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Metacognition in the classroom

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Abstract

Understanding students' capacity to direct their own learning has been a central topic of discussion among educational practitioners. Researchers argue that the capacity to self-regulate is central to our assumptions about learning, decision making, problem solving, and resource management in education. Basic research questions are "What is self-regulation?" and "what is metacognition?". In this paper, we first look at various conceptualisations of self-regulation prominent in the educational psychology research literature, then discuss the metacognitive strategies which will enhance their self regulation and compare and contrast the university students' use of metacognitive strategies in the mother tongue and target language.

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1. Metacognition and self regulation

Understanding students' capacity to direct their own learning in school and beyond has been a central topic of discussion among practising educators, policy-makers, and educational researchers alike. Researchers argue that the capacity to self-regulate is central to our assumptions about learning, decision making, problem solving, and resource management in education, and they have promised assessment instruments and intervention programs to promote self-regulation and make learners use their metacognitive strategies. Basic research questions are "What is self-regulation?" and "what is metacognition?". In this paper, we first look closely at various conceptualisations of self-regulation that are prominent in the educational psychology research literature, then discuss the metacognitive strategies which will enhance their self regulation and compare and contrast the university students' use of metacognitive strategies in the mother tongue and target language.

The notion of metacognition originated in the context of information processing studies in the 1970s. One of the first descriptions of metacognition comes from Flavell (1976), who describes it as 'one's knowledge concerning one's own cognitive processes and products or anything related to them'. He also asserted that metacognition includes 'the active monitoring and consequent regulation and orchestration' of information processing activities (Flavell, 1976, p. 232). Baird (1990, p.184) used these ideas to provide the following succinct formulation:

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‘Metacognition refers to the knowledge, awareness and control of one’s own learning’. Metacognitive development can therefore be described as a development in one’s metacognitive abilities, i.e. the move to greater knowledge, awareness, transfer of the knowledge and control of one’s own learning.

Gunstone (1994) stresses that all learners are metacognitive and that the associated pedagogical goal should be to enhance metacognition. He suggests that enhanced metacognition is a learning outcome in itself, as well as having a critical impact on the achievement of content-based learning outcomes. He argues that enhanced and appropriate metacognitive abilities will only be achieved by means of an integrative perspective on metacognition, in which metacognitive training is recognised to be intimately bound up in issues of content and context. Some attempts have been made to teach metacognitive skills apart from the context and content within which they are to be used, in so-called ‘study skills’ programmes. This approach rests on an assumption that students will be able to transfer these skills from one context to another.

Self-regulated learning, or self-regulation, on the other hand, is “an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features in the environment” (Pintrich, 2000b, p. 453). Part of the impetus for studying academic self-regulated learning came from research showing that learners’ skills and abilities did not fully explain student achievement (Zimmerman, 2001), which suggested that factors such as self-regulation and motivation were important. Applying self-regulation to education also broadened its scope beyond the historical emphasis of performance of previously learned actions to actual learning. Our premise is that college students, who are the focus of this paper, have a distinct set of academic goals related to typical academic tasks, and that their knowledge and use of strategies will reflect those factors. College students are responsible for a variety of assignments, from answering questions at the end of a chapter to writing summaries of course topics. The successful completion of these tasks depends on reading.

Research also shows that interest and value relate to self-regulation. Students with greater personal interest in a topic and those who view the activity as important or useful are more likely to use adaptive self-regulatory strategies (Pintrich & Zusho, 2002). Research is needed to explore the process whereby these effects occur. We might expect that because interest and value relate positively to perceptions of competence that these students are more likely to set goals and assess their learning progress, which builds self-efficacy and furthers learning. Metacognitive research has shown that metacognition is an important predictor of academic performance; students are able to effectively distinguish information they know and do not know are more likely to review and retain new information (Dunning, Johnson, Ehrlinger, & Kruger, 2003; Dunslosky & Thiede, 1998; Kruger & Dunning, 1999). Metacognitive research has also proved that metacognitive training, even if administered for a short time, can improve performance considerably (e.g., Nietfeld & Schraw, 2002; Thiede, Anderson, & Theriault, 2003). Even more encouraging is that academically weak students are found to benefit from metacognitive training (White & Frederiksen, 1998). Since all students do not spontaneously engage in metacognition, some require explicit training and coaching to learn such skills (Chi, Bassok, Lewis, Reimann, & Glaser, 1989; Lin & Lehman, 1999). In this paper, the aim is to see whether students use the metacognitive reading strategies in the target language and mother tongue without prior training.

2. Method

2.1 Participants

Participants are 41 junior college students (34 girls, 7 boys) and their ages range from 19 years to 21 years. On arrival, participants signed an informed consent form. They were told that the purpose of the experiment was to understand the learning process. Participants completed a survey comprising a metacognition measure. Participants were instructed to reflect on their classes when responding to the items in order to provide participants with a basis for answering questions regarding their learning techniques and study habits.

2.2 Data Gathering Instruments

The Metacognitive Reading Strategies Questionnaire prepared by Taraban and his friends (2004) is used to determine whether students use them in English and Turkish texts. First, they are given the texts in the target language and mother tongue and the questionnaire is administered to them to test the hypothesis whether students

use the same metacognitive strategies in the target language mother tongue. The MRSQ is a self report measure of reading strategies created through summarizing the major reading strategies in 42 published reports used by the same age group learners. Taraban et al found that the self report metacognitive reading strategy questionnaire discriminated between students with higher and lower GPAs. The questionnaire's Cronbach alpha reliability was found to be 0.82.

2.3 Findings

Regarding the analysis of the scale measuring metacognitive reading strategies in English, there are some differences of the frequency of the students' using metacognitive reading strategies. The most frequently used metacognitive strategies are underlining and highlighting, reading, inferring, guessing, taking notes, visualizing the topic and drawing on the previous knowledge.

The independent –samples t-test is conducted to compare the metacognitive reading strategies questionnaire results for males and females and there is no significant difference in scores for males (M:86.5, SD:7.7) and females (M:84, SD:5.7).

Table 1: Means, standard deviations and t-test results according to gender

Gender	n	Mean	Std Dev	Sd	t-value	Importance
Girls	34	84	5.7	39	0.5	Insignificant
Boys	7	86.5	7.7			

A one-way between groups analysis of variance is conducted to explore the impact of the metacognitive reading strategies on the grades of students. Students are divided into four groups : very good, good, fair and slow learners. It is clear that there is no significant difference in the scores of students regarding their reading grades.

Table 2: Anova Results of the Impact of the Metacognitive Reading Strategies on Students' Achievements

Sources of Variance	Sum of Squares	Degree of Freedom	Mean Square	F	Sig	The Level of Significance
Between groups	50.241	3	16.747	0.286	0.836	P<0.01
Within groups	2170.150	37	58.683			
Total	2220.390	40				

When it comes to the mother tongue, the results are almost the same for each category. Underlining in English texts becomes the most frequent strategy in Turkish. Visualizing goes one notch up in Turkish.

The independent –samples t-test is conducted to compare the metacognitive reading strategies questionnaire results for males and females and there is no significant difference in scores for males (M:88.5, SD:7.1) and females (M:81, SD:6.3).

Table 3: Means, standard deviations and t-test results according to gender in Turkish texts

Gender	n	Mean	Std Dev	Sd	t-value	Importance
Girls	34	81	6.3	38	0.4	Insignificant
Boys	7	88.5	7.1			

3. Conclusions

The study shows that the use of metacognitive reading strategies in Turkish and English does not show significant differences and students use the same strategies in the same frequency in both the target language and mother tongue. Regarding grades this study differs from Taraban's study as fair and underachievers use the metacognitive strategies frequently as well as the high achievers. From this result, we can conclude that students are aware of which metacognitive reading strategies are used. However, the reason why they fail in reading is their vocabulary range may be limited and they may not have regular study habits and self regulatory strategy use which is considered as essential for cognitive information processing (Zimmerman & Schunk, 2001). When 2 students

whose grades are low and 16 students whose grades are fair are interviewed, they say that they are aware of the metacognitive strategies but they do not plan and schedule daily study habits and they show no persistence in learning and easily give up. The self regulatory model developed by Pintrich may be thought of as a social-cognitive framework, although it incorporates elements from other theories such as cognitive information processing (Zimmerman & Schunk, 2001) for a discussion of different theories of self-regulation and it seems that students lack the self regulatory strategies. Pintrich believes that self-regulatory activities mediate the relations between learners and their environments and influence learners' achievements (Pintrich, 2000b; Pintrich & Zusho, 2002). His model comprises four phases of self-regulation and, for each phase, four possible areas for self-regulation. The phases of self regulation are :

--forethought, planning activation: Cognitions that can be self-regulated during this phase include goals, prior content knowledge, and metacognitive knowledge. Activation of metacognitive knowledge, which also can occur automatically or through deliberate conscious control, includes declarative knowledge (e.g., of learning strategies such as rehearsal and note taking), procedural knowledge (how to implement these strategies), and conditional knowledge (when and why to use different strategies).

--monitoring: The second phase is monitoring, or attention and awareness of one's actions and their outcomes. Pintrich (2000b) viewed cognitive monitoring as including dynamic metacognitive judgments of learning and metacognitive awareness (feeling of knowing). Judgments of learning involve beliefs about what one knows and what one does not understand. Feeling of knowing occurs when students believe they have some understanding of material, perhaps because they previously studied it. Motivational monitoring refers to being aware of one's self-efficacy, values, attributions (perceived causes of outcomes), interests, and anxieties.

--control: Control. During this phase learners attempt to control their cognitions, motivation, behaviors, and contextual factors based on their monitoring with the goal to enhance learning. Cognitive control and regulation include cognitive and metacognitive activities that learners use to adapt and change their cognitions (Pintrich, 2000b). Through cognitive monitoring learners assess their goal progress. They continue to use strategies that are deemed effective or alter or replace them if they believe better strategies are needed.

--reflection: Learners' reflections and reactions include judgments, attributions and self evaluations of performance. Motivational reactions include efforts to enhance motivation when learners judge that their motivation has slackened. These may include attributing low performance to insufficient effort rather than low ability. Motivational reactions also can involve emotions, as when learners feel pride after succeeding or anger when they fail. Only by activating these procedures is it possible to ensure that students' metacognitive strategies are helpful to enhance their reading progress.

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