Watching the Wheels Go Round-Observing Metacognitive Strategies in Class

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学習ストラテジーが英語教員の指導技術一つとして、広まってきている。しかしながら、それらがどのように活用されるべきかについては、多くの問題がある。また、さまざまな研究において、多様性（variable）の重要性が強調されている。本論では、学生間で見られるストラテジーが十分に生かされていない使用例を検証し、多様性に関する情報提供のために、その結果を分析した。そして、戦略アプローチを含む、成功へとつながるさまざまな要因を議論した。

Introduction

Learning Strategies

Learning strategies have become a largely accepted part of the teacher's toolkit, appearing in a number of textbooks and study guides. However, despite the large number of studies that have been conducted, there is a lack of clear empirical evidence to support their role in second language acquisition (Ellis 1994; Rees-Miller 1994). Developing out of 'good learner' studies, which studied the behaviour of 'good' language learners on the premise that it could be duplicated and taught to other language learners, research on learning strategies tended to concentrate on the different strategies used by learners or the number of strategies they used, equating frequency with success (Wenden 1985; Rost & Ross 1991; Dreyer & Oxford 1996), but only a few of these studies succeeded in directly correlating strategy use with language improvements (except in the field of reading). Indeed, some studies (Vann & Abraham 1990) found evidence of extensive strategy use not only among good learners, but among poor learners too. There is also evidence that explicit strategy instruction may be seen as unnecessary or a waste of time by the learners themselves (Rees-Miller 1994).

Despite this, learning strategies have proved popular, and the range of behaviours included under the heading has grown far beyond those initially identified. This has resulted in several classification schemes, perhaps the most useful being the cognitive approach developed by Chamot & O'Malley (see for example, Chamot et al 1996), which divides strategies into three

categories: cognitive, which deals with the processing of information and includes strategies such as predicting, grouping and inferencing; metacognitive, which is the executive function and involves managing the learning process, including monitoring and evaluating; and affective, which deals with social and emotional factors. These distinctions provide a useful starting point for assessing strategy use. Where most approaches suffer is not in the understanding of strategies themselves, but in failing to address what a strategic approach might be. If we accept a typical definition of learning strategies such as that given by Chamot: “techniques, approaches, or deliberate actions that students take in order to facilitate the learning and recall of both linguistic and content area information” (Chamot 1987:71) we can see how broad a range of behaviours this actually includes. In fact it could include virtually any technique, tip or study skill. Such a broad definition gives little sense of what constitutes the ‘strategic’ aspect of learning strategies. Given that strategy in its generally used sense implies gaining advantage at minimal cost, this kind of collection of techniques seems to be little more than a catalogue of methods, rather than what might be categorised as a strategic approach.

The Present Study

Researchers of learning strategies recognise there are many “learner, context, task, teacher and text variables” (Rubin & Chamot 1994: 771), without giving many indications of what these are. Clearly, for a teacher to have confidence in the strategies that they are teaching, these variables must be addressed. Given the concept of a strategic approach to strategy use, my interest in the present study was in identifying and examining a situation where strategy use could provide a clear advantage to students and to investigate some of the variables mentioned above in the hope of clarifying factors involved in successful strategy instruction and use.

The task that was chosen was one that had excited my curiosity. Students involved in a task would ask for help, not realising that the answers to their questions were available on the previous page of their textbook, in the answer to an exercise they had completed barely ten minutes before. This seemed a situation where a simple strategic intervention could reap large benefits. Advising them to check the earlier exercise was a simple and time efficient example of metacognitive strategy use. As this seemed to embody what I regarded as a strategic approach to using learning strategies, I decided to investigate further, to see to what extent students were actually using the resources at their finger tips and to what extent this kind of strategy might benefit them.

The Task

The task consisted of two parts which were undertaken sequentially and shared the same theme. They were designed to utilise similar or identical grammatical patterns, so the questions which appeared in Part 1 could be transferred directly to part 2 to give correct answers in 7 out of 10 of the questions. Both parts were completed on the appropriate pages of the students' textbook. Part 2 appeared on the following page to Part 1, so it was necessary to turn the page to refer to the model questions in the earlier part. This made it easy to see when students referred to Part 1.

Part 1 took the form of a general knowledge quiz. The questions were read out to the students, who were required to write them down and then supply the answers. The questions were read several times and students were encouraged to ask the teacher to repeat parts they didn't catch or explain or spell words they didn't know. The teacher then elicited answers from the class, correcting them as necessary.

Part 2 consisted of a series of answers. Students were asked to form a question that would match each answer. Several correct solutions were possible for each answer. For example, the answer '12' produced questions such as:

How many months are there in a year?

How many is a dozen?

How many star-signs are there?

During this time, the teacher circulated and gave help when it was requested. (During a normal class, the teacher would have been more active in helping students, but for the purposes of the study, refrained from offering help if it was not requested). After a suitable length of time, answers were elicited or given by the teacher, and students checked and corrected their work. Subsequently the students' books were taken in and the work checked.

First, both parts were checked for accuracy. Part 2 was also checked for relevance - students were required to write general knowledge questions, so questions such as "How old is my dog?" (answer: 12) or "What is my favorite number? (Answer: 12) were marked wrong.

Next, Part 1 and Part 2 were compared and note taken of which questions in Part 2 appeared to have been copied from Part 1. These were then divided according to whether the models in Part 1 were correct or not, and whether the copies were accurate or not. One final figure was calculated - what score each student would have received had all their copies been made accurately. The results were then tabulated according to student.

Results

Fig. 1

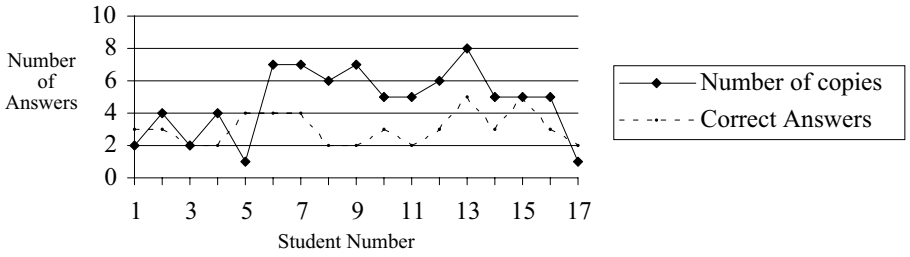
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Total Number Of Copies	3	3	2	2	4	2	3	2	2	3	1	3	5	3	4	3	2
Accurate Copies	1 (0)	1 (0)	0 (0)	2 (2)	1 (0)	3 (2)	2 (2)	1 (1)	2 (2)	1 (1)	1 (1)	3 (2)	5 (5)	2 (2)	4 (3)	3 (2)	1 (1)
Inaccurate Copies	2 (2)	2 (2)	2 (2)	0 (0)	3 (2)	1 (1)	2 (1)	1 (1)	0 (0)	2 (2)	1 (1)	0 (0)	0 (0)	1 (1)	1 (1)	0 (0)	1 (1)
Correct Answers	2	4	2	4	1	7	7	6	7	5	5	6	8	5	5	5	1
Potentially Correct Answers	4	6	4	4	3	8	8	7	7	7	6	6	8	6	6	5	2

The results were tabulated in fig.1, showing the total number of copies, accurate copies and inaccurate copies - with the number of copies based on correct models indicated in brackets after the number of copies eg.1(1), the number of correct answers on part 2 of the exercise, and the number of answers which would have been correct if all the copies had been accurate (potentially correct answers).

These results were then displayed in a number of different ways to clarify the relationships between them.

Comparing copies to correct answers

Fig. 2



Although the student with the highest score copied the greatest number of times {5 copies: 8 correct answers} and the student with the lowest score copied the least number of times (along with 3 others) {2 copies: 1 correct answer} plenty of variation exists in the results of other students eg {4 copies: 1 correct answer}, and {2 copies: 7 correct answers}. Therefore it seems no direct correlation can be made between the number of copies made by each student and their

final scores.

Correct and Incorrect Copies

Total number of answers	170
Total number of copies	52
Accurate copies	33
Inaccurate copies	19
Copied answers that were incorrect	26

These figures show that relatively few of the answers were copied: 52 out of a possible 170, and that more than a third of the answers that were copied were done so inaccurately. When the total number of copied answers that were incorrect is considered, we can see that 26 (50%) of all copied answers were incorrect, either as a result of inaccurate copying or copying an incorrect model from Part 1 of the task.

Correct Models and Incorrect Models

The accuracy of the model questions supplied in Part 1 of the exercise seemed relevant, as the figures indicated copies were made from both correct and incorrect models. Obviously, copying an incorrect model, accurately or not, would not increase a student's score. Accordingly the models from which the answers were copied, either accurately or inaccurately, were examined and the following figures obtained:

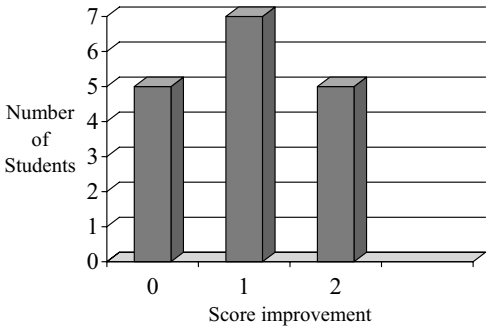
Number of copies of correct models	43
Number of copies of incorrect models	9

The number of correct models that were chosen heavily outweighs that of incorrect models, and does not reflect the proportion of correct to incorrect models as a whole. This demonstrates a high degree of selectivity in choosing models from which to copy. In fact, the total number of correct models was 75 out of a total of 170 answers. If we reverse the figures, to show the number of possible incorrect answers, the figures are more striking. Out of a possible 95 incorrect answers, only 9 were actually copied. This ability to differentiate correct and incorrect models had not been immediately apparent from the data.

Improvement of scores through copying

Although copying did not correlate directly with the number of correct answers, the above results make it clear that accuracy in copying was a significant factor. Therefore the potential score, as if all copies had been made accurately, was calculated for each student. The actual score was deducted from this, to see if accurate copying would have produced a significant increase in score.

Fig. 3

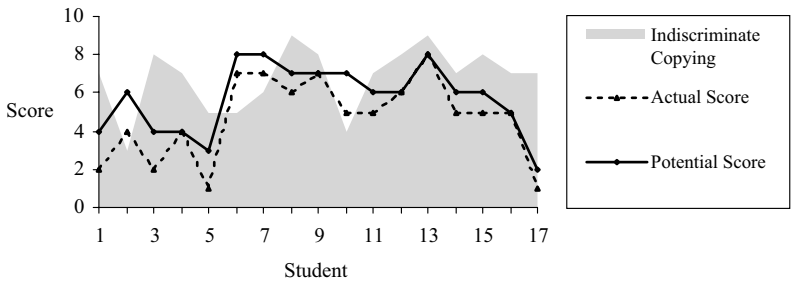


As can be seen from fig.3, 12 of the 17 students would have benefited from an increase in score if they had copied the model answers accurately, while the scores of 5 of the students would have remained unchanged. This appears to confirm my intuition as to the value of copying in this exercise.

Indiscriminate copying vs focussed copying

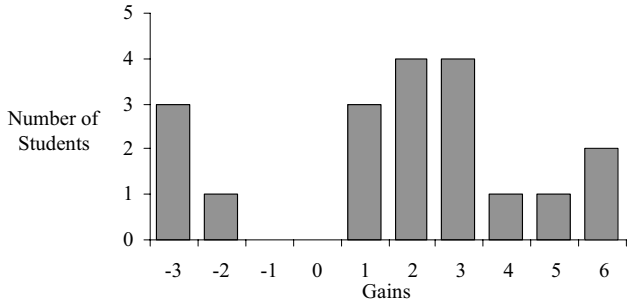
If, as the previous results showed, copying could produce better results in the majority of students, would more copying produce even better results? Fig.4 plots the actual results against potential results and results as they would have been if students had indiscriminately copied all the models from Part 1.

Fig. 4



As we can see, indiscriminate copying would have produced increased scores in 13 out of the 17 students against both actual and potential scores. In some cases the gain would have been as high as 7 points more than the actual score (6 more than the potential score), which is a very substantial increase. The aggregate score of the class would have risen substantially. However, in the case of four of the students, this strategy would have had the opposite effect and decreased their score. A detailed breakdown of the gains and losses is given in fig.5 below.

Fig. 5



Analysis

The results recorded above went some way towards confirming my initial observation about the relatively small amount of reference to previous tasks, and also shed light on some surprising aspects of this area of the students' use of strategies.

As noted above, there seemed to be no direct correlation between the incidence of copying and the number of correct answers. Though some of the students who copied more did get good marks, others who copied an equal number of times did not. Possible factors which would go towards explaining this include the fact that there are many possible answers for each question, which means that the correct answer does not necessarily involve any reference to Part

1 of the task. Likewise, an incorrect answer does not automatically indicate the student would have done better by copying. Owing to inaccurate copying or copying an incorrect answer, it is possible for students to lower their final scores instead of raising them.

Successful copying seems to depend on two key factors: which answers are chosen as models and how accurately these models are copied. Although more of the copies were accurate than not, the proportion of inaccurate copies was fairly high - more than a third of all copies were made inaccurately. If we look at the total number of wrong answers that were the result of copies (including accurate copies of incorrect questions) the figure jumps to 50%. This combined rate of success/failure is significant because it represents the success of copying as the students would perceive it. Not being in a position to analyse their own results to see where the strategy had failed, they would observe that sometimes copying was successful and sometimes not, in roughly equal proportions (though differing from student to student). This would put copying into the category of risky strategies and might go some way to explain the low incidence of copying amongst the students.

Looking at the number of students who made inaccurate copies, we can see that it is fairly high: 12 out of 17. It is interesting to note that those who did not make mistakes in copying were typically high scoring. Though there appears to be some correlation on this point, there is no evidence of direct causality, and it might reasonably be assumed that students who exercise more care in one area of their work are likely to do so in others and thus tend to score highly on tasks that involve accuracy in areas such as grammar and spelling.

The results which proved most surprising were those that showed the relationship between the copies of correct models and the copies of incorrect models. The degree to which students were able to distinguish between correct and incorrect models to copy from appears quite sophisticated. This is even more apparent when the total number of possible mistakes is considered. If the students assumed all the answers to the first exercise to be correct, we might expect that the choice of correct models to copy would reflect the proportion of correct model questions: incorrect model questions in part 1, which was 75:95. However, this was not the case. The actual proportion was 43:9. The surprising success of students in choosing correct model answers to copy was obscured by other factors. It went unnoticed in the classroom and in a preliminary review of the results as it was not reflected in other areas of the task. This was presumably a result of i) the low incidence of copying, and ii) the inaccuracy of copying. This suggests the usefulness of focussing strategy instruction on specific (and narrowly defined) areas to achieve improved results.

Another important area of interest was how much the students stood to gain by successful

copying. Was this a useful strategy or not? These results do not allow a comparison of students who did no copying with those who did, however they do show that over 75% of students would have improved their final score if they had, simply, copied accurately. Of those, 7 would have improved by 1 point and 5 by 2 points. This supports the supposition that instruction or specific encouragement to copy more accurately would have been effective.

The degree of copying was also relevant. We can see from fig.6 that had the students simply copied all the models from part 1 indiscriminately, regardless of whether they were correct or not, their scores would, in most cases have improved (assuming accurate copies). However, this was not the case for 4 of the students, all of whom improved their score through copying the models they chose, and would have received increased benefit from accurate copying, but whose scores would have worsened if they had chosen to copy indiscriminately. This brings home the dangers of over-simplified strategy instruction, where one approach is taught as applicable to every student. What works for some students is ineffective for others. Clearly, for these students, instruction to copy indiscriminately would have reduced their score by interfering with a partially successful approach which they already employed. Interestingly, the reduced scores for these 4 students would be among the five lowest in the class, falling from 4 to 3; 7 to 5; 7 to 6; and 5 to 4 respectively. The potential drop (if all copies were accurate) would be even greater: 6 to 3; 8 to 5; 8 to 6 and 7 to 4.

The majority of students, however, stand to gain from this strategy - the increased copying creating substantial advantage. This is particularly evident in the students who had the lowest scores. They would have risen from 2 to 7; 2 to 8; 1 to 5; and 1 to 7 respectively. The gains of other students ranged from 1 to 3, with an average gain of 2 points with respect to their actual scores.

Once again, this shows that strategies confer varying advantages on different students. Though it seems those who would benefit most were those students who achieved the lowest actual scores, and thus may be suitable for targeted instruction, the data gathered seems to offer no sure way of predicting those whose scores would suffer through use of this indiscriminate strategy. The sample size was too small to make any strong statistical predictions, but it may be noteworthy that it appears equal numbers would have found the strategy of indiscriminate copying highly advantageous and disadvantageous, while for the majority it would have conferred definite but less spectacular advantages. Whether similar proportions would be found in a larger sample is speculation, but experience in the classroom supports the intuitive judgement that most if not all strategies taught to students will likewise fall into those same groups.

Discussion

The preceding analysis raises a number of questions that bear directly on the teaching of learning strategies. There are also several issues that are suggestive of the need for further research.

First it is necessary to say a word or two about the flaws of this research. Primary amongst these is that the results cannot claim to show unequivocally which answers were copied and which were not. Similarity between model questions in Part 1 and questions written by students in Part 2 are assumed to be the result of copying, but it is possible that they were arrived at without direct reference to Part 1. This assumption is based on the subjective judgement of a teacher - though this is itself the result of a familiarity with the students and likely behaviour in the class, as well as direct observation of the students engaged in the task. However, even if some of the answers were wrongly ascribed as the result of copying, the conclusions regarding the effectiveness of copying and the gains possible from doing so, remain valid, as do most if not all, the other observations on strategy use. If anything, they lend more weight to the value of this strategy and reinforce the concept of targeted strategy instruction

Some inaccuracy may also have been introduced by varying degrees of help that were given to students undertaking the task. As it was conducted during a lesson and was not intended to be a test, students were free to help one another and ask the teacher for help. This is one of the inevitable corollaries of classroom research, where the education of students must assume priority over research. In this case, as such intervention would (it is hoped) have served to increase student scores, the conclusions, once again, remain valid.

As discussed above, one of the problems found in research into learning strategies is establishing the circumstances in which strategies can be used most successfully and how they should be taught. In fact, many of the less successful examples of strategy instruction appear to be the result of a blanket approach to strategy instruction. The most common antidote to this (Chamot & Rubin 1994) appears to have gone too far in the opposite direction, requiring an extensive investment of time that might be better spent in direct language instruction and practice.

My initial aim in conducting this research was to identify an area in which simple, time efficient strategy instruction might produce measurable improvement in results. Further, I hoped this strategy would be broadly applicable across a range of situations. Having observed students making little use of resources that were readily to hand, I assumed results would show the efficacy of using previously completed work to supply answers for the task they were working on.

Though I anticipated more copying would produce better scores, I had not realised how inaccurate many of the copies were. Clearly this would make the primary strategy less effective. Fortunately, it seems likely that a simple intervention could improve the situation and produce increased scores - this is supported by the results showing potential scores (fig.5). In instructional terms, this kind of intervention is both quick and easy, and need consist of little more than a verbal reminder delivered to the class or to individual students. If it was perceived to be a continuing problem, more specific instructional methods could easily be devised. This is, of course, standard fare for most teachers, but it embodies the essence of strategy instruction - functional efficiency.

Similarly, encouraging greater use of copying would only require a simple reminder that the models for the questions for Part 2 could be found by turning the page back to Part 1. This could be expected to produce more copying and, assuming the copies were accurate, increased scores. Indiscriminate copying, though clearly effective in the majority of cases, was shown to be a flawed strategy and not universally applicable, thus providing a useful warning against overly prescriptive instruction in strategy use. It suggests that care must be taken in the way the strategy is advocated. In this case, it would be easy to remind students that many of the 'answers' could be found in Part 1 and advise them to check it if they were stuck or when they felt it was appropriate. I feel it is important to remember that students already possess a set of learning strategies that have been successful in the past. Introduction to new strategies and ways of learning is part of education, but forcing a teacher's way of doing things onto students is not always appropriate.

Although copying proved to be effective, and would have been more so had the copies been more accurate, the results show this was not necessarily clear to the students themselves. This may partly explain the comparatively low incidence of copying, as a strategy that had been tried in the past, but did not prove to be particularly successful. It is also possible that the students were not sufficiently confident of the correctness of the models in Part 1 to adopt them as models on a more widespread basis. The proportion of correct models that were chosen to copy seems to imply some degree of choice was involved in the decision to copy or not, rather than simply forgetting that the option was available. It would be interesting to see whether a set of correct model 'answers' supplied by the teacher would produce a higher incidence of copying. If so, this would suggest student confidence in the correctness of the model is a factor in the incidence of copying, and thus change the thrust of instruction from awareness of a resource to trusting that resource.

The surprisingly high ratio of correct models to incorrect models that were copied

indicated a high level of proficiency at distinguishing correct answers from incorrect ones. This is presumably the result of previous experience with this type of task, and suggests a highly developed set of strategies suitable for the types of task they had to deal with in earlier stages of their education. The lack of accuracy in copying may indicate the emphasis of multiple choice type questions over ones that require the answers to be written. In this task, however, this skill was obscured as it was used at an intermediate stage of the task and not translated into the final results. The question of what other skills or strategies students possess and whether it is possible to utilise them in a way directly related to class objectives, is one that will be of great interest to teachers. Although this is a topic that falls outside the scope of this research, it seems worthy of future investigation.

The question of strategy choice in general is very important to the implementation of learner strategy instruction. This study examined a task which could be performed effectively through the use of a particular strategy. The failure of many students to use this strategy was easily observable and amenable to direct intervention. The potential success of the strategy and thus its value and the reason it can be successfully taught is that it was so little used by students in the class. In a class where most of the students already used the strategy freely, there would be little to gain from teaching it to the class as a whole, though individual students who were not using it would still stand to benefit. The ability to ascertain relevant strategies and target students needs would appear to be a major indicator of success, suggesting needs analysis of some description to be a necessary part of successful strategy instruction.

Conclusion

The results of this study make it clear that this particular strategy did confer an advantage to users, and despite the lack of direct correlation between the number of copies and the final score, it was clear that more accurate copying would have produced higher scores, and that indiscriminate copying would have produced even greater gains on aggregate, (although significantly, these gains would not have been enjoyed by all students, suggesting extra care should be given to ensuring that strategy use is presented as an option, and not a must). However the effectiveness of the strategy was compromised by students' inaccuracy in copying, which was an unexpected complication highlighting the importance of subsidiary skills that allow the main strategy to be used successfully.

This raises several further questions about strategies and strategy instruction. For example, what role do subsidiary skills play in other strategies? Is it more effective to target

strategies in groups rather than singly? What proportion of students typically experience negative results from using strategies and how can these effects be reduced?

Perhaps what was clearest, from the point of view of a teacher, is that strategies can be useful if sensitively and imaginatively applied. However, maximum value can only be obtained with a firm grasp of the purpose of the task and knowledge of the 'choke points', or where the students are having most difficulty with the task. With this kind of diagnosis, strategies may be applied at the point where minimum intervention can produce the greatest result. It is this kind of approach to the use of the wide variety of techniques commonly called learning strategies that deserves the label 'strategic'.

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Metacognitive Learning Strategies in All Classes. Contributors: Saundra McGuire, Dave Gosselin, Martha Mamo, Mary Anne Holmes, Jenefer Husman, Sandra Rutherford, Sister Gertrude Hennessey, Ji-Sook Han, Wumi Alabi, Demet Kirbulut. Course level: Introductory level. Description of the metacognitive tactic: To introduce and make students aware of strategies to determine organizational structure of information. Goals for using this tactic. Learning goals: The overall goal is for students to develop their own organizational structure tactics for each content area. e.g concept mapping, outlines, refl Start studying 10 Metacognitive Strategies. Learn vocabulary, terms and more with flashcards, games and other study tools.Â You can have the basic knowledge and find the main idea of the materials before you go to class. Preparing for active reading. Find a way to motivate yourself to read, esp. by coming up with questions. Metacognitive strategies also play a crucial role in enabling students to become active participants in their own learning and school communities. Students who have the opportunity to exercise voice, agency and leadership in designing, From Amplify: Generating a positive cycle of learning.Â HOW TO INTEGRATE METACOGNITIVE STRATEGIES IN YOUR CLASSROOM A good starting point for every teacher is to assess their studentsâ€™ mindsets3. The presence of specific attitudes, motivations and dispositions in a learner can: â€¢ enhance their capacity to learn.