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Assessment of the high school students' critical thinking skills

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Abstract

This study is conducted to determine the high school students' critical thinking skills. The study is descriptive and done with the survey model. In order to measure the critical thinking skills of the students a 5 point Likert-type questionnaire composed of 21 questions is developed by the researcher. The sample of the study is 722 high school students from four different school types in the education year 2010-2011 from Hakkari. The Cronbach Alpha coefficient of the questionnaire is determined to be 0.87. Based on the F-test, t-test and the mean value the significance level is 0.05 and the results are evaluated with respect to this value. The results of the survey reveal that the critical thinking skills of the students vary between the school types namely, Anatolian High School, Science High School and Vocational High School.
Keywords: Critical Thinking, Thinking Skills, High School;

1. Introduction

The importance given to individual education is increasing day by day all over the world. Especially educators understand the importance of the education given to young individuals better day by day. The more the world becomes modern , the more complicated it becomes and together with social and psychological disorders, it becomes more complicated. In a world which becomes modern and complicated, educators are keeping on searching the best education model with all possible dispatch, in order for individuals to be educated ideally and to be given the most accurate education. Today, the educators want the individuals approach the problems and matters, they face, in modernizing world commonsensically and scientifically and then decide and minimize the mistakes they make. Educators are trying to make the individuals comprehend critical thinking at all points and to make the individuals decide accurately by thinking critically in the event of the matters in order for the students not to make mistake and to approach the matters critically,rationally and scientifically.

2. Critical Thinking

Critical thinking means that the individual features his/her such intellectual thinking skills as reasoning, analyzing, problem solving, reading comprehension, scientific thinking, creative thinking, judgement and deciding accurately. Today critical thinking is called reasoning and reasoning based thinking is called commonsensical thinking. Critical thinking comprises of such processes as featuring intelligence about a matter, deciding and judging accurately. Some scientists define the critical thinking as making out in terms of scientific observation (Paul 1991, 125), being awaring of our own thinking process, activating and organizing the matters by taking understanding

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ourselves and the matters around us as a goal, by implementing the points we learn and taking into account others' thinking skill. (Cüceloğlu. 1994, 216). Demirel (1999) bases the critical thinking on integration, consistence, applicability, adequacy and communicating, which consists of five basic dimensions. (Demirel, 1999) As understood from definitions and explanations, critical thinking is a theory consisting of required thinking and behaviours in such subjects as reasoning, taking logical decisions and being inspired by mentioned subjects.

2.1. Characteristic of Critical Thinking

When critical thinking is mentioned, the first think coming to mind is Dewey, scientist. In accordance with Gündoğdu (2009), in his definitions, Dewey explains the critical thinking in six steps. Firstly Dewey defines the critical thinking as actively thinking process and emphasizes that we should use it against passive thoughts received from others. Secondly, he defines it as evaluating carefully and he introduces it as an opposition to random thinking which decides instantly without thinking twice. (Fischer, 2001, 2) Thirdly, critical thinking is a way of thinking awaring of evidences and results. In accordance with Dewey, knowing the reasons and evidences of the opinions we have, and knowing that under what circumstances they are thought, provides that we decide logically and consciencely and we make a choice among the alternatives and we know its effects. (Lipman, 2003, 207; Fischer 2001, 3) And fourthly, in Dewey' s definition from reference to both continual evaluation and proofs and results, it is understood that critical thinking is a way of thinking which makes the thinking process, itself, viewpoints, always open to evaluation. Fifthly, critical thinking is a way of thinking which is reflexive and open to changings and self-betterment. (Lipman, 2003, 26; Gündoğdu, 2006, 61) Sixthly, Dewey describes the critical thinking as controlled thinking. (Gündoğdu, 2009, 61-62) Considering Dewey' s explanations, the individual thinking critically should make his/her decisions by putting forward cause and effect relation scientifically and commonsensically and by thinking in the framework of science.

At the same time critical thinking depends on individual' s capacity. In accordance with Ennis (1985), critical thinking consists of some skills and tendencies. These are;

- Searching open expression of thesis or problem.
- Searching causes.
- Trying to be informed accurately.
- Using reliable sources and signifying used sources.
- Taking into account the situation throughly.
- Trying to abide by basic point.
- Keeping the main or basic problem in mind.
- Searching choices.
- Being broad- minded.
    - Taking others' opinions into account.
    - While making decision, applying rejectable reference points, without affected by acceptance of reference points.
    - In the event that proofs and causes are not sufficient, adjourning the decision.
- In the event that proofs and causes are not sufficient, behaving aimed at making decision.
- Searching accuracy on a scale allowed by the matter.
- Discussing the parts of the complicated sum in an orderly manner.
- Being sensitive to others' senses, information and cultural level. (Enniz, 1985, 54; Akt. Seferoğlu and Akbıyık, 2006, 195-196). Ennis specifies actions to be taken by individuals explicitly. In accordance with Ennis, an individual should approach the matters commonsensically, should try to comprehend the matter and treat imparcially and and above all he/she should criticize himself/herself when required.

3. Method

This study was carried out by applying general screening model, one of the descriptive screening models. In order to understand the causes of the study results, 18 students were choosen among the students participating in the

survey circumstantially and their opinions regarding their answers to the survey. Moreover, during the analysis of datas, the survey has a quantitative properties as statistical methods were used.

3.1 The Aim of the Study

The aim of this study is to try to specify the attitudes and thoughts of the students studying in high school (classes of 9, 10.) regarding critical thinking skill in accordance with sex and class level.

3.2. Study Group of the Study

The students studying in all secondary schools of centre of Hakkari constitutes the nature of this study. 722 secondary school students (classes of 9. 10) studying in the secondary schools of Science High School of Hakkari (145 students), Trade Vocational School of Hakkari (225 students), Anatolian Teacher High School of Hakkari (185 students) constitutes the sampling of this study.

3.3. Study Model

This study was carried out in order to specify the critical thinking skills of the students studying in secondary schools (classes of 9, 10) depending on their sex and class levels. In parallel with this purpose, a new survey was prepared by examining the surveys having been applied previosly regarding the critical thinking, and after the opinions of three academic members regarding the survey, had been taken, required corrections were made and the survey took its final form.

The survey questions in this study, were applied to 722 students studying in secondary schools of center of Hakkari, and their attitudes towards critical thinking skill were tried to be specified depending upon sex and class level. The survey consists of five point likert as (1) never, (2) rarely, (3) sometimes, (4) Often, (5) Always and consists of 21 questions. The general evaluation of the survey applied in the study is as follows.

1.00-1.80: Never; 1,81- 2,60: Rarely; 2,61- 3,40: Sometimes 3,41- 4,20: Often 4.21- 5,00: Always

As a result of validity and reliability studies of the survey used in the study, Cronbach Alpha internal reliability coefficient of the survey consisting of 21 questions was counted 0, 87. The answers of the students given to the survey depending upon the sex and class levels of the students having participated in the survey was counted by means of SPSS 17,0 statistical package programme and by using t-test and F test.

In this study, ‘general screening model’ , one of descriptive screening methods, was used. General screening model is ‘’ screening arrangements applied on a group, sample or sampling taken from universe, in order to pass judgement on the universe, in a universe consisting of wide range of elements.’ (Karasar, 1994: 79).

4. Findings

This part includes data regarding the survey and statistical findings and observation regarding these datas.

Table:1 Numeric data regarding the sex of students having participated in the survey

Sex	N	%
Female	277	38.37
Male	445	61,63
Total	722	100

In Table 1, numerical values regarding the sex of 722 secondary school students (classes of 9,10) having participated in the survey were given. Considering the table, it is seen that the number of female students is N= 277 (%38.37) and the number of the male student is N= 445 (%61.63).

Table. 2 t- Test results of secondary school students regarding critical thinking skills in accordance with sex

Sex	N	X	Ss	Sd	t	P
Female	277	78,90	9,53	720	0,42	0,68
Male	445	79,20	8,97			

p>0,05

When datas are examined in Table 2, considering the result of t- Test (p>0,05), it can be said that the thoughts of the secondary school students having participated in the survey regarding critical thinking skills did not change in accordance with sex.

Table. 3 t- Test results of secondary school students regarding critical thinking skills in accordancewith class level

Class	N	X	Ss	Sd	t	P
Class 9.	439	78,83	8,95	720	0,94	0,35
Class 10.	283	79,49	8,54			

p>0,05

When datas are examined in Table. 3, considering the result of t- Test (p>0,05), it can be said that the thoughts of the secondary school students having participated in the survey regarding critical thinking skills did not change in accordance with class level.

Table: 4 Arithmetic avarage values of the answers of secondary school students given to the survey applied in the study

QUESTIONS	A.A
1. When I encounter a matter, I consider it with prejudice without thinking.	2,48
2. When I encounter a matter, I realise whether the subject is from first hand or second hand.	3,71
3. I deduce regarding the explained matter and I can evaluate the reasons of these deductions.	3,83
4. I can understand pale in the matter and obscurities from explanations regarding the matter.	3,89
5. I can detect the problems in a matter, explain and define them.	3,93
6. When I encounter a problem, I can solve it, and make deductions.	3,84
7. While a matter is explained, I can analyse it by thinking the datas regarding that matter.	3,55
8. By means of my thoughts regarding a matter, I can improve hypostesis regarding the matter.	3,69
9. I can pass an accurate judgement on the matter, and I can come to a conclusion with my thoughts.	3,77
10. When I read a matter, I can understand the main idea and intention of the writer.	3,95
11. By means of my thoughts, I can make comments and can judge the matters.	4,16
12. When I encounter a matter, I can Express my thoughts regarding matter and I can defend my opnions.	4,13
13. I can explain my thoughts regarding a matter convincingly and logically.	3,84
14. By means of explanations regarding a matter, I can predict the ideas unexplained.	3,64
15. From the explanations regarding a matter, I can find the contradiction between reason and result.	3,71
16. While a matter is explained, I can concentrate on the matter together with my thoughts.	4,00
17. By means of explanations regarding a matter, I can establish striking connections regarding the matter.	3,65

18. When I encounter a matter, I can think critically, reasoningly and analytically.	3,88
19. When I encounter a matter, I can visualise it and can feel as the main chracter of the matter.	4,12
20. When I encounter a matter, I can be more elaborative thanks to my thoughts.	3,80
21. When I encounter a matter or an action, my thoughts do not misguide me.	3,56

General aritmetic average 3,77

When datas are examined in Table 4, it is understood that general arithmetic avarage of the answers is 3,77, and this avarage equals to (3.41–4.20: Often) in General rating Scale of Survey. As a result of these results, general arithmetic avarage of the survey is higher than expected (2.61- 3.40: Sometimes)

When datas are examined in Table 4, considering the general arithmetic avarage of the answers of the students regarding critical thinking skills (Min. 1, Max. 5) , the article having highest arithmetic avarage (X=4,16) is the article '' By means of my thoughts, I can make comments and can judge the matters'' And this result shows that the students have self-esteem regarding critical thinking. In survey the article that is the most conspicuous and have lowest arithmetic avarage (X=2,48) is that '' When I encounter a matter, I consider it with prejudice without thinking.'' By means of this article, it is understood that when the students encounter a matter, they prejudice the matter without thinking, trusting their feelings and unconsciously. And this result reveals a way of thinking.

5. Results and Suggestions.

In today' s world, the students are supposed to make decisions reasonably and commonsensically in the matters they encounter. However, generally the student gets excited and fails to stand their feelings. So, in order for students to make decisions accurately, and to act logically without getting excited in the event of matters, they should take 'critical thinking' lesson that is applicable beginning in primary school, lasting till high school.

When the students encounter a situation or matter they cannot overcome, and when they understand that they can not deal with this situation or matter, in order to get help, they should get in contact with their classroom teacher in primary school and with their counsellor in secondary school. So, the teachers should be subject to in-service training by specific agency and institutes and should be educated avantgarde regarding this matter in order to help the students accurately and approach the matters logically.

In the event of matters, problem or problems the students can encounter, the parents or students' guardians should attend courses given in various institutes, in order to help them thoroughly and to act more consciously. Thus, they should educate themselves ideally, so that they come to a level that they can help their children or people around them make decisions accurately.

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