25

Awareness of Classroom Learning Processes of Normal Elementary and Special High School Students with Mental Retardation in Mathematics and Japanese Language

Surender Kumar
Kyushu University, Hakozaki, Japan

International Seminar on
Researches in School Effectiveness at Primary Stage
July 14-16, 1999

NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING
New Delhi, India
July 1999

Introduction

At awareness of one's classroom learning processes one can better describe the learned matter and how the matter was learned and can recognize it along with the related matters (Dunlosky & Thiede, 1994, Maki & Serra, 1992). Such awareness of learning processes reflects a concept called 'metacognition' which contributes in the metacognitive knowledge (Josephs, Silvera, & Giesler, 1996). Thus, it is considered that by becoming aware of one's own learning process, an individual is better able to recognize, explain, and utilize the previous learned matter and processes in the other similar or somewhat different future life situations. The normal elementary students exhibited more awareness of learning processes at higher grade than at lower grade and in girls than in boys (Kumar & Harizuka, 1998a).

In students with mild and moderate mental retardation the awareness of learning processes was found comparably less in accordance with the normal controls of similar mental ages in different learning areas (Honeck, 1997). *For example*, Processing efficiencies, attention, novelty, transformation abilities, social processes, language, perception, problem solving, and social processes. Bilsky and Judd (1986) showed that these children had deficiencies in respect of memory, context, and sentence construction. They focus more on sequential information than the semantic one (Abbeduto & Nuccio, 1991); and comparable awareness of response strategy and processing strategy of learning processes was found in them (Kumar & Harizuka, 1999). Moreover, students with mental retardation have shown their 'semi awareness' of the learning processes (Kumar & Harizuka, 1998c). The normal elementary school students who cooperatively solved a mathematical task could improve more in the awareness of learning processes as well as the task-achievement than the students who followed general lecture-cum-demonstration instructional way to solve the similar task individually (Kumar & Harizuka, 1998b). Thus, it is possible that awareness of learning processes of different learning areas may vary with the subject matter and the instructional approach in normals and students with mental retardation.

Aim of the study

The purpose of this study was to examine: (a) the change in learning awareness and task-achievement in normals and students with mental retardation at three IQ and achievement levels with the cooperative instructional approach for metacognitive training and general classroom instructional approach in mathematics and Japanese language, and (b) to investigate the change in awareness of learning processes of semantic content, response strategy, processing strategy, summarization, and memory in three IQ groups of normals and students with mental retardation through cooperative instructional approach for metacognitive training and general classroom instructional approach in mathematics and Japanese language.

Method

Participants.- One hundred and fourteen students {Mentally retarded (mild & moderate) Group: n = 40 (M age = 16 yr., M education = 9.8 yr., M IQ = 57.1); Normal group: n = 74 (M age = 9.7 yr., M education = 4.8 yr.)} studying in special high school and elementary school were the participants in this study. The normals and students with mental retardation had no history of illness other than one that caused mental retardation in them. All subjects were communicable and could follow the instruction of the study. Three groups were stratified on the basis of IQ (Tanaka-binet Test) and achievement as measured by Raven's Progressive Matrices (see *table 1*).

Material.- 1. Learning Awareness Questionnaire (Kumar & Harizuka, 1998a) (in five learning areas: Semantic content, Response strategy, Processing strategy, Summarization, and Memory; on 17 items, Appendix-I). For example, If your friend asks you to tell him about yesterday's taught material in a subject, how do you tell the matter? (a) name of the book and number of pages in it (given one mark), (b) the interesting part in it (two marks), and (c) learned problem and the process how it was solved (three marks).

2. Raven's Progressive Matrices Test on A B C D sections. All the items were of matching type.

3. Tanaka-binet test for IQ,

4. Performance tasks comprising of matching type 25-items in each from two grade-congruent subject matters in mathematics, native (Japanese) language of graded difficulty. Classroom teachers (n = 5) rated the task on 5 point scale in both subjects. There was no significant difference (p > .05) in ratter's judgment tested by simple one-way ANOVA.

5. Development of cooperative instructional experience questionnaire on 9 items to be answered on Likert-type 5-points, *for example*, "Do you think that your group members helped you how to get a proper answer of the problem when you were in difficulty?"(very much, 5 points ~ very less helped 1 point).
6. Video tape recording (VTR) of the sessions when studying through cooperative approach or following general classroom instructional way to solve the problems individually.

Procedure.- Administration of LAQ as pretest, then mathematics or language problem solution in a 40 minutes period for 7 days either through cooperative instructional approach or general classroom instructional way to solve the problems individually most of the time. Next, mathematics or language performance task was administered and followed by LAQ as posttest. After that, cooperative- learning experience questionnaire and then Raven's Progressive Matrices for achievement categorization. All the students were divided into high (40-48), medium (33-39), and low (08-32) achievers on the basis of their achievement measured by Raven's Progressive Matrices. At last, Tanaka-binet records for IQ were collected from the school to divide students in normals (above 70), mild- (55-70), and moderates with mental retardation (40-54) on the basis of IQs (Disabilities Education Act of America, 1992). All the study sessions were recorded on video to evaluate the cognitive and metacognitive activities in their learning processes when solving the task.

Results

Learning awareness scores were analyzed with 3 (Group: low, medium, high IQ or Achievement) X 2 (Condition: pre, post LAQ) mixed factorial design within repeated measure in the condition factor. Students with mental retardation were less aware of their classroom learning awareness than matched-MA normal control students. Classroom learning awareness in students was less at lower IQ and at low achievement levels (see *table 1*). With the adjusted pre learning awareness, students of three IQ levels differ in their achievement task scores of mathematics and language and across cooperative and general instructional approaches of classroom learning. Significant interaction of Approaches x Groups showed that three groups differ in their achievement across cooperative and general classroom instructional approaches of learning (see *table 2, fig. 1*). In a separate analysis of

3 Groups (IQ) X 5 Condition (learning areas) ANOVA within repeated measure in the condition factor, three IQ groups were found to differ significantly at learning awareness of semantic content, response strategy, processing strategy, summarization, and memory {$F(2, 50) = 3.67, p < .05$)}. And interaction of condition X group was also significant. Condition effect was also significant, and indicated that lower IQ level students were comparably aware at response strategy, processing strategy, and summarization as the students of higher IQ levels.

The correlation between the scores of achievement, measured by Raven's Progressive Matrices, and learning awareness was found significant and week correlated for matched-MA normal controls ($N = 75$; Pearson $r = .237$; $p < .05$). Whereas the correlation between achievement and learning awareness was not significant for the students with mental retardation ($N = 40$; Pearson $r = .153$; $p > .05$).

Further, an analysis of variance in cooperative- learning awareness scores of matched-MA normal controls was done using a 2 (Subject: mathematics, language) X 5 (Condition: Semantic content, response strategy, processing strategy, summarization, memory) mixed factorial design with repeated measure in the condition factor. Condition effect was significant {$F(4, 312) = 22.12, p < .001$}. Subject effect {$F(1, 78) = .265, p = .61$} and interaction of Condition X Subject {$F(4, 312) = .487, p = .74$} was non significant. It revealed that normals acquire similar awareness of their learning processes in mathematics and language (*table* 3). *Tukey* was non significant among condition factor in mathematics and language for normal controls.

The analysis of variance in cooperative instructional learning awareness scores of the students with mental retardation was done using a 2 (Subject: mathematics, language) X 5 (Condition: Semantic content, response strategy, processing strategy, summarization, memory) mixed factorial design with repeated measure in the condition factor. Condition effect was significant {$F(4, 232) = 2.749, p < .05$}. Subject effect {$F(1, 58) = 1.682, p = .20$} was non significant but the interaction of Condition X Subject {$F(4, 232) = 3.367, p = .011$} was found significant. It shows that mentally retarded students acquire some what different strategic awareness of semantic content and memory processes to their learning of mathematics and language (*table* 3, *fig.* 2). The *Tukey* was non significant among condition factor of response strategy {$t(58) = 1.98; p = .053$}, processing strategy {$t(58) = .785; p$

= .43}, and summarization {$t(58) = .485; p = .63$} but significant in semantic content {$t(58) = 3.059; p = .003$} and memory {$t(58) = 2.301; p = .025$} factors in mathematics and language among subjects with mental retardation.

The analysis of variance in cooperative instructional mathematics learning awareness scores of normals and the students with mental retardation was done using a 2 (Group: matched-MA normal, mentally retarded) X 5 (Condition: Semantic content, response strategy, processing strategy, summarization, memory) mixed factorial design with repeated measure in the condition factor. Condition effect was significant {$F(4, 192) = 4.416, p < .01$}. Group effect {$F(1, 48) = 6.429, p = .015$} was significant but the interaction of Condition X Group {$F(4, 192) = .173, p = .961$} was found nonsignificant. The *Tukey* was non significant among condition factor of response strategy {$t(48) = 1.02; p = .312$}, processing strategy {$t(48) = 1.439; p = .157$}, and summarization {$t(48) = .262; p = .794$} but significant in semantic content {$t(48) = 2.438; p = .019$} and memory {$t(48) = 2.278; p = .027$} factors in cooperative instructional mathematics learning awareness scores among normals and students with mental retardation.

The analysis of variance in cooperative instructional language learning awareness scores of normals and the students with mental retardation was done using a 2 (Group: normal, mentally retarded) X 5 (Condition: Semantic content, response strategy, processing strategy, summarization, memory) mixed factorial design with repeated measure in the condition factor. Condition effect was significant ($F(4, 192) = 8.735, p < .001$}. Group effect {$F(1, 48) = 1.874, p = .177$} was nonsignificant but the interaction of Condition X Group {$F(4, 192) = 4.895, p = .001$} was found significant. It shows that normals and mentally retarded subjects have different strategic awareness of semantic content and memory processes in language learning (*table* 4; *fig*. 3). The *Tukey* was non significant among condition factor of response strategy {$t(48) = 1.21; p = .232$}, processing strategy {$t(48) = 1.245; p = .219$}, and summarization {$t(48) = 1.6; p = .116$} but significant in semantic content {$t(48) = 3.409; p = .001$} and memory {$t(48) = 2.834; p = .007$} factors in cooperative instructional language learning awareness scores among normals and students with mental retardation.

Interaction of matched-MA normal students among cooperative instructional learning activitie in mathematics based on classroom VTR showing cognitive and metacognitive aspects:

Studying in Groups:

1) Ask the partner about what the problem is (*cognitive*) ?, 2) Each other check the answers to the problems (*metacognitive*), 3) Everyone help each other in a group to understand and solve the problem by themselves (*metacognitive*), 4) Talk in different ways how to solve the problem (*metacognitive*), 5) Discuss on solved parts whether that is satisfactory to all groups members (*metacognitive*), 6) Every one has heartily involvement and work hard with smile at the face, 7) Discuss in pairs, in triples or with all groupmates about problems (*cognitive*), 8) Consult teacher if any non understandable problem to all (*cognitive*) , 9) Develop greater interest in problem solution, e.g., "It was too short time", "Let us work hard on next problem" (*metacognitive*), 10) Time increased to concentrate on activity and to performance (*cognitive*), 11) Teach the peers at asking for help at the points where one want detail explanation (*metacognitive*), 12) Listen carefully others' ideas (*cognitive*), 13) Finish the shared work on time and every one equally participate to write down the chart on group ideas for presentation infront of all (*metacognitive*), 14) Time to discuss on the problem increased with the involvement of discussion on the difficult matter and the ways of processes to solve it (*metacognitive*), and 15) Use teaching-aids effectively for task solution and realize its use for better understanding (*cognitive*).

Presentation:

1) Listen carefully and peacefully others ideas and take notes when one presents the points emerged in group with mutual discussion (*cognitive*), 2) Confidently present own and group ideas (*metacognitive*), 3) Consideration of ideas common in all groups presentation (*cognitive*), 4) Get support and feedback to their responses by others problem solving ideas (*metacognitive*), 5) At presentation and explanation of their ideas infront of all, they get better confidence and skills of presentation, explanation, and to defend their ideas (*metacognitive*), 6) Develop judgement to summarize a task within the time-limits of task (*metacognitive*), 7) By themselves, they can locate the mistake done in chart preparation, presentation or in explanation of group ideas (*metacognitive*), 8) Ask questions to clear their misunderstandings in presentation points and to enrich their knowledge about a task (*metacognitive*), 9) All group members could answer the questions made by others and

defended their conclusions (*metacognitive*), 10) Common problem arises in solution was asked to the teacher to provide detailed explanation (*cognitive*), 11) For reconfirmation of their ideas they also consulted books (*metacognitive*), 12) Had mutual discussion with teacher on unclear points (*metacognitive*), 13) Effective use of chalkboard for explanations and clarifications was made by students, 14) Realizes the mistakes done in solution or presentation, 15) Develop friendly environment and could answer the questions made by teacher with confidence.

Cooperative instructional learning experience responses of their learning processes reflecting its importance for comparatively better learning were as below:

1) "Studying in a group I feel interest, joy, and a zeal to help each other" (69%).
2) "Groupmates helped me much to find out the answer to the problem" (81%).
3) "Others in group recognized most my ideas in solving the problem" (87%).
4) "I recognized mostly the ideas of groupmates" (90%).
5) "I have a chance to present my ideas infront of whole/ group class" (75%).
6) "I think that I helped the groupmates most at his presentation" (69%).
7) "I can mostly understand the meaning of a problem when study in a group" (97%).
8) "I want most to study other subjects too with this approach" (91%).
9) "I think that teaching aids and material helped me much for better understanding" (94%).
10) "I got understand and get explained more about the problem, more exchange of ideas with peers, more chance of presentation infront of all, and more use of teaching aids and their development is helpful when studying with cooperative instructional approach".

Discussion and Findings

Cooperative instructional learning awareness results showed that normals acquire similar type of learning awareness at learning mathematics and language whereas, mentally retarded subjects reflected that they acquire incomparable awareness of learning in mathematics and language. Students with mental retardation showed less strategic awareness of semantic content and memory processes to their learning in mathematics and native language in comparison to normals but possesses comparable awareness of response strategy, processing strategy, and summarization. Thus, it further confirms our previous findings for comparable awareness of response strategy and processing strategy (Kumar & Harizuka, 1999) in students with mental retardation. Moreover, the equivalence of summarization awareness of learning processes in children with mental retardation showed the importance of cooperative instructional learning activities. It is because of the metacognitive training involvement which make the students more aware about their learning processes than in a general instructional classroom approach.

Significant correlation between achievement and learning awareness among normals is in the finding directions of Josephs, Silvera, & Giesler (1996). The weak correlation of such type among the students with mental retardation is a matter of consideration. Intellectual deficiencies and week reflection of their acquired knowledge in the form of learning awareness may be the most visible cause for it. Therefore, with the increase of awareness in learning it may be possible to contribute in task performance and to get more task related knowledge with better understanding of their learning processes through metacognitive training on a task.

The study showed that the students with mild intellectual deficiencies could better gain in their learning awareness of learning processes in mathematics through cooperative instructions; and the students with moderate intellectual deficiencies could gain in learning awareness in mathematics through general instructions of classroom learning. It is because the students with mild intellectual deficiencies can focus more on interactions involved in a group than the students with moderate intellectual deficiencies who weakly focus on such interaction and try hard to focus on teacher instructions only.

Language learning processes awareness were found more difficult than mathematics of the students with mental retardation. They gain more in awareness of the learning processes in mathematics at learning through cooperative instructions. Subject matter, its structure, level of difficulty and way of presentation play a role in the awareness and learning of the students with mental retardation. In mathematics, a fixed answer to a problem may provide better awareness of learning than in language as it need broader area thinking to response a problem and which create confusion in these students to learn the subject matter with broad thinking. It may be the possible reason for the difference in learning awareness of semantic content and memory processes of the students with mental retardation in comparison to the normal controls. If the subject matter is designed to create better awareness, it may be possible to gain in memory awareness of learning processes with the awareness of other learning areas.

Students with mental retardation and normals of lower IQ and low achievement levels were found to be less aware of their learning processes. These students benefited more at their classroom learning awareness and task-achievement in mathematics than native language following a cooperative instructional approach in five learning areas. Thus, interaction through cooperative instructional activities promotes learning awareness and task-performance best in average levels of IQ and achievements.

Implication of Findings for School Effectiveness

The study revealed that the students with mild intellectual disabilities can focus more on learning a task matter through cooperative instructions in mathematics than in language. It increases the awareness of response strategy, processing, and summarization. Also, the students with mental retardation were found to get awareness of semi awareness level on a standard task. An attempt to make them most aware of standard task through a general classroom instructions cause information overload. Therefore, these students can best learn with a task of moderate difficulty to cope up with their semi awareness level. Metacognitive training through cooperative instructional approach, involving group interaction, may provide them better awareness of semantic content and memory with response strategy, processing strategy, and summarization aspects of learning processes on a task and which may further contribute in task performance.

Over all, the study showed the importance of learning awareness for the elementary normals and the students with mental retardation to gain in task performance in mathematics better than a language through metacognitive training.

References

Abbeduto, L., & Nuccio, J. B. (1991). Relation between receptive language and cognitive maturity in persons with mental retardation. *American Journal of Mental Retardation*, **96**, 143-149.

Bilsky, L.H., & Judd, T. (1986). Sources of difficulty in the solution of verbal arithmetic problems by mentally retarded and nonretarded individuals. *American Journal of Mental Deficiency*, **90**, 395-402.

Dunlosky, J., & Thiede, K. W. (1994). Delaying students' metacognitive monitoring improves their accuracy in predicting their recognition performance. *Journal of Educational Psychology*, **86**, 290-302.

Honeck, R. P. (1997). An outsider looks at mental retardation: A moral, a model, and a metaprinciple. *International Review of Research in Mental Retardation*, **21**, 1-31.

Josephs, R. A., Silvera, D. H., & Giesler, R. B. (1996). The learning curve as a metacognitive tool. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, **22**, 510-524.

Kumar, S., & Harizuka, S. (1998a). Learning awareness: A study of elementary students. *Perceptual and Motor Skills*, **86**, 655-658.

Kumar, S., & Harizuka, S. (1998b). Cooperative learning-based approach and development of learning awareness and achievement in mathematics in elementary school. *Psychological Reports*, **82**, 587-591.

Kumar, S., & Harizuka, S. (1998c). Classroom learning awareness in students with mild mental retardation. *Educational Psychology Research Bulletin of Kyushu University*, **42**, 151-156.

Kumar, S., & Harizuka, S. (1999). Classroom learning awareness of semantic content, response strategy, processing strategy, summarization, and memory in students with mild intellectual disabilities. *Psychological Reports* (Accepted).

Maki, R. H., & Serra, M. (1992). The basis of test predictions for text material. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, **18**, 116-126.

Acknowledgment

I thankfully acknowledge the help rendered by the following persons in conducting all the experiments in this study: Mandal, Masuda, Matsubara, Miyashita, Iida, Yamamoto, Tsukamoto, Miyazaki (including all staff members of school), Furukawa, Jubashi, Koga, Matsunari, Kikuchi, Ishikura, the staff members of the Center for Clinical Psychology & Human Development, Kyushu University, and the students who participated in this study.

Time period of the study when conducted : March, 1998

Whether published : Not, but a part of the study was presented in the 24th Congress of Applied Psychology (of APA) at San Francisco, 9-14 August, 1998

Full name of Investigator(s) and address:

Dr. Surender Kumar and Prof. Susumu Harizuka
Faculty of Education, Graduate School of Human-Environment Studies,
Kyushu University, Hakozaki 6-19-1, Higashi-ku, Fukuoka-city 812-8581, Japan
Tel. +81-92-6423158; Fax: +81-92-6423588
E-mail: kumaredu@mbox.nc.kyushu-u.ac.jp
harizedu@mbox.nc.kyushu-u.ac.jp

Table 1. Pre-test learning awareness mean scores and SD in three Groups

Groups		Basis on IQ	Basis on Raven's test	Normal/ Challenged
A	*M*	38.05	38.3	38.0
	SD	2.93	3.63	3.4
B	*M*	36.38	35.9	-
	SD	2.89	3.5	-
C	*M*	34.68	35.2	35.7
	SD	3.98	3.61	3.5

Note: Categorization on the basis of IQ A(Normal) = 70~, B(Mild-) = 55~69, C(Moderates with mental retardation) = 40~54 (Disabilities Education Act of America, 1992); On the basis of Raven's Achievement test A (High achievers) = 40~48, B(Average achievers) = 33-39, C(Low achievers) = 08~32.

Table 2. Mean and SD of achievement task; pretest, posttest LAQ scores in three IQ groups

Groups		Cooperative		Competitive	
		Maths	Language	Maths	Language
	n	10	10	10	10
A	*M(SD)*	18.8 (2.35)	19.2 (3.26)	19.0 (4.71)	19.0 (2.50)
Pretest	*M(SD)*	38.2 (2.87)	35.9 (3.90)	35.9 (3.70)	38.3 (2.87)
Posttest	*M(SD)*	38.3 (2.82)	37.8 (3.22)	38.2 (3.17)	38.0 (3.05)
	n	7	14	14	7
B	*M(SD)*	18.00 (4.43)	22.77(1.14)	14.38 (6.73)	22.83(0.98)
Pretest	*M(SD)*	29.71 (2.87)	37.39(3.79)	34.71 (3.79)	29.71(2.87)
Posttest	*M(SD)*	37.83 (2.71)	36.23(3.59)	36.49 (2.79)	35.17(0.75)
	n	13	6	6	13
C	*M(SD)*	13.92 (4.01)	19.17(0.71)	11.83 (6.15)	16.16(4.09)
Pretest	*M(SD)*	34.15 (3.44)	37.50(4.93)	30.00 (4.93)	34.15(3.44)
Posttest	*M(SD)*	34.69 (4.07)	38.33(3.56)	35.17 (2.71)	32.77(4.42)

Note.- Maximum score for learning awareness = 51, Achievement task = 25

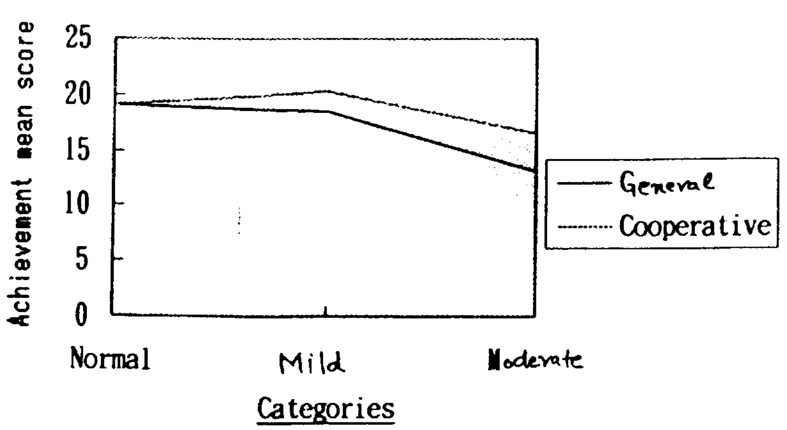

Fig. 1 Interaction of Approaches x Groups in three groups

Table 3. Mean and standard deviation of cooperative- learning awareness scores of matched-MA normals and students with mental retardation in mathematics and native language.

Groups		*Semantic content*		*Response strategy*		*Processing strategy*		*Summarization*		*Memory*	
	n	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
matched-MA normal controls											
Mathematics	40	2.27	.28	2.17	.32	2.21	.39	2.1	.47	2.56	.42
Language	40	2.27	.32	2.12	.34	2.11	.62	2.05	.52	2.61	.39
Students with mental retardation											
Mathematics	30	2.1	.19	2.09	.49	2.13	.61	1.97	.56	2.29	.54
Language	30	1.82	.46	2.31	.32	2.02	.53	2.03	.51	2.00	.43

Table 4. Mean and standard deviation of cooperative- mathematics and native language learning awareness scores of matched-MA normals and students with mental retardation.

Groups		*Semantic content*		*Response strategy*		*Processing strategy*		*Summarization*		*Memory*	
	n	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Mathematics											
Normals	25	2.26	.28	2.20	.32	2.16	.37	2.08	.43	2.51	.36
MRs	25	2.08	.26	2.10	.35	1.94	.67	2.12	.63	2.25	.42
Language											
Normals	25	2.29	.30	2.07	.32	2.08	.62	2.08	.47	2.61	.38
MRs	25	1.99	.31	2.20	.42	1.88	.51	2.30	.50	2.28	.45

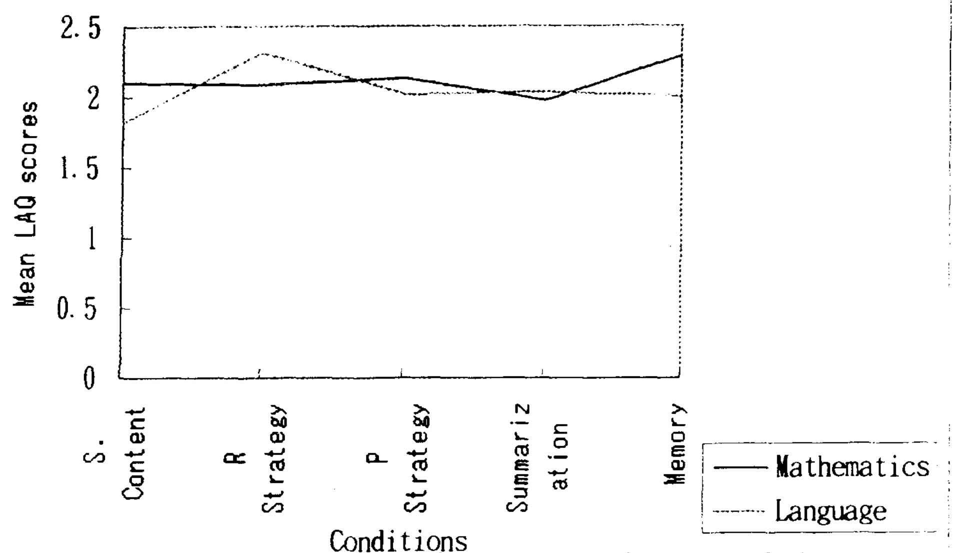

Fig. 2. Interaction of Condition X Subjects of the students with mental retardation

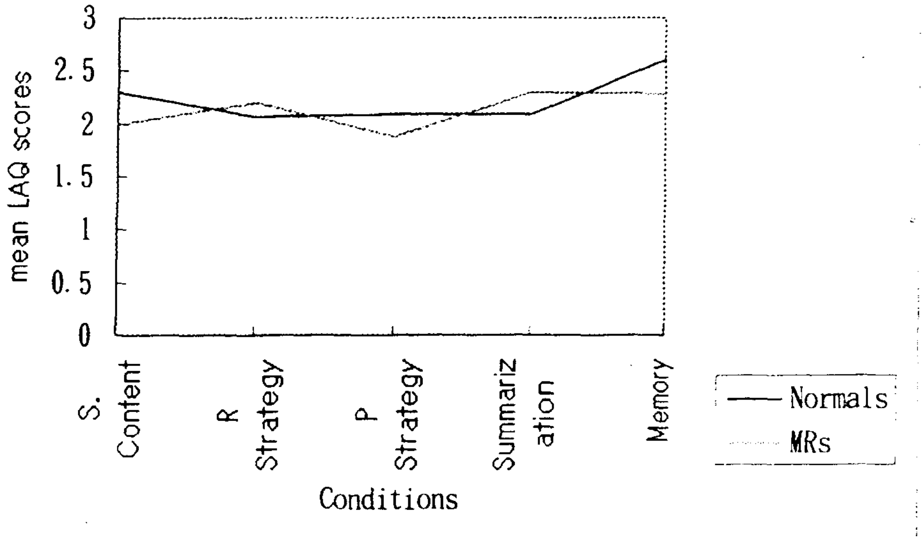

Fig. 3. Interaction of Condition X Group of learning awareness in cooperative- language

Appendix - I

Factor loading for each item of the Learning Awareness Questionnaire ($N = 60$) with the eigenvalue set at 1.50

Items in Learning Areas	Factor loading
Semantic content	
1. How do you know that which part of the subject matter is important	.50
2. If you are in a hurry and want to know some matter, which part of it you would like to read	.70
3. What do you do if you are reading a subject matter and did not understand the meaning of a part of it	.53
4. What do you do if you do not know the meaning of a sentence	.63
5. What do you do to remember the important information about a matter	.64
Response strategy	
6. How do you learn better a subject matter	.56
7. What do you do if you do not know how to solve a question	.55
8. How do you proceed to write some thing	.60
9. What helps you most to prepare for a test	.59
10. How do you learn and remember a matter for further use	.45
Processing strategy	
11. Before you start to read and write for learning the different things, what kind of plans do you make to help yourself	.64
12. How do you understand a matter better	.77
Summarization	
13. How do you learn better the introductory part of a subject matter taught in each subject	.67
14. What do you do to remember the conclusion of a subject matter	.77
Memory	
15. How do you find the main character in a subject matter	.59
16. If your friend asks you to tell him/her yesterday's taught matter, in a subject, how do you tell the matter	.59
17. Why do you go back and read a taught matter over again	.68

Note.- Three items were found redundant, therefore the final questionnaire was developed on the basis of 17 items. Split-half reliability (Pearson r = .79), the index of face validity (n = 5) (Pearson r) was .70.