TEACHERS' OPINIONS ON STUDENTS' HIGHER ORDER THINKING SKILLS

Ahmet Mahiroğlu
Gazi University, Turkey
amahir@gazi.edu.tr

ABSTRACT

The general aim of this research is to determine the teachers' opinions on students' higher order thinking skills according to primary school stages, and developed, underdeveloped, suburb and rural regions where the schools are located. The issues related to students' higher order thinking skills covered in this research are as follows: project based learning skills, problem solving skills, transferring of knowledge economy skills and critical thinking skills.

General survey model was used. One province from each climate region was selected as sample. The rubric was developed. Enough number of rubrics was sent to schools to be filled out by teachers and 645 rubrics were returned.

1st and 2nd stage students' higher order thinking skills are similar to each other in terms of regions and they are in the level of "average". Literacy competencies of the students are the highest whereas the foreign language competencies are the lowest.

Keywords: Higher Order Thinking Skills, Project Based Learning Skills, Problem Solving Skills, Transferring Knowledge-Economy Skills, Critical Thinking Skills

INTRODUCTION

In this research, higher order thinking skills of students will be determined according to teachers' opinions. This is necessary because to measure the effects of changed curricula, teaching methods and learning materials in time on higher order thinking skills, it will provide a baseline for evaluation. As the teachers can best observe the higher order thinking skills of their students, their opinions are considered valid.

There is a necessity to determine the level of higher order thinking skills of primary education students to measure the changes and efficacies of educational objectives, teaching methods and learning materials.

These higher order thinking skills are project based learning skills, problem solving skills, transferring knowledge-economy skills and critical thinking skills. There are many reasons that require these skills to be taught in schools. Each of these skills is required for various reasons and characteristics of these skills are given below.

Project competence is a broad term. A complete list of abilities that describe what it means to be competent in participating in projects will be very extensive and open for discussion (Hansen, 2004). Students must be able to collaborate, communicate, organize and deal with project management. Besides development of engagement, motivation and awareness of different people within the team are necessary (Hansen, 2004). Drucker, Cairncross, Canter and Leadbeater, Hargreaves (2000) has focused upon the transition to a knowledge economy, particularly with regard to its consequences for educational systems and schools (Peters, 2001). Hargreaves emphasises 'knowledge management' as playing a vital role in the move to become the 'learning society' (Peters, 2001). In the global knowledge economy it is going to be important to change the whole educational system to ensure a wide base of knowledge (Riley, 2003). The ability to think critically and to solve problems has been a concern of philosophers, educators, and psychologists for many centuries (Gelven & Stewart, 2001). Dewey (1933) was concerned with the nature and value of thinking. He considered thinking to be the process by which individuals find meaning in the world in which they live. The ability to think critically is a prerequisite for problem solving and as such is of significant value (Cited in Gelven & Stewart, 2001). Bloom stated that higher order thinking skills are built on the ability of students to identify concepts and analyze and integrate multiple concepts to solve problems. Therefore, problem solving requires higher order thinking, which Bloom stated can be taught (Cited in Gelven & Stewart, 2001). By internalizing the competencies, students will become more self-directed, self-disciplined, self-monitored thinkers (Paul & Elder, 2005). Even if humans were naturally inclined to think critically, it would still be difficult to master because it is what cognitive scientists call a "higher-order skill." That is, critical thinking is a complex activity built up out of other skills that are simpler and easier to acquire (van Gelder, 2004).

Project Based Learning Skills

Project based learning skills is one of the basic skill categories which students are expected to acquire. These skills are: (1) designing project, it means to realize an aim, a student designs a project with its all dimensions as individually or a group; (2) determining and reaching the resources, it means to how to decide what the needed materials are and how to obtain them (from a library etc.) to realize the designed project; (3) prepare product/service/report, it means that student, individually or as a group, prepares or writes a product, service or report; and (4) presenting the project, it means that student presents the project to class or other groups.

Students will overcome various obstacles during his or her life time using these skills. Project based learning skills provide

the students the opportunity to integrate the skills and knowledge acquired in various subjects and out of school. Project based learning skills are designing project, determining resources, obtaining required materials, producing goods and services, presenting, marketing and distributing the end products and evaluating the project according to the objectives, scope, duration and cost.

Problem Solving Skills

Problem solving skills group is another basic skill category which students are expected to acquire: (1) defining the problem, it means that a student should firstly realize, frame and define the problem to solve it; (2) presenting alternative solutions, problems may have more than one solution, it means a student can determine these solutions; (3) selecting the best solution, it means selecting the most adequate and economical solution for the current problem; (4) applying the selected solution to problem, it means trying the selected solution on problem; and (5) Judging the solution, after applying the solution, problem may be solved totally or partly, it means a student should be aware of this and evaluate the result of solution.

Transferring Knowledge-Economy Skills

Being successful in knowledge economy requires having a number of new knowledge and competencies. Transferring knowledge-economy skills are (1) literacy competencies, it means that a student can use his literacy competencies in other courses and daily life; (2) foreign language competencies, it means that a student can use his or her foreign language competencies, learnt in foreign language courses, in other courses and daily life; (3) mathematics skills, it means that a student can use his mathematics competencies, learnt in mathematics courses, in other courses and daily life; (4) science and technology skills, it means that a student can use science and technology competencies, learnt in science and technology courses, in other courses and daily life; (5) information and communication technology skills, it means that a student can use information and communication technologies competencies in other courses and daily life; (6) having initiative, it means that a student can have responsibility on any situation he comes across in his school and daily life; and (7) working collaboratively in heterogeneous groups, it means that without showing any discrimination, a student can work in harmony and collaboratively with others who may have different sex, race and religion.

Students must use these skills efficiently, acting on their own and reflective, participating socially heterogenic groups and work collaboratively. For this reason, determining how much students developed these skills is an important dimension in this research.

Critical Thinking Skills

Drucker (1993) emphasizes that schools are responsible for making the students acquire universal literacy meaning skills of critical thinking and creative thinking. These are called as higher order thinking skills. Ministry of National Education of Turkey, also, wants to make students acquire these thinking skills starting from the primary education years in the renewing curriculum. Critical thinking skills are (1) defining and summarizing a subject or a problem, it means that a student can determine the items of a subject and the relations among these items and if needed can summarize the subject; (2) determining and evaluating the qualities of evidences and data supporting a subject or related to a problem,

it means that a student can determine the power of the evidences and data supporting a subject or related to a problem and make an evaluation on them; (3) determining and taking into consideration the effects of a subject or a problem on different fields (social, cultural, economical etc.), it means that a student can determine the effects of a subject or a problem on different fields (social, cultural, economical etc.) and take this effect into consideration; (4) understanding of an opinion clearly and interpreting biased opinions, when comes across a new opinion, a student can understand the real intent of the opinion owner and his objectivity level; and (5) determining and evaluating judgements, practices and probable developments, it means that a student can determine judgements, practices and probable developments and evaluate them.

Aims of the Research

The general aim of this research is to determine the teachers' opinions on students' higher order thinking skills according to primary school stages, and developed, underdeveloped, suburb and rural regions where the schools are located. Primary school is eight years, the first five years are called 1st stage and the last three years are called 2nd stage. The issues related to students' higher order thinking skills covered in this research are as follows: project based learning skills, problem solving skills, transferring of knowledge economy skills and critical thinking skills.

METHODOLOGY

General survey model was used in this research. One province from each region was selected as sample, since there are seven

climate regions in Turkey. Four of them are developed provinces and the rest of them are underdeveloped provinces according to Turkish Statistics Institution.

The numbers of the schools included in the research are given in Table 1 below:

Table 1: Distribution of Schools by Provinces

Development Level	Provinces	Suburb	Rural	Total
Developed	İstanbul	35	7	42
Developed	Ankara	12	6	18
Developed	İzmir	11	6	17
Developed	Mersin	7	8	15
Underdeveloped	Erzurum	5	7	12
Underdeveloped	Şanlıurfa	7	11	18
Underdeveloped	Samsun	5	7	12
		82	52	134

The rubric used in the research was developed considering each skill groups' steps and 5-point Likert type scale. Enough number of rubrics was sent to schools to be filled out by teachers and 645 rubrics were returned. Although Likert type scale is an ordinal scale, in this study it is accepted as equal interval scale and at the analyses of data mean is calculated and used.

FINDINGS and INTERPRETATION of DATA

The means of teachers' opinions on primary education 1st and 2nd stage students' higher order thinking skills is given in Table 2.

According to teachers, as seen in Table 2, with relation to project based learning skills, 1st stage students have the highest mean in "presenting the project" (3.03), and the lowest in "designing project" (2.87), "determining and reaching to resources" (2.87). 2nd stage students have the highest mean in "presenting the project" (2.99) and the lowest in "designing project" (2.86). According to teachers, 1st stage students' project based learning skills (2.92) and 2nd stage students' project based learning skills (2.93) are evaluated as "average".

According to teachers, as seen in Table 2, with relation to problem solving skills, 1st stage students have the highest mean in "defining the problem" (2.99), and the lowest in "selecting the best solution" (2.94), "judging the solution" (2.94). 2nd stage students have the highest mean in "defining the problem" (2.94) and the lowest in "presenting alternative solutions" (2.83). According to teachers, 1st stage students' problem solving skills (2.96) and 2nd stage students' problem solving skills (2.90) are evaluated as "average".

According to teachers, as seen in Table 2, with relation to transferring knowledge-economy skills, 1st stage students have the highest mean in "literacy competencies" (3.56), and the lowest in "foreign language competencies" (2.66). 2nd stage students have the highest mean in "literacy competencies" (3.42) and the lowest in "foreign language competencies" (2.58). According to teachers, 1st stage students' transferring knowledge-economy skills (3.16) and 2nd stage students' transferring knowledge-economy skills (2.98) are evaluated as "average".

According to teachers, as seen in Table 2, with relation to critical thinking skills, 1st stage students have the highest mean in "defining and summarizing a subject or a problem" (3.19), and the lowest in "determining and taking into consideration the effects of a subject or a problem on different fields (social, cultural, economical etc.)" (2.93). 2nd stage students have the highest mean in "defining and summarizing a subject or a problem" (3.09) and the lowest in "determining and taking into consideration the effects of a subject or a problem on different fields (social, cultural, economical etc.)" (2.86). According to teachers, 1st stage students' critical thinking skills (3.00) and 2nd stage students' critical thinking skills (2.93) are evaluated as "average".

According to teachers, as seen in Table 2, the general averages of 1st and 2nd stage students' higher order thinking skills are (3.03) and (2.94) respectively. In other words, higher order thinking skills of students are regarded as "average".

Table 2: Teachers' opinions on primary education 1st and 2nd stage students' higher order thinking skills

	I. Stage	II. Stage
Project Based Learning Skills It means students competencies on completing a project from starting to finish using the knowledge and skills they obtained from the classes.	**Mean**	**Mean**
1. Designing Project It means to realize an aim; a student designs a project with its all dimensions as individually or a group.	2,87	2,86
2. Determining and reaching to resources It means how to decide what are the needed materials and how to obtain them (from a library etc.) to realize the designed project.	2,87	2,98
3. Prepare product / service / report It means that student, individually or as a group, prepares or writes a product, service or report.	2,91	2,88
4. Presenting the project It means that student presents the project to class or other groups.	3,03	2,99
Average	**2,92**	**2,93**
Problem Solving Skills It means the competencies that students use to overcome a problem.	**Mean**	**Mean**
5. Defining the Problem It means that a student should firstly realize, frame and define the problem to solve it.	2,99	2,94
6. Presenting Alternative Solutions Problems may have more than one solution. It means a student can determine these solutions.	2,95	2,83
7. Selecting the best solution It means selecting the most adequate and economical solution for the current problem.	2,94	2,91
8. Applying the selected solution to problem It means trying the selected solution on problem.	2,97	2,91
9. Judging the solution After applying the solution, problem may be solved totally or partly. It means a student should be aware of this and evaluate the result of solution.	2,94	2,89
Average	**2,96**	**2,90**
Transferring Knowledge-Economy Skills A student's ability of using his ability and knowledge obtained in a course on different courses or daily life.	**Mean**	**Mean**
10. Literacy Competencies It means that a student can use his literacy competencies in other courses and daily life.	3,56	3,42
11. Foreign language Competencies It means that a student can use his foreign language competencies, learnt in foreign language course, in other courses and daily life.	2,66	2,58
12. Mathematics Skills It means that a student can use his mathematics competencies, learnt in mathematics course, in other courses and daily life.	3,14	2,76
13. Science and Technology Skills It means that a student can use science		

and technology competencies, learnt in science and technology course, in other courses and daily life.	3,14	2,86
14. Information and Communication Technology Skills It means that a student can use information and communication technologies competencies in other courses and daily life.	3,09	2,97
15. Having initiative It means that a student can have responsibility on any situation he comes across in his school and daily life.	3,14	3,05
16. Working collaboratively in heterogeneous groups It means that without showing any discrimination, a student can work in harmony and collaboratively with others who may have different sex, race and religious.	3,41	3,25
Average	**3,16**	**2,98**
Critical Thinking Skills Instead of accepting a new information as it is, a student should do query and analysis on it, reach alternative and similar information, and evaluate result from multiple dimensions.	**Mean**	**Mean**
17. Defining and summarizing a subject or a problem It means that a student can determine the items of a subject and the relations among these items and if needed can summarize the subject.	3,19	3,09
18. Determining and evaluating the qualities of evidences and data supporting a subject or related to a problem It means that a student can determine the power of the evidences and data supporting a subject or related to a problem and make an evaluation on them.	2,97	2,93
19. Determining and taking into consideration the effects of a subject or a problem on different fields (social, cultural, economical etc.) It means that a student can determine the effects of a subject or a problem on different fields (social, cultural, economical etc.) and take this effect into consideration.	2,93	2,86
20. Understanding of an opinion clearly and interpreting biased opinions When come a cross a new opinion, a student can understand the real intent of the opinion owner and his objectivity level.	2,97	2,92
21. Determining and evaluation judgments, practices and probable developments It means that a student can determine judgments, practices and probable developments and evaluate them.	2,94	2,87
Average	**3,00**	**2,93**
General Average	**3,03**	**2,94**

The means of teachers' opinions on primary education 1st stage students' higher order thinking skills according to developed,

underdeveloped, suburb and rural areas, where schools are located, are given in Table 3.

Table 3: Teachers' opinions on primary education 1st stage students' higher order thinking skills according to developed, underdeveloped, suburb and rural regions

	D*	U*	S*	R*
Project Based Learning Skills	**Mean**	**Mean**	**Mean**	**Mean**
1. **	2,87	2,89	2,87	2,89
2. **	2,90	2,80	2,94	2,91
3. **	2,89	2,94	2,89	2,93
4. **	3,02	3,07	3,03	3,04
Average	**2,34**	**2,34**	**2,35**	**2,35**
Problem Solving Skills	**Mean**	**Mean**	**Mean**	**Mean**
5. **	2,99	2,98	3,01	3,00
6. **	2,92	3,04	2,94	2,91
7. **	2,93	2,96	2,94	2,92
8. **	2,96	3,01	3,00	2,94
9. **	2,92	3,01	2,96	2,91
Average	**2,94**	**3,00**	**2,97**	**2,94**
Transferring Knowledge-Economy Skills	**Mean**	**Mean**	**Mean**	**Mean**
10. **	3,58	3,51	3,63	3,62
11. **	2,65	2,67	2,68	2,66
12. **	3,12	3,19	3,16	3,13
13. **	3,16	3,09	3,20	3,15
14. **	3,10	3,06	3,17	3,08
15. **	3,14	3,14	3,18	3,15
16. **	3,38	3,53	3,45	3,35
Average	**3,16**	**3,17**	**3,21**	**3,16**
Critical Thinking Skills	**Mean**	**Mean**	**Mean**	**Mean**
17. **	3,17	3,25	3,19	3,17
18. **	2,96	2,99	2,98	2,96
19. **	2,92	2,94	2,93	2,93
20. **	2,94	3,07	2,95	2,95
21. **	2,94	2,96	2,97	2,93
Average	**2,99**	**3,04**	**3,00**	**2,99**
General Average	**3,02**	**3,05**	**3,05**	**3,02**

* D: Developed; U: Underdeveloped; S: Suburb; R: Rural

** These steps and their definitions are the same as in Table 2

According to teachers, as seen in Table 3, in developed region, with relation to project based learning skills, 1st stage students have the highest mean in "presenting the project" (3.02), and the lowest in "designing project" (2.87). In underdeveloped region, students have the highest mean in "presenting the project" (3.07) and the lowest in "determining and reaching to resources" (2.80). In suburb region, students have the highest mean in "presenting the project" (3.03) and the lowest in "designing project" (2.87). In rural region, students have the highest mean in "presenting the project" (3.04) and the lowest in "designing project" (2.89). According to teachers, 1st stage students' project based learning skills averages are (2.34), (2.34), (2.35) and (2.35) with regard to developed, underdeveloped, suburb and rural regions respectively. In other words, project based learning skills of students are evaluated as "average".

According to teachers, as seen in Table 3, in developed region, with relation to problem solving skills, 1st stage students have the highest mean in "defining the problem" (2.99), and the lowest in "presenting alternative solutions" (2.92) and "judging the solution" (2.92). In underdeveloped region, students have the highest mean in "presenting alternative solutions" (3.04) and the lowest in "selecting the best solution" (2.96). In suburb region, students have the highest mean in "defining the

problem" (3.01) and the lowest in "presenting alternative solutions" (2.94) and "selecting the best solution" (2.94). In rural region, students have the highest mean in "defining the problem" (3.00) and the lowest in "presenting alternative solutions" (2.91). According to teachers, 1st stage students' problem solving skills averages are (2.94), (3.00), (2.97) and (2.94) with regard to developed, underdeveloped, suburb and rural regions respectively. In other words, problem solving skills of students are evaluated as "average".

According to teachers, as seen in Table 3, in developed region, with relation to transferring knowledge-economy skills, 1st stage students have the highest mean in "literacy competencies" (3.58), and the lowest in "foreign language competencies" (2.65). In underdeveloped region, students have the highest mean in "working collaboratively in heterogeneous groups" (3.53) and the lowest in "foreign language competencies" (2.67). In suburb region, students have the highest mean in "literacy competencies" (3.63) and the lowest in "foreign language competencies" (2.68). In rural region, students have the highest mean in "literacy competencies" (3.62) and the lowest in "foreign language competencies" (2.66). According to teachers, 1st stage students' transferring knowledge-economy skills averages are (3.16), (3.17), (3.21) and (3.16) with regard to developed, underdeveloped, suburb and rural regions respectively. In other words, transferring knowledge-economy skills of students are evaluated as "upper average".

According to teachers, as seen in Table 3, in developed region, with relation to critical thinking skills, 1st stage students have the highest mean in "defining and summarizing a subject or a problem" (3.17), and the lowest in "determining and taking into consideration the effects of a subject or a problem on different fields (social, cultural, economical etc.)" (2.92). In underdeveloped region, students have the highest mean in "defining and summarizing a subject or a problem" (3.25) and the lowest in "determining and taking into consideration the effects of a subject or a problem on different fields (social, cultural, economical etc.)" (2.94). In suburb region, students have the highest mean in "defining and summarizing a subject or a problem" (3.19) and the lowest in "determining and taking into consideration the effects of a subject or a problem on different fields (social, cultural, economical etc.)" (2.93). In rural region, students have the highest mean in "defining and summarizing a subject or a problem" (3.17) and the lowest in "determining and taking into consideration the effects of a subject or a problem on different fields (social, cultural, economical etc.)" (2.93) and "determining and evaluation judgments, practices and probable developments" (2.93). According to teachers, 1st stage students' critical thinking skills averages are (2.99), (3.04), (3.00) and (2.99) with regard to developed, underdeveloped, suburb and rural regions respectively. In other words, critical thinking skills of students are evaluated as "average".

According to teachers, as seen in Table 3, the general averages of 1st stage students' higher order thinking skills are (3.02), (3.05), (3.05) and (3.02) with regard to developed, underdeveloped, suburb and rural regions respectively. In other words, higher order thinking skills of students are regarded as "average".

The means of teachers' opinions on primary education 2nd stage students' higher order thinking skills according to developed, underdeveloped, suburb and rural areas, where schools are located, are given in Table 4.

Table 4: Teachers' opinions on primary education 2nd stage students' higher order thinking skills according to developed, underdeveloped, suburb and rural regions

	D	**U**	**S**	**R**
Project Based Learning Skills	**Mean**	**Mean**	**Mean**	**Mean**
1.	2,85	2,92	2,86	2,87
2.	2,98	2,99	2,93	2,95
3.	2,86	2,97	2,93	2,95
4.	2,99	2,99	2,96	2,95
Average	**2,92**	**2,97**	**2,92**	**2,93**
Problem Solving Skills	**Mean**	**Mean**	**Mean**	**Mean**
5.	2,93	2,96	2,89	2,95
6.	2,79	3,01	2,93	3,00

7.	2,88	3,03	2,95	2,98
8.	2,90	2,95	2,80	2,88
9.	2,88	2,93	2,82	2,92
Average	**2,88**	**2,98**	**2,88**	**2,95**
Transferring Knowledge-Economy Skills	**Mean**	**Mean**	**Mean**	**Mean**
10.	3,39	3,54	3,55	3,50
11.	2,56	2,67	2,73	2,73
12.	2,75	2,81	2,77	2,76
13.	2,86	2,86	2,84	2,83
14.	2,98	2,95	2,98	2,94
15.	3,00	3,24	3,20	3,24
16.	3,20	3,41	3,30	3,38
Average	**2,96**	**3,07**	**3,05**	**3,05**
Critical Thinking Skills	**Mean**	**Mean**	**Mean**	**Mean**
17.	3,08	3,13	3,10	3,06
18.	2,92	2,95	2,84	2,92
19.	2,83	2,95	2,93	2,90
20.	2,89	3,05	2,95	3,00
21.	2,84	2,97	2,83	2,91
Average	**2,91**	**3,01**	**2,93**	**2,96**
General Average	**2,92**	**3,01**	**2,96**	**2,98**

* D: Developed; U: Underdeveloped; S: Suburb; R: Rural

** These steps and their definitions are the same as in Table 2

According to teachers, as seen in Table 4, in developed region, with relation to project based learning skills, 2nd stage students have the highest mean in “presenting the project” (2.99), and the lowest in “designing project” (2.85). In underdeveloped region, students have the highest mean in “determining and reaching to resources” (2.99), “presenting the project” (2.99) and the lowest in “designing project” (2.92). In suburb region, students have the highest mean in “presenting the project” (2.96) and the lowest in “designing project” (2.86). In rural region, students have the highest mean in “determining and reaching to resources” (2.95), “prepare product/service/report” (2.95), “presenting the project” (2.95) and the lowest in “designing project” (2.87). According to teachers, 2nd stage students’ project based learning skills averages are (2.92), (2.97), (2.92) and (2.93) with regard to developed, underdeveloped, suburb and rural regions respectively. In other words, project based learning skills of students are evaluated as “average”.

According to teachers, as seen in Table 4, in developed region, with relation to problem solving skills, 2nd stage students have the highest mean in “defining the problem” (2.93), and the lowest in “presenting alternative solutions” (2.79). In underdeveloped region, students have the highest mean in “selecting the best solution” (3.03) and the lowest in “judging the solution” (2.93). In suburb region, students have the highest mean in “selecting the best solution” (2.95) and the lowest in “applying the selected solution to problem” (2.80). In rural region, students have the highest mean in “presenting alternative solutions” (3.00) and the lowest in “applying the selected solution to problem” (2.88). According to teachers, 2nd stage students’ problem solving skills averages are (2.88), (2.98), (2.88) and (2.95) with regard to developed, underdeveloped, suburb and rural regions respectively. In other words, problem solving skills of students are evaluated as “average”.

According to teachers, as seen in Table 4, in developed region, with relation to transferring knowledge-economy skills, 2nd stage students have the highest mean in “literacy competencies” (3.39), and the lowest in “foreign language competencies” (2.56). In underdeveloped region, students have the highest mean in “literacy competencies” (3.54) and the lowest in “foreign language competencies” (2.67). In suburb region, students have the highest mean in “literacy competencies” (3.55) and the lowest in “foreign language competencies” (2.73). In rural region, students have the highest mean in “literacy competencies” (3.50) and the lowest in “foreign language competencies” (2.73). According to teachers, 2nd stage students’ transferring knowledge-economy skills averages are (2.96), (3.07), (3.05) and (3.05) with regard to developed, underdeveloped, suburb and rural regions respectively. In other words, transferring knowledge-economy skills of students are evaluated as “average”.

According to teachers, as seen in Table 4, in developed region, with relation to critical thinking skills, 2nd stage students have the highest mean in “defining and summarizing a subject or a problem” (3.08), and the lowest in “determining and taking into

consideration the effects of a subject or a problem on different fields (social, cultural, economical etc.)" (2.83). In underdeveloped region, students have the highest mean in "defining and summarizing a subject or a problem" (3.13) and the lowest in "determining and evaluating the qualities of evidences and data supporting a subject or related to a problem" (2.95) and "determining and taking into consideration the effects of a subject or a problem on different fields (social, cultural, economical etc.)" (2.95). In suburb region, students have the highest mean in "defining and summarizing a subject or a problem" (3.10) and the lowest in "determining and evaluation judgments, practices and probable developments" (2.83). In rural region, students have the highest mean in "defining and summarizing a subject or a problem" (3.06) and the lowest in "determining and taking into consideration the effects of a subject or a problem on different fields (social, cultural, economical etc.)" (2.90). According to teachers, 2nd stage students' critical thinking skills averages are (2.91), (3.01), (2.93) and (2.96) with regard to developed, underdeveloped, suburb and rural regions respectively. In other words, critical thinking skills of students are evaluated as "average".

According to teachers, as seen in Table 4, the general averages of 2nd stage students' higher order thinking skills are (2.92), (3.01), (2.96) and (2.98) with regard to developed, underdeveloped, suburb and rural regions respectively. In other words, higher order thinking skills of students are regarded as "average".

CONCLUSIONS and RECOMMENDATIONS

1st and 2nd stage students' higher order thinking skills are similar to each other in terms of regions and they are in the level of "average". Literacy competencies of the students are the highest whereas the foreign language competencies are the lowest.

The project based learning skills of primary school students are average and both first and second stages are almost the same. Means in underdeveloped regions are found slightly higher than the means of other regions.

The problem solving skills of primary school students are almost average and all steps display similarities. From the point of regions, developed and suburb, and also underdeveloped and rural are nearly same and the latter two is higher than the former two.

Transferring knowledge economy skills of students are in the level of "average" and 1st stage students' means are slightly higher than 2nd stage students' means. Literacy competencies in both stages are between "average" and "good" border. However, foreign language competencies are between "average" and "poor" border. Students' transferring knowledge economy skills according to regions are the lowest in developed region, second in the suburb, third in the rural and in the underdeveloped region.

Critical thinking skills of students are at the average level. 1st stage students' critical thinking skills are slightly higher than 2nd stage students' critical thinking skills. According to the regions, students' critical thinking skills are the same in developed and suburb, and underdeveloped and rural, the former two is slightly lower than the latter two.

Higher order thinking skills of primary school students are almost the same between the stages and regions and at "average" level.

This result may be used as a baseline for future studies to measure the impact of new curricula, teaching methods, materials and applications. This result also shows that there is a need to improve higher order thinking skills of primary school students. So, special attention should be given to improve higher order thinking skills of students.

REFERENCES

CTR. (n.d.). Critical Thinking Rubric. Retrieved February 22, 2007, from

http://academic.pgcc.edu/~wpeirce/MCCCTR/Designingrubricsassessingthinking.html

Drucker, F. (1993). *Post-capitalist society.* Collins.

Gelven, D. R. & Stewart, B. R. (2001). Developing critical thinking skills of tech prep students using applied communications. *The Journal of Technology Studies.*

Hansen, S. (2004). The supervisor in the project-organized group work should participate in developing the students' project competencies. *European Journal of Engineering Education*, *29*, 451-459.

Paul, R. & Elder, L. (2005). *Guide for educators to critical thinking competency standards: Standards, principles, performance indicators, and outcomes with a critical thinking master rubric.* Foundation for Critical Thinking. Retrieved February 14, 2007, from http://www.criticalthinking.org/TGS_files/SAM-CT_competencies_2005.pdf

Peters, M. (2001). National education policy constructions of the 'knowledge economy': towards a critique. *Journal of*

Educational Enquiry, *2*.

Riley, T. B. (2003). An overview of the knowledge economy. *eGov monitor Weekly*. Retrieved February 14, 2007, from http://www.egovmonitor.com/features/riley07.html