Further investigations into student learning strategies

学生達の学習方略に対する更なる検証

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これは、教室の授業でメタ認知方略の活用を検証した前回の論文(2007年Hellman著)の続きである。このような学習方略の活用が学生達にとって有益なものかどうかについての結論は、前回の論文では出していなかったが、今回は、この分野での検証を一歩進める。その検証方法として、方略指導を、教師にも学生にも効率のよい効果的な付加的道具として重要なものであることを分析する。この論文は、次の2つの疑問に焦点を合わせている。第一は、方略指導が生徒による先例照応（レファレンシング）の準拠率を増加させる結果になるかどうか、第二は、方略的アプローチをした結果、先例照応の確度も増えるのかという点である。ちなみに、我々の検証の結果、両方の問題に対する答えは共にイエスである。

Introduction

This paper presents a continuation of previous research into the use of learning strategies in class (Hellman, 2007), which examined student use of metacognitive strategies. Analysis of the data gathered indicated the value of strategy use in this context, but it was noted that further investigation was needed to test the effectiveness of instruction in strategy use. It was also suggested that a 'strategic approach' would resolve some of the problems that have appeared in research into learning strategies. The present study seeks to build on these findings and compare the performance of those students who were instructed in strategy use, and those who were not.

It was noted in the previous study, that though they are generally accepted as part of the teacher's toolkit, research into 'learning strategies' presents a number of problems. A cursory examination of the field reveals the wide range of what are labelled 'strategies'. A typical definition, such as that offered by Chamot: "techniques, approaches, or deliberate actions that students take in order to facilitate the learning and recall of both linguistic and contact area information" (Chamot, 1987, p.71) is so broad as to offer little sense of what a strategy is, and how and when it can or should be applied. For the teacher, there is little guidance on how such

techniques can be included in a course of teaching on more than an ad hoc basis.

Additionally, the evidence to support their use is confusing and contradictory (Ellis, 1994; Rees-Miller, 1994). Early studies purporting to show their effectiveness have often proved inconclusive (Oxford, 2002, p.126), and several others have raised pertinent questions regarding strategy use (e.g. Vann & Abraham, 1990). The unanswered questions serve to exacerbate the problem noted above: despite acknowledging that there exist "many learner, context, task, teacher and text variables" (Chamot & Rubin, 1994, p.771), there is little agreement on what makes strategies effective. This confusion has lead to some serious reservations about the teaching and use of strategies (Macaro, 2006).

In the previous study it was suggested that to term a technique or approach a 'strategy' suggests that, in common with its use in other contexts, it will confer advantage at minimal cost. This minimal cost, when applied to the classroom, is to be borne by the learner. Long-winded, troublesome, or difficult approaches might be seen as having a greater 'cost' than simple, easy to apply techniques. A 'strategic approach' can be seen as an attitude or methodology employed by the student which enables them to gain a learning or study advantage with a minimal cost of time or effort. It may include specific techniques, but it is not limited to them. It allows the student a degree of autonomy in selecting those methods which are best suited to the occasion and to that student personally.

Whether it is made explicit or not, we feel the concept of a strategic approach goes some way towards solving the problems described above. It provides a framework that the teacher can use both in selecting and teaching strategies; it should also provide benefit to students at a minimal cost in time and effort. Both this study and the previous one explore one example of strategy use, in the hope of finding some principles of use that could be applied more widely to an overall 'strategic approach'.

Closely linked to the concept of a strategic approach, is the question of how strategies should be taught. The authors' experience in the classroom has made them aware of the relationship between the length of time taken to explain an activity to a class of students and the value that will be derived from performance of that activity. Quite simply, if it takes too long to explain an activity, it might not be worth doing it. Similarly with strategy instruction, if a structured approach such as that favored by O'Malley and Chamot (1990) is followed, the process of

teaching - explaining, practicing and evaluating the strategy – may take up time that might be more usefully spent in other activities. This is especially true when teaching occurs in the target language. Researchers admit many of the recommendations for strategy instruction are based on the assumption that the instruction at lower levels is in the students' L1 (Chamot, 2005, p.122). The amount of instruction required for the students to be able to use a particular strategy is thus an important issue from the point of view of the teacher. The usefulness of any strategy which is taught should justify the time spent on teaching it: the quicker and more simply it can be taught and understood, the more easily it can be included in a course of teaching.

The Previous Study

The previous study grew from the observation that many students were failing to refer to previously completed textbook exercises that were directly relevant to the tasks they were presently engaged in. The questions that the students asked the teacher as he walked around the class were often ones that could be answered by turning over a page and referring to the exercise that had been completed earlier that class. It seemed that a simple intervention by the teacher, such as reminding students to refer to the previous exercise, could easily remedy this failing. In the widely used classification scheme developed by Chamot and O'Malley (Chamot, Barnhard, El-Dinary & Robbins, 1996; Chamot, 2005; O'Malley & Chamot, 1990) the awareness and management by a learner of his or her own learning is classified as a metacognitive function. Strategies involved in the management of his/her learning, such as monitoring, choosing how to approach a task, selecting appropriate strategies and evaluating the results are classified as metacognitive strategies. (The other major classifications are cognitive, referring to the processing of information, and affective, which includes emotional and social factors.) The strategy in this case, referring to a previous exercise, was seen as a typical example of a metacognitive strategy.

The study was designed to investigate whether students were referring to the previous exercise or not and to what degree application of this strategy (i.e. referring to the previous exercise) could help students produce accurate questions through recycling of grammatical structures.

Although the results suggested that low scores in the second activity were partly related to underdeveloped or poorly utilised skills necessary for the effective use of this strategy (e.g. inaccurate copying), as well as misuse or under use of strategies, they supported the author's

supposition that encouragement or explicitly telling students to refer to previous material would have been effective (Hellman, 2007). However, it was felt that overly 'strong' instruction on the part of the teacher might force students to utilise a strategy against their own best inclinations, so a hypothetical scenario was also projected: how would the students' scores have been affected if they had all simply copied the grammatical structures in the previous exercise, complete with mistakes? The results of this hypothetical scenario showed that although the majority of students would have achieved higher scores, a few would have got lower scores. This suggests that however useful a strategy may be, it will not necessarily be suitable for use by all students, and thus care should be taken not to force students to adopt a strategy that might be counter productive.

The Present Study

Although the results obtained from the previous study suggested the value of strategic intervention by the teacher, they were not conclusive. It was designed to examine student behaviour with respect to metacognitive learning strategies, and did not explore the results of direct strategy instruction.

 The present study was designed to investigate the effect of strategy instruction on two main points:

    i) Did strategy instruction result in increased incidence of referencing on the second phase of the textbook activity as predicted in the previous study?

    ii) Did strategy instruction increase the accuracy of the referencing?

To do this, the present study provided direct comparison by including a control group who were not instructed to use any specific strategy. The two groups were chosen at random from among the first year English Communication classes taught by the authors at Kansai University. The groups consisted of twelve and thirteen students for the study group and the control group respectively.

The present study was modelled on the previous one. The strategy selected for examination was the use of a previously completed exercise which included examples of grammatical forms as a reference that could be utilised to complete the next task. (The task could also be successfully completed using different grammatical forms.) The students were given a series of answers for

which they were required to write corresponding questions. Very similar questions had been dictated to the students in the task they had just completed and so the task could be completed by turning back one page, selecting the appropriate questions and using them as models for the current exercise. (See appendices.) The previous study had been triggered by the observation that many students did not, in fact, turn back the page to look at the exercise they had just completed, even though some of them found the second part quite difficult to complete.

As before, the activity consisted of two parts: in part 1 questions were dictated to the students, who then had to write answers to them. The dictation was self-checked, and the answers elicited orally from the class. Part 2 of the activity, which was on the next page of the textbook (requiring the students to turn over the page) presented the students with answers for which they had to write the questions. The topic (sport) was the same as the previous dictation question and answer exercise, and it was possible to write questions for all the given answers by referring to the previous exercise – the grammatical patterns of the first set of questions and answers corresponded directly to the second set. Questions were marked correct if they were free of grammatical mistakes, irrespective of whether they corresponded to the models in part 1.

In this study, the control group were given no explicit directions as to how they might complete part 2 of the activity. The study group were told that the questions were similar to the ones they had just completed and that it was 'a good idea' to check the previous page 'if they wanted to'. This suggestion was reinforced as the teacher checked on the progress of individual students if it appeared they were having trouble with the task. After the task was finished, both parts of the activity were collected by the teacher and checked for grammatical correctness, and for the relationship between the questions in part 1 and part 2. If the relationship was close, the questions were deemed to have been 'referenced' from part 1. This referencing was regarded as successful use of the strategy. Table 1 shows examples of students' answers that were marked correct (i), (ii), and incorrect (iii) and (iv). In (i), the student has used the same construction in part 2 as in part 1. This is taken as evidence of direct reference. (ii) shows a correct answer where the student has not referred to the corresponding question in part 1. In example (iii), the student has inaccurately copied the correct question from part 1. In (iv) the student has not referred to the question in part 1, and has not produced a grammatically correct question. (i) and (iii) show use of the strategy; (ii) and (iv) do not.

Table 1

Sample answers showing marking

	Model question in Part 1 (answer in parentheses)	Corresponding answer in Part 2 (given answer in parentheses; mistake underlined)
i) Referenced answer marked correct	What famous manga was written about basketball? (Slam Dunk).	What famous manga was written about boxing? (Ashita no Jo).
ii) Non-referenced answer marked correct	What famous manga was written about basketball? (Slam Dunk).	This manga is the most famous boxing manga in Japan. What is it? (Ashita no Jo)
iii) Referenced answer marked incorrect	Where did tennis originate? (Britain).	What did sumo originate? (Japan).
iv) Non-referenced answer marked incorrect	How many people are there in baseball team? (9).	How many people play a soccer? (11).

There were certain differences between the activities in the two studies: in the first study, the topic for the questions in the activity was general knowledge; in the present study the topic was sport. This change was partly owing to the evolving nature of the curriculum, and partly to the desire to engage the students more directly in a topic that was likely to be of interest to them. It required a narrower focus in the second part of the activity, and it is possible that it made the task more difficult for some of the students. It was also felt that the additional focus made indiscriminate copying less likely – this strategy was examined in the first study, and though results suggested that it would have been an effective strategy in that particular activity, it was felt that this approach was not one that would be widely applicable, nor generally successful.

Results

The results for the two groups are displayed in Table 2 and Table 3, showing the following figures for each student: a) the number of questions answered; b) the number of answers that were referenced; c) the number of accurate references; d) the number of correct answers that were not the result of referring to part 1; e) the total number of correct answers; f) the number of answers that were potentially correct if:

- the students had accurately checked and corrected part 1.
- the students had accurately checked and corrected part 1 and all their references had been accurate.

This was derived by adding the number of accurate references (c) or the total number of references (b), respectively, to the number of correct answers that were not the result of referencing (d); g) the referenced answers as a percentage of the total number of answers.

Further investigations into student learning strategies（Hellman, Jones）

Table 2

Study group

Student number	1	2	3	4	5	6	7	8	9	10	11	12	Total
a) Total number of answers (out of 10)	6	7	8	6	6	9	6	6	6	5	8	4	77
b) Total number of references	0	6	5	5	2	6	5	4	6	1	5	3	48
c) Accurate references	0	5	5	5	2	6	5	3	5	1	4	2	43
d) Correct answers (non referenced)	3	0	1	0	0	1	0	0	0	3	0	0	8
e) Correct answers (total)	3	5	5	4	2	7	5	3	5	4	4	2	49
f) Potentially correct answers (c+d)	3	5	6	5	2	7	5	3	5	4	4	2	51
(b+d)	3	6	6	5	2	7	5	4	6	44	5	3	56
g) % of answers that were referenced (b/a x 100)	0	86	63	83	33	66	83	66	100	20	63	75	62

Table 3

Control Group

Student number	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
a) Total number of answers (out of 10)	6	6	6	10	4	6	4	6	10	6	6	6	5	81
b) Total number of references	5	4	5	3	1	3	0	3	3	3	2	0	0	32
c) Accurate references	5	3	5	1	1	2	0	3	3	0	2	0	0	25
d) Correct answers (non referenced)	0	1	0	3	0	1	3	0	1	0	0	0	0	9
e) Correct answers (total) correct answers (c+d)	2	2	5	4	1	3	3	2	4	0	2	0	0	28
f) Potentially correct answers (c+d)	5	4	5	4	1	3	3	3	4	0	2	0	0	34
(b+d)	5	5	5	6	1	4	3	3	4	3	4	0	0	41
g) % of total answers that were referenced (b/a x 100)	83	66	83	30	25	50	0	50	30	50	33	0	0	40

Table 4

Comparison of Study and Control Groups

	Study group	Control group
Total number of answers	77 (64%)	81 (62%)
Answers referenced (% of total)	62%	40%
Rate of accuracy of references	90%	78%
Accurate non-referenced answers (% of total)	10%	11%

Tables 2 and 3 display the results for each student on an individual basis, and the total for each group. As this study aimed to compare the effect of strategy instruction, a direct comparison was made in Table 4, which displays the results that were considered most relevant, expressed as percentages.

Several observations may be drawn from an initial examination of the results: it can be seen that both groups displayed a similar rate of answering questions: 64% and 62% respectively. This was regarded as important as several students displayed no use of referencing and had few or no correct answers. However these students (e.g. Study 1&10, Control 12 & 13) were not inactive, and answered a similar number of questions to other students. Additionally, it can be seen that the students who answered most questions (Control 4 & 9) made relatively little use of referencing, suggesting that there is little correlation between student 'activity' and use of referencing.

The low number of correct answers may seem a little confusing: as the students were theoretically referencing model answers, each accurate reference should have produced a correct answer. In some cases this is clearly not so. Control 5, for example, made five accurate references but got only two correct answers. How could this be? Examination of the part 1 exercises revealed that although the answers had been checked and corrected by students, using an answer sheet with the correct answers, this task had not been completed accurately by all the students, with the result that they were referencing incorrect answers as well as correct ones. The figures for the correct answers were therefore not deemed useful for this study as they reflected a number of different factors in addition to strategy use.

For this reason, two other sets of figures were included in the results table to help assess the effectiveness of referencing as a strategy. These figures, which were calculated as if part 1 had been corrected accurately were designated 'potentially correct answers', as explained above.

     (i) using the figures for 'Accurate references' (c+d).

     (ii) using the figures for 'Total number of references' (b+d).

As the effectiveness of the strategy was not one of our major concerns, these figures were not included in Table 4, but in a separate table below (Table 5). They are expressed as percentages of the total number of questions answered by each group.

Table 5

Potentially correct answers

	Study Group	Control Group
Potentially correct answers if all models had been correct (c+d)	66%	42%
Potentially correct answers if all models had been correct and all references were accurate (b+d)	73%	51%

The table predicts the study group would have scored higher than the control group using both the actual rate of accuracy (66% to 42%) and given an ideal rate of 100% accuracy (73% to 51%). The difference seems quite large in both cases, and suggests not only the value of instructing students to use this strategy, but also the additional increase in correct answers that could be gained if more attention was paid to accuracy by the students.

Comparison between the two groups was made to examine the differences between the two groups in terms of the incidence and accuracy of referencing. Any differences that were apparent would appear to reflect the effect of strategy instruction. Table 4 reveals that the differences are substantial. It shows 62% of the study group's answers were referenced, compared to only 40% in the case of the control group. The rate of accuracy was also greater for the study group, with 90% of their references being accurate. In the case of the control group, the rate was 78%. The differences in both cases appear to be the result of strategy instruction. The rate of accurate non-referenced answers was very similar in both groups – 10% for the study group; 11% for the control group, which lends additional weight to the belief that strategy instruction was responsible for these differences.

Discussion

The above results shed some more light on the use of strategies and seem to confirm the value of focussed strategic intervention for specific tasks.

The results in Table 4 relate directly to our principal concerns in this study: the effect strategy instruction can have on the incidence and accuracy of this strategy. The difference between the study and control groups provides evidence for the effectiveness of strategy instruction on both these points. Not only did the study group clearly show greater use of referencing, they referenced more accurately. This was achieved with very little use of lesson time on the part of

the teacher, and required very little explanation. This supports our contention that strategy instruction need not be heavily structured to be effective. In this case, minimal instruction proved very successful in encouraging students to use the resources available. The greater degree of accuracy that can be seen in the references may be explained by the greater attention paid by students to referencing after their attention was drawn to it by the teacher. The teacher did not mention the need to be accurate or take care that they copied the questions they were referencing accurately, but the specific mention of referencing seemed to affect the rate of accuracy in any case.

Although it is impossible to be certain that the students would not have referred to part 1 to help them with part 2, the difference between the two groups seems too great to ignore. The instructional method employed – suggesting and encouraging them to refer to their previous work, was not only easy to apply as a teacher, but satisfied the previously noted conditions of a strategy: it conferred advantage at a minimal cost (in terms of time and effort) for the student. In this particular case, the strategy was an example of an approach that has widespread application throughout any particular student's course of study – in fact, referring to relevant resources, and recognition of what constitutes a relevant resource, can be seen as a life skill rather than as simply a study skill. In terms of language learning, it can help promote the experience of language as a system, rather than a series of discrete rules, tasks and linguistic items.

Within the confines of this activity, the strategy instruction appears to have been successful – given the ease with which it can be applied by both the teacher and the students, it may prove relatively easy to reinforce and build on this strategy to form a habit, rather than remain a one-off technique. Once this becomes a habit, we might consider the strategy to have been learned. Although the strategy was manifested as turning back a page and copying the grammatical forms of the questions in the previous part of the exercise, this is just one of many applications; it is to be hoped that the strategy, using available resources (in this case a previously completed textbook exercise), is absorbed, as well as the particular technique. The teacher could make the students aware of other applications of the same strategy, or repeat variations of the same technique, to reinforce it. It may be desirable to make it explicit at some stage of the course, but this does not seem to be necessary for the success of the strategy. The authors consider this significant as it differs from the commonly advocated 'direct informed' pedagogic method (O'Malley & Chamot, 1990) in allowing more freedom to the teacher, and relying on experience and commonsense more than prescribed instructional methodology.

As noted in the previous study, it seems likely that successful strategies may not be suitable for all learners in all situations. The two students in the study group who didn't make much use of referencing but achieved reasonable results remind us of those students who have already developed successful approaches to learning tasks. The authors feel that forcing them to use learning strategies against their inclination could prove counter-productive, preferring to suggest the strategy, but leave room for the student to make his or her own choice about whether to use it or not. As teachers, our role is to teach and to introduce students to ways of study that would benefit them, but it is also important to try to promote student autonomy and the ability to study and learn in the way most suited to each student.

Although the effectiveness of the strategy was not among our major concerns, the results in Table 5 indicate a correlation between the use of this strategy and the number of correct answers in part 2. An examination of the results of individual students seems to bear this out. Both groups included students who did not copy at all but got some correct answers, which demonstrated that referencing was not necessary for completing the task. However, it was apparent that of the five students who scored 5 or more in the study group, all referenced 5 or more answers from part 1. In the control group, only one student scored 5 or more, and although that student referenced the same number of answers, the two students with the next highest score (4) showed less use of references. In all but two cases in the study group, the number of references was within +/–1 of the number of correct answers. Those two cases displayed the lowest incidence of referencing in the group, 0 and 1 respectively, but not the lowest scores, suggesting a developed ability to work in their own way. In the control group, 4 students fall outside this +/–1 range, though in three of these cases the number of references is greater than that of correct answers.

It is also worth noting that this exercise was part of a course involving many varied activities, and was perhaps uncharacteristic of the mostly oral activities undertaken by the students. The results of the control group do not necessarily mean that the students are less responsive or skilled than those of the study group. In fact, though it lies outside the scope of this study, several of the incorrect answers could be seen as more interesting or attempting something more difficult than 'merely copying' the correct answer.

Conclusion

Although the sample number was too small to make any authoritative claims, the results of this

study support the findings of the previous study which proposed the value of focussed strategy instruction on several points. Firstly, and most directly, the high incidence of copying in the study group appears to be the direct result of instruction. Secondly, instruction also appeared to increase the accuracy with which this strategy was performed. The ease with which the instruction was carried out, when compared to the difference in results between the two groups, is also important, marking it as a successful example of a 'strategic approach' to the use of learning strategies. Although it may not seem remarkable that students, upon receiving a suggestion that they follow a particular approach to a task, demonstrated a greater use of that approach than students who did not receive the same suggestion, the authors believe that it is this simplicity that makes learning strategies effective. It suggests that a variety of instructional methods may be successful if sensitively applied. It is the task of the teacher to be aware of when and where such strategies would be useful, and to develop in students an awareness of what makes an effective approach to learning, rather than weighing them down with arsenals of techniques.

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Appendix 1: Part 1 with dictated questions

Chapter 4

Sports Quiz

1. Which country does Michael Schumacher come from?

2. How many people are there in a baseball team?

3. Where will the 2012 Olympics be held?

4. What popular sport in Britain is similar to baseball?

5. Where did tennis originate?

6. In baseball, what does the C in WBC stand for?

7. Which sport uses a puck and a penalty box?

8. What team does Hideki Matsui play for?

9. What famous manga was written about basketball?

10. In tennis, what do you call it when you have no points?

Appendix 2: Part 2 as it appeared in the students' textbook.

Answer: Write questions that will give these answers.

1. Ashita no Jo

2. Soccer

3. A birdie

4. Formula

5. Japan

6. Beijing

7. Rugby

8. The U.K.

9. Seattle Mariners

10. Eleven