



Teaching Learning Strategies for Subjects Teachers: Two Case Studies in Hong Kong

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Abstract

This paper first discusses the concept of learning strategies seen as organised plans of action in order to achieve deep learning. Examples of these strategies include rehearsing, summarizing, paraphrasing, imaging, elaborating, and outlining (Weinstein, 1988). An overview of the project, part of a University Grants Council funded Teaching Development Grant project, is then given. The rationale for the project is based on Chalmers and Fuller's (1996) report of their success in of the integrated approach. 20 lecturers at City University of Hong Kong went through a 3-day training workshop on the methodology of teaching learning strategies. The participating teachers then used learning strategies in their courses and have documented their experiences in case studies. The paper reports on two such case studies. The first is the experience of introducing learning strategies to a group of students in a computer programming course in the Division of Computer Studies where the focus is on training students to search for information and generate questions, teaching students how to perform tasks without previous instruction and then to teach others what they have learnt, and working collaboratively to solve tasks. The second case study uses language learning strategies taught to a group of English learners in the Division of Language Studies with the main emphasis on identifying main points, guessing unfamiliar lexis and paraphrasing. The paper concludes with elaboration of the remaining stages of the project.

Key Words

Learning strategies, learning styles, creative thinking, peer teaching, problem solving, investigative skills, language learning strategy, team work

1. Introduction

The recent constructivist view toward knowledge acquisition places greater emphasis on the role of learners in constructing their own knowledge. Learners have their own systematic way of transforming information into knowledge, and good and poor learners differ in how and how well they do this. In other words, learners employ different learning strategies when they learn. Teaching learning strategies to students is now generally thought to enhance academic success and enable life-long learning (McCombs, 1988; Gibbs 1992). However, most often learning strategies are taught in a separate course where the learning of strategies is decontextualized from the learning of subject matter, that is, it is not integrated with the learning of subject matter. Considerable research indicates that when learning strategies are taught as all-purpose skills they are not effective; however, more positive results are shown if strategy training is taught in a metacognitive, self-regulative context, in connection with specific content rather than generalized skills (McCombs, 1984; Weinstein, 1988; Garner, 1990). Denise Chalmers (University of

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Queensland) and Richard Fuller (Edith Cowan University) carried out research to determine the effectiveness of students learning strategies within their disciplines, and whether learning strategies could be taught by university teachers in the context of their coursework. Results indicate that students using these strategies use them effectively and achieve better results than students who are taught in the conventional way. Further, results indicate that teachers can, in fact, teach their own students a repertoire of skills necessary for life-long learning. The authors conclude that “Integrating instruction in learning strategies with the teaching of regular subject matter overcomes the problems of decontextualized learning of strategies ...” (Fuller et al., (1995); Chalmers & Fuller, 1999). This paper explores the concept of subject teachers teaching learning strategies in the context of their courses. After a description of the rationale for integrating learning strategies in teaching, a brief overview of the project is given. Two case studies are discussed in detail. Conclusions follow:

Symons et al. (1989) put it succinctly, “Once it is known that a population benefits from instruction to use a strategy, there remains the question of whether students can be trained to use the strategy consistently and appropriately” (p.17). Generally, teaching ‘generic’ learning strategies or ‘all-purpose skills’ to students is thought to enhance academic success and enable life-long learning (McCombs, 1988; Gibbs 1992). Course-length learning strategies instruction studies like those conducted by Dansereau (1978), Palincsar (1987), and Duffy et al. (1986) show evidence that instruction on learning strategies helps learning. For example, reviewing the study of Palincsar (1987), Symons et al. (1989) comment that “In general, students in the experimental condition outperformed students in the control condition on these measures. Even when the effect was not significant (i.e., on gist questions), there was a strong trend favoring the experimentals over the controls” (p. 21-22). The critics of teaching ‘generic’ strategies courses center upon the fact that learners are not able to generalize the strategies. First, they revert to their previous ways of learning soon after the strategy training and second, they don’t know how to apply the strategies in situations other than those met in the original training. In other words, learners fail to transfer the strategies learnt. Symons et al. (1989) rightly remark “...failures to generalize instructed strategies are widely known and frequently be-moaned...” (p.17). Chalmers and Fuller (1996) also believe that students who participate in generic strategies programmes quickly revert to their previous lower level patterns when they return to conventional courses of study. The authors conclude that the generic approach does not work because the skills are decontextualized from the learning of the subject matter. Learners are not given the skills to transfer the learning to different subjects (p.36).

Chalmers and Fuller propose that learning strategies should be taught *integrated* with the teaching of the subject matter by subject teachers. Other research confirms that more positive results are shown if strategy training is taught in a metacognitive, self-regulative context, in connection with specific content rather than generalized skills (McCombs, 1984; Weinstein, 1988; Garner, 1990.) Denise Chalmers (University of Queensland) and Richard Fuller (Edith Cowan University) carried out a number of case studies where subject teachers were invited to integrate learning strategies teaching within their courses. Results indicated that students in such integrated programmes used learning strategies more effectively and achieved better results than students who were taught in the conventional way. Further, results indicated that teachers can, in fact, teach their own students a repertoire of skills necessary for life-long learning. The authors concluded that “Integrating instruction in learning strategies with the teaching of regular subject matter overcomes the problems of decontextualized learning of strategies ...” (Fuller et al., 1995; Chalmers & Fuller, 1999).

2. The Project

Interest in the potential benefits brought to learning by teaching learning strategies in course context was the rationale for the *Teaching for Learning project* (University Grants Committee funded). The overall purpose of the project was to introduce and monitor the methodology espoused by Chalmers and Fuller, that is, integrating learning strategies into subject specific materials. The specific objectives were to

1. teach the process of *teaching learning strategies* to a group of teachers who, in turn, would teach learning strategies pertinent to the subject matter in their course to their students
2. produce quality interactive multimedia materials for a web site for:
3. teaching students at City University content specific learning strategies,
4. providing samples and guidelines to all teachers on how to incorporate learning strategies into their subject specific teaching materials.

The participating teachers then taught some learning strategies in their courses which they thought were most relevant to the students' learning of the subject content. They then documented their experiences in the form of case studies. Two such case studies are reported below. The first is the experience of introducing learning strategies to a group of students in a computer programming course in the Division of Computer Studies. Practical considerations preclude the possibility of adopting a rigid treatment group versus control group design. Instead, the instructor evaluated the success of the experience by observing the class and comparing the performance of this class with the performance of the class in the previous year. The second case study deals with specific strategies that help English learning. They were taught to a group of English learners in the Division of Language Studies.

2.1. Case One: Division of Computer Studies

Profile of Course

The course on which learning strategies were integrated with the teaching material, was a third (final) year course on a Higher Diploma in Computer Studies, Advanced Development Methodologies. The subject material of this course is high level and involves a great number of abstract concepts, which have to be applied to specific problems. Understanding concepts and applying them to new situations are most important. Added to this is the need for the students to master a computer package, a Computer Aided Software Engineering (CASE) tool, which they have to use in order to complete practical tasks, such as laboratory exercises and coursework. The students numbered 76 in the full time mode, and 15 in the part-time mode. As these students are all in their final year of study, they are proficient in computer programming and are all, of course, computer literate. These students are grouped together for lectures, but divided into smaller groups (maximum size of 20) for the purpose of tutorials and practical laboratories.

Integration

To succeed in the course the students must possess the following skills:

- Creative thinking
- Ability to explain to others
- Problem solving
- Investigative skills
- Ability to work as a team

The materials for the courses were completely restructured to include learning strategies as well as the material to be presented. The learning strategies to be integrated were problem solving, investigation, participative learning and examination skills.

2.1.1. Problem Solving in Lectures

To integrate problem solving into the lecture material presented quite a challenge, since the obvious approach would be to present the theory. How to do this using problem solving? The approach was not to cover the theory explicitly, but to introduce the theory as solutions to problems posed. This was achieved by using a Case Study Approach. The case study was a “Point of Sales Terminal” computer system such as found in supermarkets. This was simplified so that it could be covered in the confines of a series of one-hour lectures. A problem was then stated such as “How are the functions of the system specified and communicated to the user?” The solutions were then proposed, analysed and the optimum solution discussed in detail. So, the lecture notes not only conveyed the theory, but also produced an example derived directly from problems posed. Exactly, as the students would face in their own tasks. The reasons for this approach were communicated to the students during the lectures; this was so that they would gain experience in seeing problem solving in use.

2.1.2. Problem Solving in Tutorials

Rather than teach the students how to use the CASE tool using a “follow me” approach; the students were divided into four groups. Each group was presented with a diagram that had been produced by using the CASE tool. Each group was then given the directive: “Work out how to produce this diagram using the CASE tool”. Each group had to use problem solving techniques to succeed. In subsequent tutorials and laboratories, each group worked together on a case study problem, which followed the same sequence as the case study used during the lectures. This enabled the students to practice the problem solving techniques used in the lectures in a practical manner.

2.1.3. Investigation

So that students could appreciate the lecture fully, they were instructed to go to a supermarket (or a store) and observe the point of sale system in action. During a tutorial they were asked to report on how the system functioned, how a sale was completed, how refunds were dealt with and so on. This not only helped their understanding of the course material, but also gave them the learning strategy of investigation, which would be invaluable in future practical tasks. Another strategy was to pose questions during tutorial and laboratory for which the answer could not be found in the course material, or text book. The answer lay elsewhere, the students had to discover where. Although all students were Internet users, many possessed poor investigative skills when using the Internet. This strategy gave an opportunity to teach them better and more effective ways of using the Internet to enhance their learning.

2.1.4. Participative Learning

When each group had discovered how to use the CASE tool to draw their assigned diagram, they had to teach the other groups how to do the task. To teach someone to perform a task, they had to fully understand the task. It was very encouraging to see the success of this strategy; the students were very good teachers to their fellow peers. This also had the added benefit that each group learned how to accomplish four tasks with the CASE tool in the same time as it normally takes to learn one task. This technique proved to be a most effective, and pleasurable way to learn new computer software.

2.1.5. Examination Skills

Observations of students in Hong Kong indicate that they possess poor examination skills. They rush to get answers on paper, they misread questions, they write too little or too much, they include irrelevancies or simply copy from memorised course notes. In an attempt to improve their examination skills, students were given a mock examination question. They were then instructed to form their answer, and submit their answer for grading. This submission was performed by e-mail. Each submission was then marked as if it were a real examination question; in addition each student received a feedback sheet detailing why marks were lost and how to improve their answer. Whilst performing this assessment, common errors were identified. In a subsequent tutorial laboratory session, a “typical” student answer was used and shown to the students. This was then analysed in detail, and a correct solution derived from it. All students seemed to appreciate this learning experience.

2.1.6. Evaluation

A questionnaire regarding the effectiveness of the course was placed on a web site and students were invited to share their views. The results indicated that:

- The great majority of the students thought that the course was good.
- All students thought the course was taught and presented very well.
- The majority of students found the material of average difficulty. This was particularly pleasing since the material was challenging, and the students of the previous year found the material very difficult.
- The majority of students found the tasks in the tutorial laboratory sessions very challenging, but very rewarding and greatly aided their learning of the course material.

The marks of two classes are compared in Table 1: the marks of students in the 2000 cohort (without learning strategies) and 2001 (with learning strategies).

Table 1: Comparison of classes of two years

| WITHOUT LEARNING STRATEGIES | | WITH LEARNING STRATEGIES | |
|-----------------------------|---------------------|--------------------------|---------------------|
| <i>Grade</i> | <i>Distribution</i> | <i>Grade</i> | <i>Distribution</i> |
| A+ | 1.06% | A+ | 4.49% |
| A | 4.26% | A | 5.62% |
| A- | 12.77% | A- | 6.74% |
| B+ | 13.83% | B+ | 25.84% |
| B | 17.02% | B | 10.11% |
| B- | 22.34% | B- | 17.89% |
| C+ | 15.96% | C+ | 8.99% |
| C | 8.51% | C | 5.62% |
| C- | 1.06% | C- | 8.99% |
| D | 2.13% | D | 3.37% |
| F | 1.06% | F | 2.25% |

It can be seen from the above, that the strategy of removing the pure theory from the lecture material did not affect the overall results attained by the students, in fact for some grades the results were improved. The grades are derived from an overall percentage which is computed from marks obtained in practical coursework and examination. The mean overall score for both groups is as below:

Table 2: Comparison of students of two years

| WITHOUT LEARNING STRATEGIES | | WITH LEARNING STRATEGIES | |
|-----------------------------|--------|--------------------------|--------|
| Mean Overall Score | 54.15% | Mean Overall Score | 60.16% |

The results indicate that there was an overall improvement in both coursework and examination when learning strategies were integrated into the course material. One student who took the course twice scored an F grade the first time, but improved upon that and gained a B the second time. When asked, she remarked that the course was much easier and more enjoyable the second time. This was because she was able to learn the material by herself, applying the strategies gained.

2.1.7. Reflection

2.1.7.1. Successes

The strategy of using problem solving to cover the course material during the lectures was appreciated by the students because they could understand fully, why and how problems were solved. It was meaningful and useful for them. They could apply what they learned in the lectures immediately to problems tackled during subsequent laboratory sessions. The strategy of problem solving, discovery and teaching others in the laboratory sessions was a great success. The students learned how to use the CASE tool very quickly and effectively. They were also very good at explaining their solutions to their fellow classmates and seemed to enjoy it. The activity that was regarded as the most useful by the students was the mock examination. Although not all students submitted an answer for feedback, they all gained from the discussion of the mock examination question in the laboratory session and the overall examination marks were higher as a result.

2.1.7.2. Difficulties

Although the students viewed the problem solving strategy used during the lectures as useful, it did take a few weeks for them to adjust to the style. Also when attempting to solve their own problems in the laboratory session, some students attempted to copy the techniques from the lecture to the new problem instead of applying the techniques to the new problem. A number of students also found it hard to appreciate the theory from just seeing it used to solve a problem. Their suggestions were either to cover the theory, and then apply it to a problem, or to apply the theory to several different problems. These are good suggestions and will be considered when the course is offered again.

In the laboratories it was found that the scope of the problem was too large for the students to tackle in the time allocated. They needed time to review the lecture material as well as solve the problems. This can be remedied by scaling down the problems given to them.

2.2. Case Two: Division of Language Studies

Profile of Course

The course called *Effective English Language Learning Strategies* is designed for first year students studying in their second semester of the AA EPC programme (Associate of Arts in English for Professional Communication). The stated aims of the course are: to help students to understand their learning styles and develop effective strategies for language learning, and to help students develop a reflective and analytical attitude towards their learning and use of English. The activities used in classes to achieve these aims are discussed in the following sections.

Integration

Learning Styles Assessment.

The students became more aware of their learning styles by doing the Strategic Inventory for Language Learners or SILL (Oxford, 1990) as well as a number of computer-based activities. These included: Brain (a questionnaire which indicates which side of the brain the respondent uses more and whether he is a visual or auditory learner); an IQ Test; a Psychology Quiz (a questionnaire measuring introversion/extroversion and degree of selfishness).

2.2.1. Learning Strategies

The students learnt more about various learning strategies by playing The Embedded Strategies Game (Oxford, 1990). For the first assignment, students were asked to write a short review (not more than 500 words) on the English language learning strategies they had adopted in the past and the ones they were currently using. Their work was posted on this course bulletin board. They were also asked to read at least three reviews from students in a different class and give their comments on the bulletin board. (They were assessed not only on this review but also on the quality and quantity of the comments that they gave to the work of their peers.)

In the next assignment students were asked to write an overall report (not more than 800 words) on what they had learnt in the course, the strategies they had adopted and how useful they found them to be. They also commented on how transferable these skills were to the learning of other languages and subjects.

2.2.2. Peer Teaching

Each of the students paired up with another student and taught his peers for approximately 15 minutes. The topic of the mini-teaching slot could include the following:

- a number of vocabulary items
- a language learning strategy
- a grammatical structure
- a pronunciation point

Bulletin Board- By using an internet-based bulletin board, the students were able to post their assignments and comment on each other's work. They were already familiar with using the bulletin board as they had already done so in a course in the previous semester.

2.2.3. Evaluation

Comments from students - The following comment portrays the exam-oriented school system in Hong Kong:

I was examination-oriented. I learnt everything by rote and, sad to say, I didn't seem to have understood what I had learnt. I paid too much attention to the examination results too, as I knew that the examination results would destine my future. (Jenny)

And most have little or no experience of being explicitly taught learning strategies:

I've been studying for more than 15 years. Yet, I've never thought of the strategies that I've used on my study. After taking the course Effective English Language Learning Strategies, I've found that I've already make use of some of the effective learning strategies. (Carol)

Questionnaire- A questionnaire was administered halfway through the course (and will again be given at the end of the course) There were 3 tutorial groups with 16 completed questionnaires from each. Shown in Table 3 are the mean ratings on a 7-point Likert scale indicating how helpful the students perceived the activities to be.

Table 3: Comparison of the three tutorial groups

| <i>Activity</i> | <i>T1</i> | <i>T2</i> | <i>T3</i> | <i>Total</i> |
|---|-----------|-----------|-----------|--------------|
| Guessing Unfamiliar Vocabulary | 6.25 | 6.38 | 4.81 | 5.81 |
| Mini Teaching | 5.06 | 5.75 | 5.25 | 5.35 |
| Identifying main points | 5.13 | 5.56 | 4.07 | 4.94 |
| Bulletin Board | 4.44 | 5.06 | 5.13 | 4.88 |
| Organising Language Learning Strategies | 5.00 | 4.69 | 4.53 | 4.74 |
| Strategic Inventory for Language Learning | 4.56 | 4.44 | 4.31 | 4.44 |
| Students Only Bulletin Board | 4.13 | 5.00 | 4.13 | 4.43 |

The results indicate that all activities were rated above 4 so were deemed to be more helpful than unhelpful. The most helpful activities appeared to be Guessing Unfamiliar Vocabulary and the Mini Teaching, while the least helpful were the Strategic Inventory for Language Learning (SILL) and the Students Only Bulletin Board. There was, however, quite a difference for some of the activities between the tutorial groups. There was no real difference between tutorial groups 1 and 2 (hardly surprising as they were taught by the same tutor.) Guessing Unfamiliar Vocabulary and Identifying main points, however, seemed to be less popular in tutorial 3, while the students in this group found the bulletin board to be particularly helpful. This is very interesting as the materials used for all groups were the same. It seems that the tutor may be more of a factor in determining students' perception of what is helpful than the activity itself. Of the relatively few written comments on the questionnaire, the following were the most common:

1. What could be done to improve the 'Organising Language Learning Strategies' session? *Make it shorter.*
2. What could be done to improve the 'Mini Teaching' session? *Make it longer than 20 minutes.*
3. Which language learning strategies that you learned on the course do you find most useful to the learning of English? *Guessing Unfamiliar Vocabulary.*
4. Please include any other comments you have about the course. *Very interesting / useful course.*

2.2.4. Reflection

2.2.4.1. Successes

All the activities were regarded as helpful, especially Guessing Unfamiliar Vocabulary. The bulletin board was also very popular. At the halfway stage of the course, with only two of the five topics completed, one student had accessed the web page 213 times and another had made 27 postings. This may be because shy students, who are afraid to speak up in class or visit a professor in his office, feel more confident to contribute with comments online. They find electronic



communication less threatening because they have time to think before they write, in contrast to the pressure of speaking up in class. (Chickering & Ehrmann 1996).

2.2.4.2. Difficulties

In order to make the assessment of the mini teaching fair, the students were not given feedback in open class immediately after their teaching; they were given comments by e-mail instead. Some students would have preferred to receive their feedback orally and immediately. This would also allow the students to learn from watching the mistakes of others.

There were a number of technical problems associated with the operation of the bulletin board. It appeared that students preferred to make postings on the bulletin board in the knowledge that the comments would be read and assessed by their tutors. This seems to contradict the experience of David Brown, Department of Physics, McMaster University:

The open-ended questions that I set on the first assignment produced an initial flurry of activity, but I made the fatal mistake of intervening. Once they realised that I was watching, the discussion stopped dead and required a great deal of priming to get restarted. I discovered the hard way that the students need to struggle with the problems on their own and their discussions are out of bounds to the instructor

3. Discussion of the Two Case Studies

The two case studies indicate preliminary success but also point too many challenges of teaching learning strategies in subject context. It does; however, appear that the approach is working. In case one, the instructor finds many students learn better, and hence get higher grades, when they are helped with their learning strategies. The instructor also feels that students are employing a more active style of learning and enjoy learning more than in the classes he had before. In the second case, the students generally remark that the strategies taught are helpful (above point 4 in a 7-point scale). We conclude that teaching learning strategies in subject context is a tremendous challenge and may be influenced by the approach of instructors. As the instructor in case 2 commented, the success of the programme is very much influenced by the teaching style of the teachers. The opinions of specific learning strategies that students gave tended to be determined by who the teacher was. In other words, students only found strategies that were taught 'well' helpful. This places a great responsibility on teachers who want to implement this approach. Duffy and Roehler (1989), explain the difficulties in terms of a number of subtleties. First of all, there is the longitudinal nature of strategy learning. That means it takes a long time before learners actually understand and use learning strategies in the way the instructors want them to use them. Then there is the subtlety that learners understand the curriculum and the requirements of a course not by what the instructor say they are like but by what they are asked to be in the course. That means if an instructor is teaching high-level learning strategies while the activities in the course only demand low-level learning, the learners will not find the meaning in acquiring the high-level strategies and will not acquire them. There is also the subtlety that teachers need to be very talented in modeling mental processing involved in the strategies and that they should be skillful in monitoring student's evolving understandings and helping them with appropriate statements, cues, prompts and metaphors etc. at appropriate times.

4. Conclusion

Teaching learning strategies is a subtle and difficult task that requires not only the instructor's skillful presentation and guidance, but also the instructor's deep understanding of the declarative, procedural and conditional knowledge of the learning strategies in question. This is difficult to accomplish for a learning strategies specialist, but is certainly more difficult for an instructor who has not had special training. To make teaching learning strategies in subject context work, therefore, more support should be given to subject teachers. This may mean more workshops, more experience sharing, and more pedagogical support in implementing learning strategies into their syllabus. Another challenge is to categorically prove that teaching learning strategies in the context of courses i) improves performance, ii) develops the skill of transferring skills to other situations. Longitudinal studies need to be carried out to measure the effectiveness of improved learning strategies and performance.

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