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COMPARISON OF TEACHERS AND STUDENTS SELF PERCEPTION ABOUT METACOGNITION: EMPIRICAL EVIDENCE FROM PAKISTAN

(ÜSTBİLİŞSELLİK HAKKINDA ÖĞRETMENLERİN VE ÖĞRENCİLERIN KENDİ ALGILARININ KARŞILAŞTIRILMASI: PAKISTAN'DAN AMPIRIK BULGULAR)

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ABSTRACT
This paper reports the outcomes of the study conducted on measuring perception of teachers and students about metacognitive awareness. This was co-relational study conducted in 20 secondary schools. 300 students of grade X and 20 science teachers participated in the study. Metacognitive awareness was measured using metacognitive inventories. It was found that some specific teacher skills (of a metacognitive nature) were correlated with student metacognitive awareness. This study has further revealed the very complex nature of metacognition. However, it is obvious that thinking about thinking is a useful skill in its own right and its development as an integral part of the whole process of learning may be very important. This study has offered some insights, guidelines and caveats for future research.

Key words: Metacognition; metacognitive awareness; Metacognitive perception

ÖZ
Bu makale, öğretmenlerin ve öğrencilerin üstbilişsel farkındalık hakkındaki algılarını ölçmek için yapılan çalışmanın sonuçlarını sunmaktadır. Bu 20 orta dereceli okulda yapılan korelasyonel bir çalışmadır. 300 X. Sınıf öğrencisi ve 20 fen öğretmeni katılmıştır. Üstbilişsel farkındalık, üstbilişsel anketler kullanılarak ölçülmüştür.. Bazı özel öğretmen becerilerinin (bir metabilişsel bir yapıda) öğrenci üstbilişsel bilinci ile ilişkili olduğu tespit edilmiştir. Bu çalışma üstbilişin, çok karmaşık doğasını ortaya koymuştur. Ancak, açıktır ki düşünmeyi düşünme kendi çapında çok önemli bir beceridir ve onun gelişimi tüm öğrenme sürecinde çok önemli bir parçası olabilir. Bu çalışma, bazı anlayışlar, kurallar ve gelecekteki araştırmalar için uyarılar sunmaktadır.

Anahtar Sözcükler: Üstbiliş, stbilişsel farkındalık; üstbilişsel algı

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INTRODUCTION

Metacognition is significant part of human abilities. Firstly, if learners are not aware of when comprehension is breaking down and what they can do about it, teacher's strategies will fail. Secondly, students without metacognitive approaches are basically learners without direction to review their progress, accomplishments, and future directions (O'Malley, *et al*, 1985). Pressley, Synder and Cariglia (1987) suggest that metacognition helps students to be consciously aware of their learning, understand situations in which it would be useful, and processes involved in using it.

The study of metacognition has provided insight about the cognitive processes of learning and what discriminates successful students from less successful. It also has several consequences for instructional interventions, such as teaching students how to be aware of learning processes and product, and how to regulate those processes (Livingston, 1997). The metacognitive process can improve learning by guiding students' thinking, and by helping the learners to follow a sensible strategy as they think through a problem, make decisions, or attempt to understand a text. In this era of technology, the challenge of teaching is to help students develop skills to become lifelong learners.

Literature Review

Metacognition has been defined in many ways and encompasses various dimensions. That is why metacognition has been considered as a fuzzy concept (Flavell, 1981, p37; Wellmann (1981, as cited by Brown, 1987, p. 106) as it is related to different disciplines (cognitive psychology, developmental psychology, philosophy of mind), and thus has been examined for various purposes from various standpoints. These viewpoints are discussed in below paragraphs:

Hudgins, Phye, Schau, Theisen & Ames (1983, pp. 68-73) described that metacognition is a cognitive skill which involves not only memory monitoring but also the monitoring of comprehension, problem solving and other cognitive skills. Howard, McGee, Shia & Hong (2000) found that metacognitive awareness and regulatory skills comprised of five independent factors: knowledge of cognition, objectivity, problem representation, sub-task monitoring and evaluation.

Kuhn, Amsel, and O'Loughlin (1988) noted that main aspect of metacognitive operations involve "*conscious awareness*": the ability to think about a theory rather than only with it (p. 219). In other words, people are metacognitive when they make their own thoughts "*objects of cognition*" (Kuhn, *et al.*, 1988). Baird, Fensham, Gunstone, and White (1991) have described metacognition as,

> "A person's knowledge of the nature of learning, effective learning strategies, and his/her own learning strengths and weaknesses; awareness of the nature and progress of the current learning task (i.e. what you are doing and why you are doing it); and control over learning through informed and purposeful decisions making" (p.164).

Brown & Baker's (1986) states that metacognition refers to one's understanding of any cognitive process. On the other hand while referring metacognition, Swartz and Perkins (1989, p.52) and Ashman & Conway (1997, p.135) distinguish four levels of thought that are increasingly metacognitive:

(i) *Tacit* It is unconscious thinking about a strategy.
(ii) *Aware* It is the conscious use and awareness of a particular strategy.
(iii) *Strategic* It refers to organization of thinking through planned process.
(iv) *Reflective* It is intentional and careful planning, monitoring and evaluation of a process.

Biehler & Snowman (1986, pp. 435-436) defined metacognition as "*It concerns what we know about our own thought processes and how that knowledge, or lack of it, affects learning."* Davidoff (1987, p. 244) defines metacognition as knowledge about knowledge. He further elaborated that one may observe that a person learns more easily by seeing than by hearing something or forms impressions about their nature: boring? difficult? easy? etc

Many researchers stress that metacognition is best defined by recognizing that it is both knowledge about, and control over, thinking processes (Allen & Armour-Thomas, 1991). Vadhan and Stander (1993) clearly distinguish between ordinary thinking and awareness and understanding of thinking. However, Hacker (1998) divided metacognition into three types of thinking:

(a) *Metacognitive knowledge*: What one knows about knowledge?
(b) *Metacognitive skill*: What one is currently doing?
(c) *Metacognitive experience*: One's current cognitive or affective state.

Nelson (1992) on the other hand, divided metacognition into two broad categories: knowledge of cognition and regulation of knowledge. Knowledge of cognition refers to what people know about their own cognition or about cognition in general. It includes declarative knowledge (knowing about things), procedural knowledge (knowing how to do thing) and conditional knowledge (the why and when aspect of cognition). Collin (1994) described

metacognition as thinking about thinking. He further elaborated that a person who can think metacognitively is able to reflect on his/her reasoning. Child (1995, p.136) defined metacognition as, "The concept of a person self consciously examining his/her mental processes, becoming aware of problems and adjusting accordingly in order to improve effectiveness." While Shimamura (2000) referring it to, "evaluation and control of one's cognitive processes. In this way, metacognition often suggests conscious control of thoughts, memories, and actions." Luca & McMahon (2004) stated that, "metacognition is widely considered integral to effective learning. However environments that support metacognition can be difficult to develop."

Darling-Hammond *et al* (1998) identified two aspects of metacogniton: reflection and self-regulation: (i) Reflection is thinking about what we know; and (ii) Self-regulation is managing how we learn.

Hunt and Ellis (2004, pp. 234-235) described that 'Meta' can refer to any aspect of cognition, such as meta-language (cognition about language) and meta comprehension (cognition about comprehension). They described three aspects of metacognition: knowledge, monitoring and control.

(1) *Metacognitive knowledge* is concerned with people's declarative knowledge about memory and may include implicit and sometimes inaccurate beliefs. For example, some people believe their learning ability has declined more significantly in old age than it actually has (Hertzog & Hultsch, 2000).
(2) *Monitoring* involves assessing the progress of any aspect of learning and retrieval. For example, while studying for an examination, a student may assess how well they are learning each section of their class notes, and, while taking the exam, they may assess whether their response to each question is correct.
(3) *Control* involves the regulation of ongoing learning and retrieval processes. Examples of control are when students regulate learning by deciding to stop studying a section of their notes that they believe they know well, and they decide to keep trying to retrieve an answer to a test question even when they cannot initially recall it.

Another researcher Hennessey (1999) identified five characteristics of metacogniton:

(1) A knowledge of the content of own thinking.
(2) An awareness of own conception.
(3) Monitoring of own cognitive process
(4) Regulation of one's cognitive processes with respect to further learning.

(5) An application of a set of heuristics for helping people organizes their method to solve problems.

Similar to Flavell, Paris and Parecki (1993) divided metacognition into self-appraisal and self-management. Self-appraisal of the cognitive process includes three kinds of knowledge: declarative knowledge or what affects the learning; procedural knowledge, or how the strategies operate; and conditional knowledge, which is the understanding of why and when to use strategies. Their self-management is similar to Anderson's, incorporating planning, evaluation and regulation. Peters (2000) defined metacognition as quoted by Imel (2002, p.1): "*It refers to the ability of the learners to be aware of and monitor their learning processes.* Bogdan, (2000), Flavell, (1999) & Mecalfe, (2000) argue that the definition of metacogniton as thinking about thinking requires further explanation. They see metacognition involving knowing how to reflect and analyze thought, how to draw conclusions, and how to put learning into practice. In order to solve problems, students often need to understand how their mind works, i.e.; need to observe how they perform important cognitive tasks such as remembering, learning and problem solving.

It is evident that different fields and researchers have defined metacognition differently. Although metacognition has been a part of discussion of educational psychologists for more than twenty years, but a clear definition of metacognition, is still not agreed upon. However, researchers agreed to divide it into two constructs: metacognitive knowledge and metacognitive control and regulation. Metacognition is an important concept both for teachers and students to evaluate their background knowledge related to the topic under consideration. It enables them to identify what is new knowledge and establish a connection between new and previous knowledge.

OBJECTIVES OF THE STUDY

The main objectives were to:

1. Measure perception of teachers and students about metacognition
2. Find difference between metacognitive awareness of teachers and students.

RESEARCH METHODLOGY

This was a co-relational research. Metacognition of teachers was assessed using metacognitive inventories. Before administering the instruments, in a meeting with school teachers and students, the objectives of

and application procedure was discussed. The respondents were asked to read the statements carefully and indicate their response by tick marking the appropriate box. They were told that there are no right and wrong answers to the statement in the inventory. They were further asked to rate themselves on use of metacognition as accurately and honestly as they could. Average completion time for the inventory was ten minutes.

Instrumentation

The study adapted Schraw and Dennison, 1994 inventory because it is a reliable and valid instrument available. Separate inventory used for teachers and students. Each of the inventories consisted of 37 items representing two components of metacognition: knowledge of cognition and regulation of cognition. The knowledge of cognition included declarative knowledge, procedural knowledge and conditional knowledge while the regulation included planning, management strategies and evaluation. Both of the inventories was a five point likert scale ranging from "Always" to "Not at all" in which the participants were asked to tick appropriate box. In order to measure validity and reliability of the inventory a pilot test was conducted. After pilot test the inventory was administered to the samples of the study.

Participants

Random sampling technique was used to select the sample of the study. A total of 20 science teachers and 300 students of grade X participated in the study. The samples were selected from boys and girls secondary schools equally.

DATA ANALYSIS

After collection of data, various analyses were conducted. This part of the paper discusses the statistical analyses of the research data. The metacognitive inventories of science teachers and students were analyzed separately. There is a real problem in handling the data. The original inventory assumed eight areas and assumed that the questions in each of these areas all reflected the same variable. In the literature, these kinds of assumptions are often made and the data analyzed accordingly. Nonetheless, such methods are fundamentally flawed. In this study, an alternative method is introduced and used.

It is also possible to look at patterns of teacher responses to see if they relate to the student responses in the same questions, again using Kendall's Tau-b. The survey for the teachers included six suggested areas (Procedural knowledge, Declarative knowledge, Conditional knowledge, Planning,

Management Strategies and Evaluation). The student survey also included six areas. It is possible to correlate the responses of every question in the teacher survey with every question in the student survey. This gives a total of 1369 [37 x 37] possible correlation values, an unmanageable number. It is more appropriate to limit the correlations to each of the six groups answered by both students and teachers: for example, in the area entitled procedural knowledge, student responses to each of the four questions can be correlated with the teacher responses to each of the four questions. This still gives a set of 263 possible correlations. The question being explored here is: is there any evidence that the characteristics indicated by teachers (in relation to metacognition) are related in any way to the characteristics indicated by the students, in each of the six areas. It might be suggested that teacher characteristics will be reflected in the characteristics of their own students?

Table 1. Possible and Actual Correlations

	Possible Correlations	***Correlations above 0.10***
Procedural knowledge	16	6
Declarative knowledge	36	7
Conditional knowledge	16	3
Planning	25	1
Management strategy	121	5
Evaluation	49	8
Total	**263**	**30**

Table 1 shows the number of possible correlations for each area and the number which are at or above 0.10 (chosen arbitrarily as a reasonable minimum).

Table 2. Teacher and Student Self-perceptions

Teacher Question	**Student Question**	**Kendall's Tau-b Correlation p<0.001**
I have a specific purpose for each strategy I use.	I try to use strategies that have worked in the past.	0.15*
I have a specific purpose for each strategy I use.	I find myself using helpful learning strategies automatically.	0.17*

I am aware of what strategies I use when I teach.	I try to use strategies that have worked in the past	0.10*
I find myself using helpful teaching strategies automatically.	I try to use strategies that have worked in the past	0.13*
I find myself using helpful teaching strategies automatically.	I find myself using helpful learning strategies automatically.	0.17*
I find myself using helpful teaching strategies automatically.	I am aware of what strategies I use when I study.	0.11*
I understand my intellectual strengths and weaknesses.	I know what kind of information is most important to learn.	0.11*
I understand my intellectual strengths and weaknesses	I know my strengths and weaknesses	0.11*
I am good at organizing information.	I learn more when I am interested in the topic.	0.14*
I am good at remembering information.	I learn more when I am interested in the topic.	0.14*
I am good at remembering information.	I know what kind of information is most important to learn.	0.11*
I am good at remembering information.	I can learn best in the morning.	0.16*
I teach more when I am interested in the topic.	I learn more when I am interested in the topic.	0.11*
I use different teaching strategies depending on the situation.	I use different learning strategies depending on the situation.	0.11*
I use different teaching strategies depending on the situation.	I know when each strategy I use will be most effective.	0.11*
I use different teaching strategies depending on the situation.	I use my intellectual strengths to compensate for my weaknesses.	0.10*

I set specific goals before I begin a task.	I set specific goals before I begin a task.	0.13*
I consciously focus my attention on important information.	I slow down when I encounter important information.	0.10*
I consciously focus my attention on important information.	I try to translate new information into my own words.	0.11*
I try to break lesson down into smaller steps	When I do not understand something I ask others / teachers for help.	0.11*
When there is confusion, I stop and reteach.	I try to translate new information into my own words.	0.13*
When there is confusion, I stop and reteach	When I do not understand something I ask others / teachers for help.	0.13*
I ask myself if I have considered all options after I solve a problem	I ask myself if I have considered all options after I solve a problem.	0.14*
I ask myself if there was an easier way to do.	I ask myself periodically if I am meeting my goals.	0.15*
I ask myself if there was an easier way to do.	I ask myself if I have considered all options after I solve a problem.	0.11*
I ask myself if there was an easier way to do.	After I finish my work I repeat the most important points in order to be sure I have learned them.	0.11*
I ask myself how well I accomplish my teaching goals once I am finished	I ask myself periodically if I am meeting my goals.	0.11*
I ask myself how well I accomplish my teaching goals once I am finished	After I finish my work I wonder whether I have learned new important things	0.13*

I ask myself how well I accomplish my teaching goals once I am finished	After I finish my work I repeat the most important points in order to be sure I have learned them.	0.11*
I know how well students have learned once I finished teaching	I summarize what I have learned after I finish.	0.12*

Table 2 shows the questions where the correlations are significant and at or above 0.10. The question combinations where the correlations are above 0.10 are shown under the six categories. Looking at table, the first thing to note is that correlations above 0.10 occur in only 30 out of a possible 263 possible question combinations. This suggests very strongly that meta-cognitive aspects of teacher behaviour are not readily influencing student metacognition. Indeed, of the 30 correlations above 0.10, most are very low and none are above 0.20. In terms of the skills implicit in the 37 questions, there is a very low relationship between any teacher and student self-perceptions. All of this undermines any suggestion that students neatly reflect the behaviour patterns of their teachers.

ANALYSES USING CHI SQUARE

It is possible to look at patterns of responses for questions one by one to see if there are any differences by gender or between students and teachers. In the following tables, '5' represents the most positive agreement with the statement and '1' represents the least positive agreement with the statement. Chi-square is used as a contingency test (no control group) to compare frequency patterns. For clarity, all data are shown as percentages to the nearest whole number. However, all statistical calculations are carried out using the actual frequency data. In all the tables, N (students) = 300; N (teachers) = 20, male and female being 50% in each case.
Looking at the data this way allows several general observations to be made:

(a) What is the general pattern of responses?
(b) Are there student-teacher differences?
(c) Are there any gender differences?

Table 3. Perception about Procedural knowledge

Statement	Group	% Responses					χ^2	p
		1	2	3	4	5		
I try to use strategies that have worked in the past.	*Teachers*	0	0	16	61	23	40.3	< 0.001 df(2)
	Students	1	1	18	33	47		
I have a specific purpose for each strategy I use.	*Teachers*	0	3	8	41	49	25.9	< 0.001 df(3)
	Students	1	2	29	30	39		

Four questions were designed to focus on procedural knowledge. In all four questions, the teachers consider themselves to be confident in their awareness and use of teaching strategies. However perception on two statements differs significantly. The teachers were more confident about use of strategies that have worked in the past. Of course, the teachers can draw on a much longer range of experience, the students perhaps being over-confident about past experiences. Similarly in the second item, in every group, the majority is tending to agree with this statement. This reflects the fact that it is difficult for people to admit that they not have purposes for what they do. As might be expected, teachers are much more positive than students.

Table 4. Perception about Declarative Knowledge

Statement	Group	% Responses					χ^2	p
		1	2	3	4	5		
I understand my intellectual strengths and weaknesses.	*Teachers*	5	7	5	37	47	67.6	< 0.001 df(3)
	Students	1	2	5	17	75		
I am good at organizing information.	*Teachers*	0	1	3	51	45	2.2	ns
	Students	2	4	25	30	38		
I am good at remembering information.	*Teachers*	0	1	1	62	37	2.8	ns
	Students	3	15	11	19	52		

Six questions were designed to focus on declarative knowledge. All groups say they are keenly aware of their intellectual strengths and weaknesses, the students even more than the teachers. Again, it is unlikely that many will ever admit not being able to understand their intellectual strengths and weaknesses. As might be expected, almost every teacher expresses confidence in his ability to organize information. Although chi-square cannot reveal it, the students do appear to be much less confident in this skill. The teachers are a highly selected group, many possessing several degrees, success in which depended heavily on accurately recall of information. It is, therefore, unsurprising that they see themselves as very good at remembering. Students are more divided; with some very confident in this skill while others (perhaps about 25%) show marked lack of confidence.

Table 5. Perception about Conditional Knowledge

Statement	Group	% Responses					χ^2	p
		1	2	3	4	5		
I use my intellectual strengths to compensate for my weaknesses.	*Teachers*	0	3	7	53	38	32.5	< 0.001 df(4)
	Students	1	3	21	31	44		
I know when each strategy I use will be most effective.	*Teachers*	0	1	8	64	28	45.8	< 0.001 df (4)
	Students	1	3	18	34	44		

There is an overall very strong agreement with two of the statements here with all groups, relating to self aware about the use of intellectual abilities to compensate for weaknesses. The picture is unrealistically optimistic and almost certainly cannot reflect reality. If were true, the education provision would have reached some kind of utopia. However, this is how the respondents see themselves and perhaps reflects what they would like to be able to achieve. Further teachers are overwhelmingly confident of their ability in using strategies while the students are still very confident. It is highly unlikely that the actual situation is as positive.

Table 6. Perception about Planning

Statement	**Group**	**% Responses**					**χ^2**	**p**
		1	2	3	4	5		
I set specific goals before I begin a task.	*Teachers*	1	1	9	45	44	15.1	< 0.01 df(4)
	Students	2	5	16	30	48		
I read instructions carefully before I begin a task.	*Teachers*	1	2	14	42	42	19.3	< 0.001 df(4)
	Students	4	4	27	28	37		
I organize my time to best accomplish my goals.	*Teachers*	1	0	11	41	47	20.3	< 0.001 df(4)
	Students	4	3	15	25	54		

In three of the statements, there is a very strong level of agreement with all groups. All groups strongly support that they set specific goals before beginning a task, reading instructions and organizing their time. Again, it is difficult not to agree without seeming to admit some kind of incompetence.

Table 7. Perception about Management Strategies

Statement	Group	% Responses					**χ^2**	p
		1	2	3	4	5		
I slow down when I encounter important information.	*Teachers*	10	3	28	36	23	61.4	< 0.001 df(4)
	Students	2	3	15	31	49		
I try to translate new information into my own words.	*Teachers*	0	2	8	39	51	43.3	< 0.001 df(4)
	Students	8	3	24	37	28		

I try to break lesson down into smaller steps.	*Teachers*	0	0	17	43	40	24.5	< 0.001 df(4)
	Students	3	8	26	31	33		
I think about several alternatives to a problem before I answer.	*Teachers*	0	3	15	67	16	73.8	< 0.001 df(4)
	Students	1	2	17	30	49		

It is not easy to bring together the responses to such a diverse set of statements. Indeed, in some of the questions, it is clear that the teachers are interpreting the questions in two ways. What is clear is that teachers are aspiring to what they see as best practice. In looking at the responses of the students, there are clear signs of variable learner characteristics. The importance of the visual-spatial emerges and this is well documented elsewhere (eg Silverman, 1997). There is also clear evidence of the fact that some students tend to skim while others look at details, both useful ways of approaching complexity. What is obvious in some questions is that the students are reacting in totally understandable ways in response to an educational culture where the recall of the maximum amount of information brings the greatest rewards. They are there to receive information they need to press on to cover as much as possible.

All indicate that they try to do this. It is inevitable in that the limited capacity of working memory makes large steps or sequences of ideas more or less impossible to handle in terms of understanding. As the role of the teacher is to teach and make ideas accessible, they are more positive than the students whose role is more that of acceptance. Inevitably, all groups strongly agreed with the statement. To admit the alternative is like admitting to facing a problem with a fixed, almost blind, attitude. There is a significant difference between teachers and students, reflecting maturity and experience.

Table 8. Perception about Evaluation

Statement	Group	% Responses					$\chi 2$	p
		1	2	3	4	5		
I ask myself if I have considered all options after I solve a problem.	*Teachers*	2	1	18	52	28	11.1	<0.05 df(4)
	Students	2	4	18	34	42		

Seven questions were designed to focus on evaluation. However, what they do is to throw light on the desire for teachers to do sensible things for the benefit of students and the reactions of students in their attempt to be successful. The power of assessment is enormous in that examination performance determines so much for the future of students. On a much larger front, there are real questions to be addressed. To what extent is assessment measuring what is important? Is the assessment approach, based on written papers, the most effective way to measure performance? There is the real possibility (perhaps probability) that assessment is determining most of the emphases in an entire learning program. In every group, the majority agreed with the statement. As might be expected, there is a significant difference between teachers and students, almost certainly because students face examinations and want good marks: they, therefore, check answers carefully.

CONCLUSION

In looking at the response patterns of the teachers in the 37 questions and the response patterns of the students in the 37 questions, in each of the six areas of the original survey, it was found that correlations above 0.10 ($p < 0.001$) occurred in only 30 out of a possible 263 possible question combinations and all the correlations were very low. This suggests very strongly that meta-cognitive aspects of teacher behaviour are not readily influencing student metacognition.

The actual distributions of responses in all 37 questions for both teachers and students were considered. In only 3 of the questions for teachers was there an appropriate spread across all five categories. Thus, the two least positive categories carried between them less than 10% in 34 questions, with many of them giving less than 5%. With the students, 6 questions offered a reasonable spread of responses, the remaining 31 showing extremely low

responses for the two least positive categories. Overall, this reveals that the questions were not discriminating well, perhaps explaining the low correlations obtained. The pattern of teacher and students responses in each of the six areas can be summarized in table9.

Table 9. Summary of Views of Respondents

	Teachers	**Students**
Procedural knowledge (Questions 1-4)	Consider themselves to be confident in their awareness and use of teaching strategies	Consider themselves to be confident in their awareness and use of learning strategies
Declarative knowledge (Questions 5-10)	Extremely confident of their abilities	Mostly confident but significant minority lack confidence
Conditional Knowledge (Questions 11-14)	Unrealistic confidence to self-motivate, recognize and employ appropriate strategies and be self aware about the use of intellectual abilities to compensate for weaknesses.	
Planning (Questions 15-19)	Very positive views of their skills here	Surprising and probably unrealistically positive view of skills of planning
Management Strategies (Questions 20-30)	Positive views but some evidence of multiple interpretations	Reveals variation in learner characteristics
Evaluation (Questions 31-37)	Teachers to do sensible things for the benefit of students and the reactions of students in their attempt to be successful.	Reveals normal pattern of student attempts to be successful

It is important to recognize that any survey is only as good as the questions set within it. Most of the questions fail to employ all the categories of responses adequately and, thus, discrimination will drop.

RESULTS & DISCUSSION

In the process of data analysis, each question was analyzed separately. Following this approach, it was found that some specific teacher skills (of a metacognitive nature) were correlated with student metacognitive awareness. Looking at tables, the first thing to note is that correlations above 0.10 occur in only 30 out of a possible 263 possible question combinations. This suggests very strongly that meta-cognitive aspects of teacher behaviour are not readily influencing student metacognition. In terms of the skills implicit in the 37 questions, there is a very low relationship between any teacher and student self-perceptions. All of this undermines any suggestion that students neatly reflect the behaviour patterns of their teachers. This is an important finding of this research.

In questions about procedural knowledge and declarative knowledge, the teachers consider themselves to be confident in their awareness and use of teaching strategies. The teachers were more confident about use of strategies that have worked in the past and they are keenly aware of their intellectual strengths and weaknesses, the students even more than the teachers. Again, it is unlikely that many will ever admit not being able to understand their intellectual strengths and weaknesses. As might be expected, almost every teacher expresses confidence in his ability to organize information and they see themselves as very good at remembering. Students are more divided; with some very confident in this skill while others (perhaps about 25%) show marked lack of confidence, this all indicated that students need guidance in this area.

The study also found that there is also clear evidence of the fact that some students tend to skim while others look at details, both useful ways of approaching complexity. What is obvious in some questions is that the students are reacting in totally understandable ways in response to an educational culture where the recall of the maximum amount of information brings the greatest rewards. Further, it is inevitable in that the limited capacity of working memory makes large steps or sequences of ideas more or less impossible to handle in terms of understanding. As the role of the teacher is to teach and make ideas accessible, they are more positive than the students whose role is more that of acceptance.

In the study seven questions were designed to focus on evaluation. However, what they do is to throw light on the desire for teachers to do sensible things for the benefit of students and the reactions of students in their attempt to be successful. On a much larger front, there are real questions to be addressed. To what extent is assessment measuring what is important? Is the assessment approach, based on written papers, the most effective way to measure performance? There is the real possibility (perhaps probability) that assessment is determining most of the emphases in an entire learning program.

This study has revealed the very complex nature of metacognition. The literature has often presented metacognition in overly precise terms and this study offers a welcome antidote to such spurious simplicity. It is difficult to argue that metacognition is a key element in generating greater student success. However, it is obvious that thinking about thinking is a useful skill in its own right and its development as an integral part of the whole process of learning may be very important. This study has offered some insights, guidelines and caveats for that future research.

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