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Applying Metacognitive Strategies to Skimming Research Articles in an ESP Context

In recent years, English language teachers have benefited from a growing body of research that describes how learning strategies can help students improve their acquisition of the language. Teachers and students alike can easily find useful references that list the numerous learning strategies and explain how to apply them to each of the four skills (Oxford 1990). According to O'Malley and Chamot (1990), learning strategies are organized into three main categories: *social-affective, cognitive,* and *metacognitive.* Social-affective strategies include interacting and cooperating with others to assist learning; cognitive strategies involve manipulating the language to be learned; and metacognitive strategies encourage learners to reflect on thought processes and to plan, monitor, and evaluate aspects of their learning.

These strategies can be valuable instructional tools, especially for the reading skill, because many English as a Foreign Language (EFL) teachers find that there is insufficient practice time for students who are required to cope with studying a new language and to read for content. The need is heightened because at the post-secondary level, and particularly at the graduate and post-graduate levels, English suddenly becomes increasingly important for students who must take English for Special Purposes (ESP) courses and read technical subject matter in English. In some subjects English is the medium of instruction and a vehicle of content information. Although there are clear prescriptions from syllabus designers and curriculum developers to encourage activities that require the use of strategies such as *scanning* (reading a text quickly for

specific details), and *skimming* (reading or previewing a text to find the main idea), in many EFL classrooms these terms are no more than clichés, and very little training is provided on how to actually use these strategies. As a result, students experience difficulties when reading research articles in subjects related to science and technology.

In this context, where being able to read efficiently and effectively is essential for academic success, training students to use learning strategies can have a significant effect. Since the goal of metacognitive learning strategies is to strengthen students' awareness of what makes their language learning successful, it is especially important for the reading teacher to understand how to use such strategies. This article will review some research on metacognitive strategies and will present a lesson on how to use them to teach skimming for reading specialized texts in an ESP class.

Metacognition and reading

Grabe and Stoller (2002) indicate that reading long selections of text quickly for general comprehension, which most fluent readers can do in their native language, is difficult to achieve and may not be a skill that is readily transferable to their second language. In the EFL classroom, many readers tend to rely on the slow and careful reading of texts from start to finish, and they have difficulties with reading activities requiring the use of strategies for reading quickly and efficiently, such as skimming a lengthy research article for main ideas (Urquhart and Weir 1998; Weir 1983). As many practitioners have found, metacognitive strategies are one way to overcome these problems.

Metacognition is variously defined as "cognition of cognition" (Carrell, Pharis, and Liberto 1989, 647), "the conscious awareness of cognitive processes" (Bernhardt 1991, 52), and "knowledge about learning" (Wenden 1998, 516). In relation to reading comprehension, metacognition is the "knowledge that takes as its object or regulates any aspect of any cognitive endeavor" (Flavell 1979, 8). This definition suggests that metacognition not only relates to the individual thought processes one uses to learn but also to the self-regulation of cognition. Williams and Burden (1997, 148), for instance, say that metacognitive strategies "include an ability to manage and regulate consciously the use of appropriate learning strategies for different situations. They involve an awareness of one's mental processes and an ability to reflect on how one learns, in other words, knowing about one's knowing." According to O'Malley and Chamot (1990), metacognitive strategies include selective attention to the task, planning, self-monitoring, and self-evaluating. As applied to reading, these metacognitive strategies entail specifying a purpose for reading, planning how the text will be read, self-monitoring for errors in reading comprehension, and self-evaluating how well the overall objectives are being fulfilled, which allows for taking corrective measures if comprehension is not being achieved.

Metacognitive strategy training in reading

Even though students' reading ability can be improved when they discover and use specific learning strategies, research indicates that it is not sufficient to present discrete lists of strategies and suggests that setting up contexts where the reasons for strategy use are made explicit may help readers better appreciate strategies and use them more effectively (Anderson 1991). In other words, even if students receive lectures on strategies and are provided with lists and descriptions, this does not mean that they will incorporate them into the task of learning a foreign language. As Nunan (1999, 11) says, it is "a mistake to assume that learners come into the language classroom with a sophisticated knowledge of pedagogy, or with a natural ability to make informed choices about their own learning processes." However, with strategy training, readers can make concrete gains in their reading (Block 1992). According to Carrell (1998), this training must be clearly sequenced. In addition, there must be a clear rationale for using specific strategies (Oxford 1990). For example, strategy training should include explicit instructions on when and how to use a particular strategy, and should incorporate metacognitive elements of planning, self-monitoring, and self-evaluation into the task. When this is accomplished, metacognitive strategy improves ESP students' efficiency in reading research articles, particularly with tasks requiring fast, selective reading such as skimming (Dhieb-Henia 2003).

Students who identify and solve problems at the vocabulary, clause, and text levels are utilizing the metacognitive strategy for reading, and they are typically "characterized as purposeful, strategic, and persistent in their learning. They possess the ability to evaluate their own progress in relation to the goals they have set and to adjust subsequent behavior in light of those self-evaluations" (Purdie, Hattie, and Douglas 1996, 87). Several studies establish that the best readers are those who engage in such active, conscious reading.

Information processing is a theory that hypothesizes how metacognition makes learning strategies an automatic part of one's cognitive makeup. According to this theory, metacognition is divided into *declarative* and *procedural* knowledge (Anderson 1983). Declarative knowledge refers to knowing what something is but not necessarily knowing how to use the knowledge, while procedural knowledge refers to knowing how to do something or putting the knowledge into action. The transfer of declarative knowledge into procedural knowledge is accomplished by first ensuring that students have a solid knowledge about pertinent learning strategies and then applying metacognition so students reflect on what they know and use planning, self-monitoring, and self-evaluating to make the strategies a part of their long-term learning processes. This idea suggests that it is possible to develop declarative knowledge of the type *{I know what X is},* and then to develop procedural knowledge by applying strategy training to guide students' behavior when reading *{I know how to do Y}*. As declarative knowledge becomes procedural, students will find that first language reading strategies will transfer to the second language more easily.

Establishing a purpose for reading

Second language reading research also suggests that the successful use of reading strategies is less dependent on their availability and more dependent on students' awareness of strategies and their ability to be flexible when using them according to the purpose of the task or the problem to be solved (Carrell, 1998; Carrell, Pharis, and Liberto 1989; Jiménez, Garcia, and Pearson 1996). This indicates that establishing a purpose for any reading activity is crucial to the choice of the reading strategy to be adopted. Indeed, to decide whether to read a text selectively or straight through, and to separate relevant from irrelevant information, one first needs to have a clear sense of the purpose of reading (Anderson 1991).

The research on teaching ESP indicates that the different strategies adopted by scientists reading in their fields are closely connected to the scientists' own agendas; that is their purpose for reading (Bazerman 1985). For example, different purposes may require different approaches to reading, such as scanning the table of contents, reading quickly to get an overall impression of a document, skipping whole parts if the information is familiar, and reading more carefully when something important is spotted.

A metacognitive strategy lesson for skimming

This is a lesson for an ESP classroom with graduate level students who read scientific texts. The objective of this lesson is to instruct students in how to use skimming when reading technical material. The presentation and discussion of the framework takes one ninety-minute session, and the guided practice takes another ninety minutes.

Presentation and discussion

To begin, the teacher brings several research articles of approximately ten pages to the classroom and asks students to select and read an article and to report on the main ideas. After students have been reading for two or three minutes the teacher stops the students and asks for possible answers. Students are likely to show surprise and shock: How could they possibly generate correct answers after having read just the first three paragraphs from the ten-page article? Because the students were using their traditional reading technique, which was a slow, linear reading of the text, they had barely begun the article.

The teacher uses this moment of confusion to start a discussion on why people read, whether it is for the main idea, for specific details, or to find supporting ideas. The teacher then extends the discussion to show that how people read is closely connected to why they read. Contrasting the reading of a train schedule with reading the local newspaper reinforces this point, and the discussion creates an awareness of the different purposes for reading. The students are then asked to speculate on the pur-

poses of reading texts in science and how these purposes may influence the way they approach the technical reading material.

At this point, the teacher explains that skimming is reading quickly to discover the main idea of a text. The class looks at how skimming would be productive for reading in general, such as when working online and needing to decide quickly whether it is worthwhile to download a document. Next, the class discusses how skimming can be used in the research context, such as reading the headings, introduction, and conclusion and gleaning information from any non-textual cues, such as pictures and diagrams.

Guided practice

Figure 1 presents a three-step framework that can help ESP teachers guide students to use skimming with a research article.

Step 1 of the process sets up the general macrostructure of the research article by focusing on its content schemata and discourse features. This helps the students determine the genre, the textual organization, and the rhetorical strategies of the article, and serves to activate any background knowledge and expectations associated with the text. It also helps students recognize any similarities with reading a similar article in their native language, so they can consider the transferability of strategies to the ESP context.

In Step 1, readers ask themselves these preliminary questions:

- What is the topic?
- Am I the intended reader of the article?
- What is the source and date of publication of the article?
- What is the research problem and what is the purpose of the study?
- Does the research article contain headings familiar to me?
- Do these indicators help me activate any relevant background/content knowledge?

The teacher next discusses how a particular genre might affect the manner of reading. For example, reading the headings and subheadings may not always be useful as a reading strategy for research articles because the same general headings are often used—*Introduction, Background, Methods, Results, Discussion,* and *Conclusion.* Therefore, focusing on headings may not provide useful information about the article's content. All these questions are teacher-initiated at the early stages of the course and then, with practice, become a self-initiated

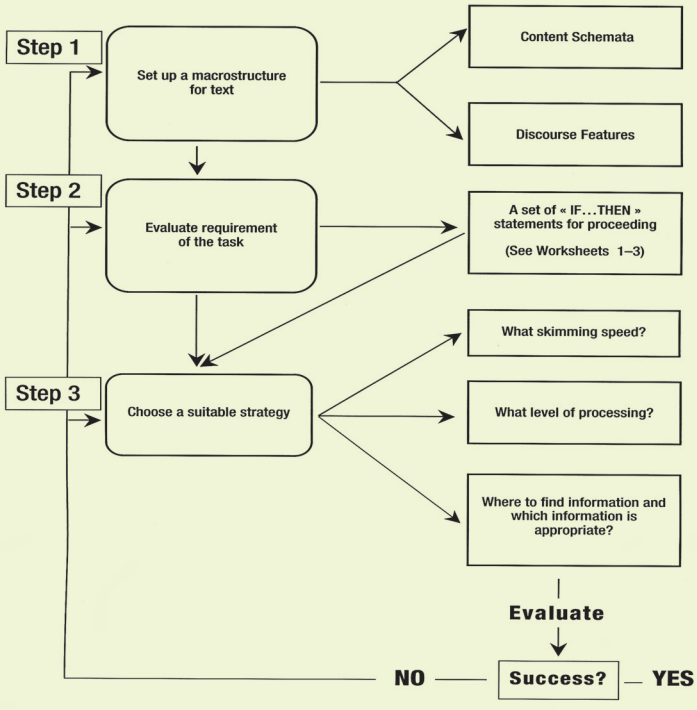

FIGURE 1: A METACOGNITIVE STRATEGY TRAINING FRAMEWORK FOR SKIMMING

competency that students may draw on when engaging in independent reading.

Step 2 asks the student to evaluate the requirement of the task. Here, readers establish goals for their readings, as they realize that skimming is a purposeful activity to determine meaning. The teacher demonstrates to students how they can determine the general idea of a research article by first reading the abstract and then by reading selectively through the whole article. Here three worksheets are used to introduce students to the various skimming choices they can make, which will be contingent on the purpose of the reading. (See Worksheets 1-3.) The different goals and sub-goals on the worksheets are represented by pairs of *IF…THEN* statements, which allow for student involvement in the choice of the skimming strategies.

The use of the worksheets demonstrates a step-by-step process for the different strategies one can use when skimming a research article for main ideas, namely, reading different sections like the abstract, introduction, and conclusion, reading the title and subtitles, reading the first and last lines of a paragraph, and looking at nonverbal information, such as figures and tables, and reading their captions. As students become acquainted with these proposed lists of strategies for handling this task, they may later combine different pairs of *IF…THEN* statements as they monitor and adjust their skimming strategy.

Step 3 provides students with a repertoire of strategic behaviors requiring certain decisions to be taken concerning the reading speed and level of processing to be adopted, which interfaces with the skimming strategies chosen from Step 2. Finally, students engage in the evaluation of the reading outcome and determine if the strategies improved their skimming ability. If their success is not satisfactory, they can begin again at Step 3, the choice of strategy; at Step 2, the assessment of task requirements; or at Step 1, the very beginning of the process of setting up a macrostructure for the text.

WORKSHEET 1

Pair 1	*If*	The goal is to adopt an appropriate strategy and I know that the research article is a special genre
	Then	The sub-goal is to read selectively from the different sections
Pair 2	*If*	The goal is to read selectively from the different sections
	Then	The sub-goal is either: • To skim the text quickly, read more carefully once an interesting piece of information is spotted • To read the first few lines of every paragraph • To pay careful attention to both text and non-text • To follow a personalized combination of some of the previous procedures

WORKSHEET 2

Pair 1	*If*	The goal is to adopt an appropriate strategy and I know that the research article is a special genre
	Then	The sub-goal is to read the abstract
Pair 2	*If*	The goal is to read the abstract carefully and I know that the informative abstract gives me an idea about the different sections in the research articles
	Then	The sub-goal is to read every sentence in the abstract carefully and glean the information from it

WORKSHEET 3

Pair 1	*If*	The goal is to adopt an appropriate strategy and I know that the research article is a special genre
	Then	The sub-goal is to read the introduction and the conclusion and have a quick look at figures, tables, and their captions
Pair 2	*If*	The goal is to read the introduction and I know that introductions in research articles follow certain generic patterns
	Then	The sub-goal is to read and identify the purpose of each sentence
Pair 3	*If*	The goal is to read the conclusion
	Then	The sub-goal is to collect information on the results found and to check whether the objectives of the study were fulfilled or not

This lesson was initially used with postgraduate level ESP students in the biology specialty area, and the results of this strategy training lesson for reading generated a number of reactions. The comments from students who underwent this metacognitive strategy training revealed that it had a major impact on their reading behavior. Some students stated that the skimming strategy was very efficient and allowed them to find the required information without having to read the whole scientific article. They also stated that learning to skim was more effective than traditional methods of reading instruction.

Conclusion

Language learning strategies are a valuable addition to the challenging task of learning and teaching a second language. Students can benefit from these strategies, but it cannot be assumed that merely presenting them as lists will make them a permanent part of successful learning. Teachers need to help students see how they can develop and transfer such knowledge into "rules for action" (Johnson 1996), that is, into successful procedures for undertaking a specific task. Metacognitive strategy training fulfills this objective by helping learners incorporate the strategies in a meaningful way that transforms students' declarative knowledge of reading strategies into procedural knowledge. This is especially important for ESP courses because reading efficiently is a critical skill that is directly related to many students' career paths. Although this example of strategy training was for skimming, practitioners will find the framework and worksheets applicable to other reading strategies, such as scanning and vocabulary enrichment, and to other activities associated with speaking, listening, and writing skills.

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