support Reading Strategies was 0.87.

The same instrument was tested at UiTM Penang and returned a Cronbach's alpha reliability coefficient of 0.92 for all the items, while for Global Reading Strategies it was 0.85, for Problem-Solving Strategies it was 0.76, and for Support Reading Strategies it was also 0.76.

Therefore, it can be safely concluded that the MARSI instrument is a reliable tool to assess the metacognitive awareness of reading strategies among the students of UiTM Penang.

The *Global Reading Strategies* subscale:

These strategies can be thought of as generalized, intentional reading strategies aimed at setting the stage for the reading act (e.g., setting purpose for reading, making predictions).

The *Problem-Solving Strategies* subscale:

These strategies provide readers with action plans that allow them to navigate through text skillfully. Such strategies are localized, focused problem-solving or repair strategies used when problems develop in understanding textual information (e.g., checking understanding on encountering conflicting information or rereading for better understanding).

The *Support Reading Strategies* subscale:

Strategies such as these serve a useful function for some of the students who seem to invoke them as needed. These strategies provide support mechanisms aimed at sustaining responses to reading (e.g., use of reference materials such as dictionaries and other support systems).

These three types of strategies (i.e., Global, Problem-Solving, and Support Strategies) interact with each other and have an important influence on text comprehension.

Pre and post test instrument

Both the experimental (n=33) and control groups (n=32) were subjected to the same pretest and post test materials. Two similar reading passages were used as the pretest and post test instruments. Both were about 450 – 500 words in length and were of the expository genre and of intermediate difficulty level. They were adapted from reading passages that were administered during the BEL260 final examination in previous semesters.

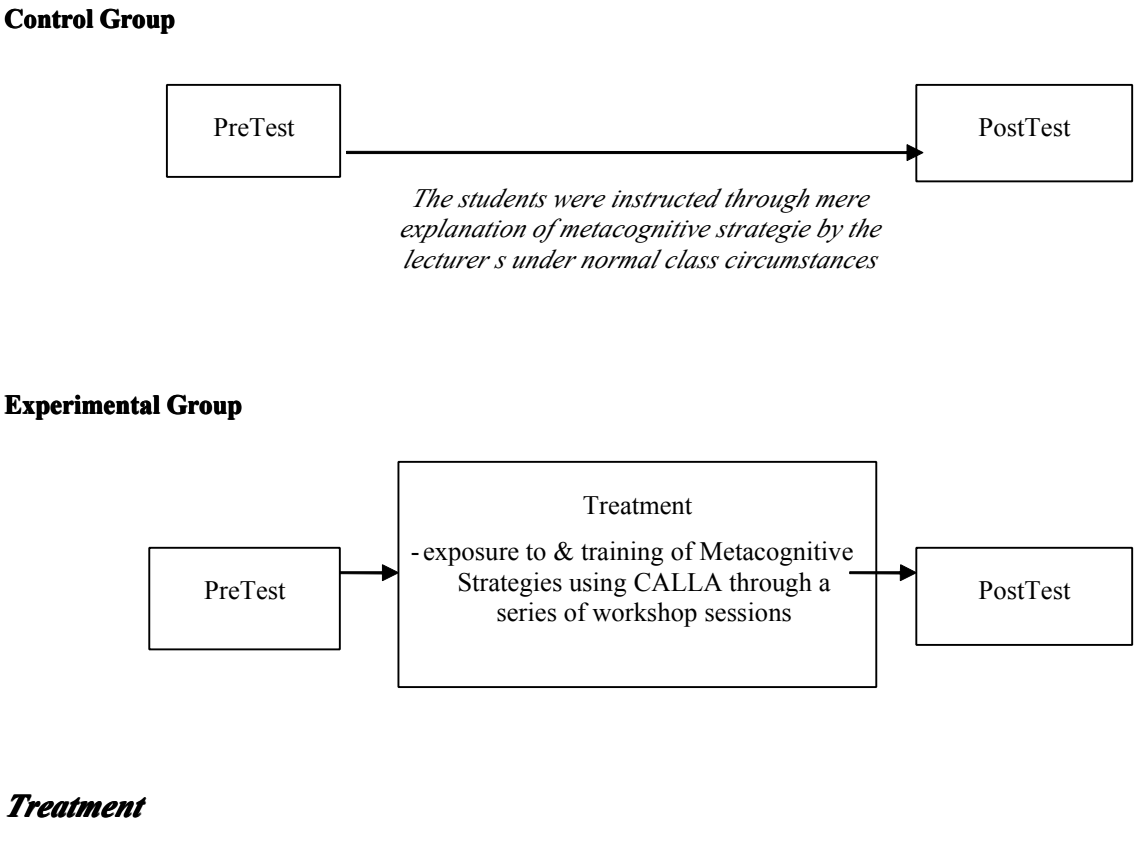
Each reading passage was followed by nine questions, each with its own subsections. The questions tested the students on the following reading sub-skills: previewing, skimming and scanning, deriving meaning of words from context, understanding sense relationships, distinguishing between main ideas and supporting details, distinguishing fact from opinion, making inferences, making predictions, putting forward hypothesis, drawing conclusions, analysing and evaluating reading texts, interpreting the writer's point of view, attitudes or intentions, interpreting linear and non-linear texts, making judgements, distinguishing the relevant from the irrelevant and summarising information.

Research design

The design of this study was quasi experimental, comprising cohorts of two intact groups of students from the aforementioned population: the control group and the experimental group (refer to Figure 2). Both the groups were subjected to the same pretest and post test

instruments. While the experimental group was subjected to the treatment phase using the CALLA method (refer to Section 4.5 below), the control group was only taught by the researcher using the 'existing' strategy instruction method, loosely termed the traditional strategy instruction method in which the strategies to be used were merely explained to the students by the lecturer. In contrast, the experimental group went through a more rigid and structured metacognitive strategy instruction phase using CALLA. Otherwise, all other variables remained the same between these two groups.

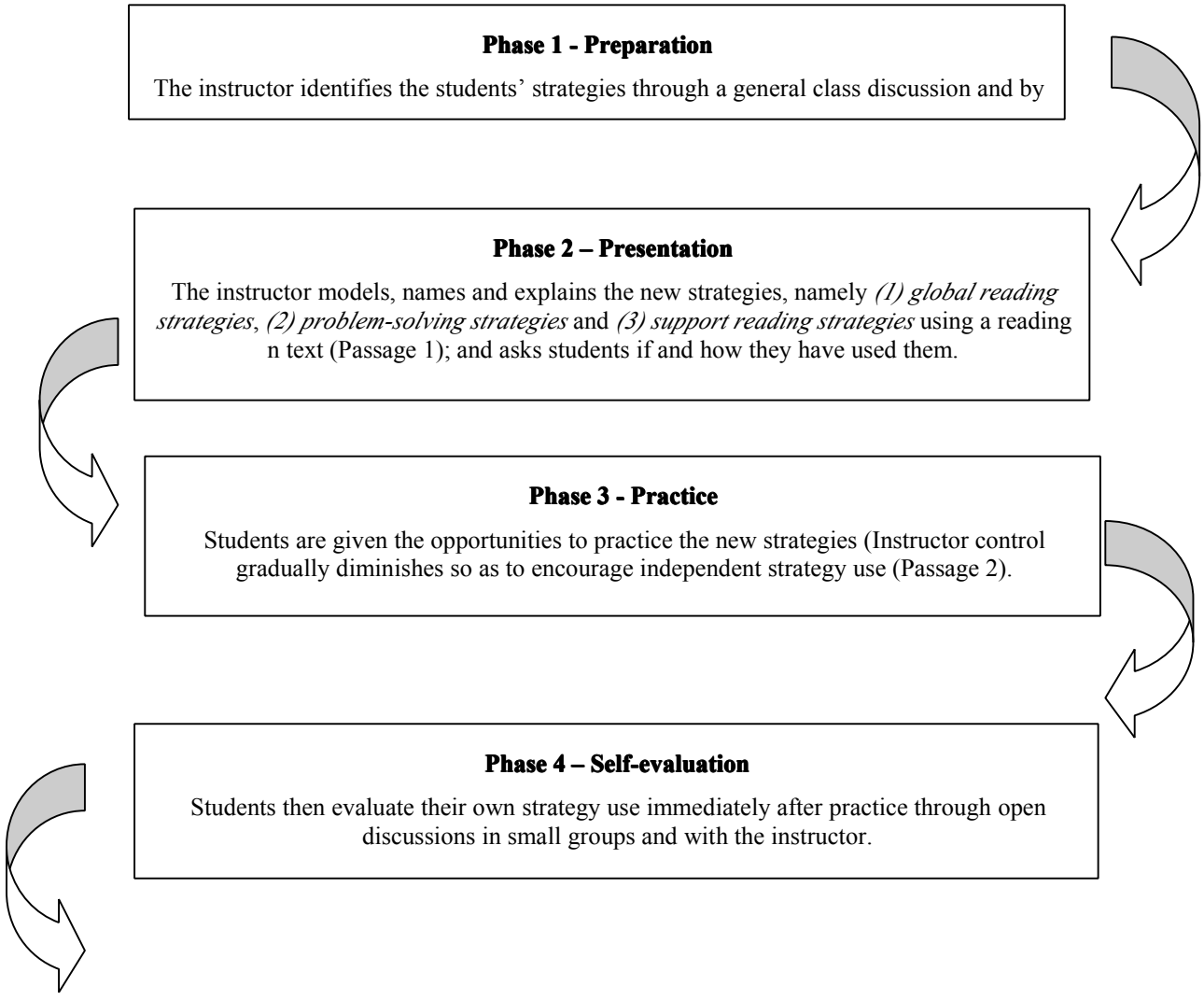
Figure 2. The research design for the study

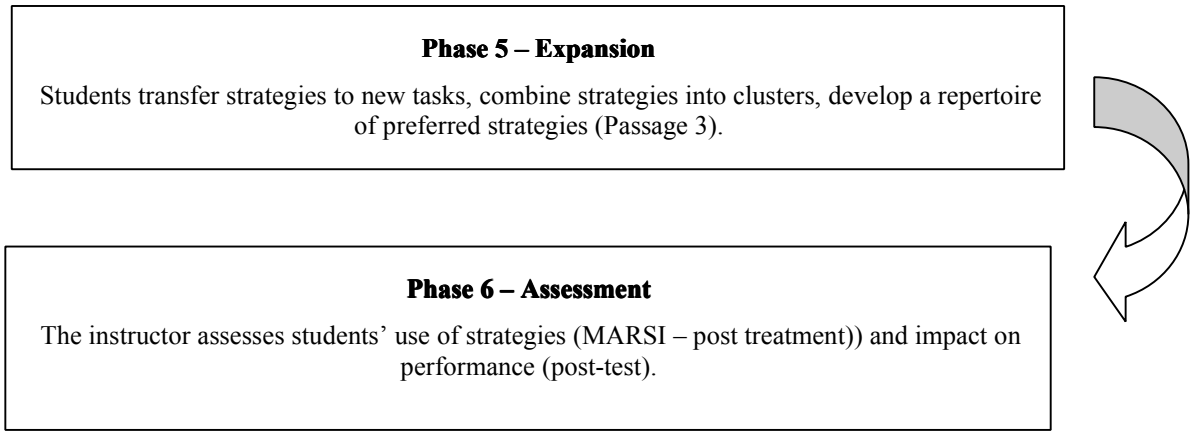


Treatment

A series of workshop sessions were conducted to train the students in mastery of metacognitive strategies in their reading comprehension lessons. The training was based on Chamot's (2005) Cognitive Academic Language Learning Approach (CALLA) model of teaching learning strategies which includes six phases. However, some adaptation was made to the actual CALLA technique by Chamot (2005) so as to suit the researcher's study requirements. The adapted CALLA design is presented below:

Figure 3. The CALLA model (Chamot, 2005) as adapted for this study





Analysis

Two types of statistical analyses using the SPSS version 16.0 were conducted to gain descriptive and inferential statistical in order to test the hypotheses for this research. The t-test for paired samples was used to test hypothesis 1 (H_o^1) and hypothesis 3 (H_o^3), while the t-test for independent samples was used to test hypothesis 1 (H_o^2) and hypothesis 3 (H_o^4).

Findings

Metacognitive awareness of reading strategy inventory (MARSI) by Mokhtari and Reichard (2002)

Performance of the control group

The mean score for MARSI for the control group (n=32) before traditional training of metacognitive strategies was 112.31 (sd=2.73) while after the traditional training it was 112.91 (sd=2.77). The repeated measures t-test performed on the MARSI returned the following result [$t(31) = -1.518$; $p>0.05$]. This means that there was no significant difference in the mean for the metacognitive reading strategy awareness for the control group before and after traditional metacognitive training.

Performance of the experimental group

The mean score for MARSI for the experimental group (n=33) before CALLA training was 110.85 (sd=12.02) while after CALLA training it was 121.21 (sd=10.11). The repeated measures t-test performed on the MARSI returned the following result [$t(32)=-13.486$; $p<0.05$]. This means that there was a significant difference in the mean for the metacognitive reading strategy awareness for the experimental group before and after CALLA training. Therefore, the null hypothesis that there is no significant difference in the mastery level of the metacognitive strategies of the students of the experimental group before and after undergoing CALLA training (H_o^1) is rejected.

Performance of the control and experimental groups before any form of treatment

The mean score for MARSI for the control group (n=32) was 112.31 (sd=15.43) while the mean score for MARSI for the experimental group (n=33) was 110.85 (sd=12.02) before any form of treatment. The independent measures t-test performed on the MARSI returned the following result: [t (63) =-0.428; p>0.05]. This means that there was no significant difference in the mean for metacognition reading strategy awareness between the control and experimental groups before the treatment stage.

For the subscales, the results were as shown below:

Global reading strategies

The mean score for the control group (n=32) was 48.66 (sd=6.91) while the mean score for the experimental group (n=33) was 47.27 (sd=5.67). The independent measures t-test performed on the MARSI returned the following result: [t (63) =0.883; p>0.05]. This means that there was no significant difference in the mean for global reading strategies between the control and experimental groups before any form of strategy training.

Problem-solving strategies

The mean score for the control group (n=32) was 30.81 (sd=4.50) while the mean score for the experimental group (n=33) was 31.79 (sd=3.16). The independent measures t-test performed on the MARSI returned the following result: [t (63) =-1.103; p>0.05]. This means that there was no significant difference in the mean for problem-solving strategies between the control and experimental groups before any form of strategy training.

Support reading strategies

The mean score for the control group (n=32) was 32.84 (sd=4.98) while the mean score for the experimental group (n=33) was 31.79 (sd=4.43). The independent measures t-test performed on the MARSI returned the following result: [t(63)=0.904; p>0.05]. This means that there was no significant difference in the mean for support reading strategies between the control and experimental groups before any form of strategy training.

Performance of the control and experimental group after treatment

The mean score for MARSI for the control group (n=32) was 112.91 (sd=15.69) after undergoing the traditional metacognitive strategy instruction while the mean score for MARSI for the experimental group (n=33) was 121.21 (sd=10.11) after undergoing

CALLA training. The independent measures t-test performed on the MARSI returned the following result [$t(63)=-2.529$; $p<0.05$]. This means that there was a significant difference in the mean for the metacognitive reading strategy awareness between the control and experimental groups after the treatment stage. Therefore, the null hypothesis that there is no significant difference in the mastery level of the metacognitive strategies of the students between the control group (traditional exposure) and the experimental group (CALLA training) after the treatment phase (H_o^2) is rejected.

For the subscales, the results were as shown below:

Global reading strategies

The mean score for the control group (n=32) was 49.06 (sd=7.03) after undergoing traditional metacognitive strategy instruction while the mean score for the experimental group (n=33) was 53.30 (sd=4.77) after undergoing CALLA training. The independent measures t-test performed returned the following result [t (54.3) =-2.837; $p<0.05$]. This means that there was a significant difference in the mean for global reading strategies between the control and experimental groups after the strategy training phase.

Problem-solving strategies

The mean score for the control group (n=32) was 30.94 (sd=4.63) after undergoing traditional metacognitive strategy instruction while the mean score for the experimental group (n=33) was 34.03 (sd=2.88) after undergoing CALLA training. The independent measures t-test performed returned the following result [$t(51.6)=-3.224$; $p<0.05$]. This means that there was a significant difference in the mean for problem-solving strategies between the control and experimental groups after the strategy training phase.

Support reading strategies

The mean score for the control group (n=32) was 32.91 (sd=4.88) after undergoing traditional metacognitive strategy instruction while the mean score for the experimental group (n=33) was 33.88 (sd=4.15) after undergoing CALLA training. The independent measures t-test performed returned the following result [$t(63)=-0.867$; $p>0.05$]. This means that there was no significant difference in the mean for support reading strategies between the control and experimental groups after the strategy training phase.

Reading comprehension performance test

Performance of the control group

The mean score for the reading comprehension pretest for the control group (n=32) before traditional training of metacognitive strategies was 63.72 (sd=10.68) while for the post test after the traditional training it was 63.59 (sd=11.0). The repeated measures t-test performed on the reading comprehension pretest and post test scores for the control group returned the following result: [$t(31)=0.661$; $p>0.05$]. This means that there was no significant difference between the mean for the reading comprehension pretest and post test scores for the control group.

Performance of the experimental group

The mean score fo ther reading comprehension pretest for the experimental group (n=33) before CALLA training was 66.76 (sd=12.79) while post test scoresafter CALLA training was 71.01 (sd=12.22). The repeated measures t-test performed on the reading comprehension pretest and post test scores for the experimental group returned the following result: [$t(32)=-9.582$; $p<0.05$]. This means that there was a significant difference between the mean for the reading comprehension pretest and post test scores for the experimental group. Therefore, the null hypothesis that there is no significant difference in the reading comprehension performance of students in the experimental group before and after undergoing CALLA training (H_o^3) is rejected.

Performance of the control and experimental group in the pretest

The mean score for the reading comprehension pretest of the control group (n=32) was 63.72 (sd=10.68) while the mean score for reading comprehension pretest of experimental group (n=33) was 66.76 (sd=12.79) before any form of treatment. The independent measures t-test performed on the reading comprehension pretest scores returned the following result: [$t(63)$=-1.038; p>0.05]. This means that there was no significant difference in the mean for the reading comprehension pretest scores between the control and experimental groups before the treatment stage.

Performance of the control and experimental group in the post test

The mean score for the reading comprehension post test of the control group (n=32) was 63.60 (sd=11.0) after traditional metacognitive strategy training while the mean score for the reading comprehension post test of the experimental group (n=33) after CALLA training was 71.01 (sd=12.22). The independent measures t-test performed on the reading comprehension post test scores returned the following result: [t (63)=-2.587; p<0.05]. This means that there was a significant difference in the mean for the reading comprehension post test scores between the control and experimental groups after the

treatment stage. Therefore, the null hypothesis that there is no significant difference in the reading comprehension performance of the students between the control group (traditional exposure) and the experimental group (CALLA training) (H_o^4) is rejected.

Discussion and conclusion

The use of strategies in reading comprehension is not just limited to its use alone. It also involves the skills of ascertaining the appropriate strategies and of organizing such strategies so that the particular learning process becomes more rewarding and serves its purpose well in a justified manner (Rasaya & Elangkeeran, 2007). In this respect, it has been found that metacognitive strategy training through CALLA results in improved performance in reading comprehension for the students.

Besides general mastery of the metacognitive strategies, students were also able to better grasp the sub-strategies of global reading strategies and problem-solving strategies while engaged in reading comprehension activities. Although the support reading strategies did not show a significant improvement through CALLA training, it is sufficient to note that such training does make a difference in students' reading comprehension. Students can be trained to use learning strategies for reading comprehension such as metacognitive strategies using a variety of different approaches. Some of these approaches are Styles

and Strategy-Based Instruction (SSBI) Model (Cohen, 1998 cited in Chamot, 2004), the model by Grenfell and Harris (1999, cited in Chamot, 2004) and so on .

A learner's knowledge and awareness of these strategies will determine the level of his or her understanding, performance and achievement (Guterman, 2003). Griffiths (2004) believes that language learning strategies are teachable and the fact that learners can benefit from coaching in learning strategies underlies much of the research in the field.

Lam's (2008) remark that "learners well versed in metacognitive strategy use are learners with direction, thereby becoming autonomous in the learning process" aptly sums up the above discussion. Hence, as teachers of these strategies, it is our duty to ensure that our learners ultimately become autonomous learners.

Although this study has positively shown that training students in the use of metacognitive strategies through CALLA can lead to better performances in their reading comprehension, the overall effectiveness of such an approach needs to be validated according to context specific settings. The effectiveness of a strategy should not only be established based on the students' test performance. There are other variables such as motivation, attitude and anxiety factors, suitability of materials used and other factors that this study did not address and these need to be explored further. Besides, this approach can also be compared back-to-back with other similar types of language learning strategy

instruction to ascertain its superiority. Tthis will certainly lend more credibility to the overall validity of this study.

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