The Effect of Web Tools 2.0 on Critical Thinking

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Abstract

This study was conducted to find an answer whether Web 2.0 Tools have an effect on critical thinking (CT). CT, one of the thinking skills, has been very significant in 21st century because we are being exposed to a large quantity of new information every day and it has been very difficult to cope with. CT has not been integrated overtly in the books that are designed by the Ministry of Education. Moreover, there are some practical issues about the integration of the CT. Twenty 8th grade students at Güzelyurt Secondary School in Kahramanmaraş, Turkey were the participants of this study. Critical Thinking Questionnaire (CTQ) and Web 2.0 Tools Questionnaire WTQ were applied in the beginning and at the end of the study to see if there was any difference. Along with the quantitative data, some prompts were given to be discussed online through Web 2.0 Tools. Moreover, interviews and minute papers were used after the discussion to find out students' CT dispositions qualitatively. After infusion of Web 2.0 Tools into our classes, we saw a remarkable increase in our learners' willingness to participate actively in this process. When we analysed the standard deviations and means, we could be able see that there existed a uniformly positive change. However, it was not a sudden shift from "Never" to "Always" because CT skills are not something that appears suddenly. In light of this, although the students did not seem to make a significant improvement, qualitative data revealed that students showed they had tendency to show some CT dispositions to some extent. Teachers, curriculum designers should become aware of the significance of teaching critical thinking skills to students and to make them conscious, particularly in these days since students mostly receive their education online due to the pandemic.

Keywords: Critical Thinking (CT), Web 2.0 Tools.

Introduction

What we firmly used to know could turn into opposite direction as human beings have gained more freedom compared to the past. According to Harris (1996) cited in Hopson (2018), "Information Age citizens must learn not only how to access information, but more importantly how to manage, analyze, critique, cross-reference, and transform it into usable knowledge". As a result, there has been a rapid shift from simple thinking to critical thinking. On the other hand, we are using technology on a daily and we are being exposed to new information at an incredible speed. It could be feasible with the teaching of thinking skills and encourage them to think by starting a process that alters or strengthens people's worldview, beliefs, opinions, attitudes, and behaviours with their own reasoning capacity. However, you cannot change an adult's mind easily, yet a child could be educated more easily as a belief of someone could easily affect them. Thus, students should not be left alone. They should be unshackled by many barriers like closed-mindedness, geocentricism and use their own thinking reasoning capacity. To achieve this, we need to have capable, analytic and reflective thinkers in order to compete with the large quantity of information and become an open-minded, critical and a democratic individual in the society. Children should look into things from different perspectives and think about the other possibilities as well. There are different ways, which could be used to enable students to gain CT skills. However, the common suggestion is that students should have opportunity to share ideas to look into matters from different angles. Almost one billion people are connected to

the internet and people can have access to anything they want with a single click. Therefore, World Wide Web (WWW), if used effectively, can provide this opportunity.

Background to the Study

The existent literature suggests that CT can be encouraged by engaging students in collaborative inquiry into authentic problems Halpern, 1998; MacKnight, 2000). Moreover, a number of studies indicate that student's CT skills can be taught through Web 2.0 tools, Web-based Instructions etc. For instance, a study of the development of CT skills using an innovative web 2.0 tool conducted by Eales-Reynolds L.J. et al. (2012), students chiefly utilize traditional resources when preparing work for assessment and they do not understand the concept and they do not exercise, CT skills in such activities. Varaki (2006) discussed the skills related to CT and three specific web-based strategies for teaching these skills. He articulated that there are some indications that internet is effective for promoting CT because they are more focused, they are more concrete, and they can deliver learning relevant feedback more often than traditional classroom instruction. In light of this, the students learn creative, critical, communicative and collaborative skills that are beneficial both in their personal and professional lives. Thus, the application of Web 2.0 Tools can provide students with showing those skills during their training and after. They are not confined to the areas in which they specialize, but they enable them to improve an open mind and flexible capacity of being adaptive to new situations. McLoughlin and Lee (2007) assert that Web 2.0 tools could be seen as a great potential to the needs of students, improve the learning and present new opportunities.

Statement of the Problem

The 21st century, the beginning of the Digital Age and a time of unprecedented growth in technology and information explosion, has been very significant in our life. In order to survive in this age, we need to have the skills of this age. CT is one of the most important ones, which we have to enable our students to improve. As Varaki (2007) states that critical thinking is a higher order thinking skill that only shows up when students can go through challenge-based instruction and related instructional designs. This can increase students' involvement and assist them in seeing various applications. At the same time, students can easily accept what is told by the authorities, be caught in

their own thinking or they can be confined to be narrow-minded easily; whereas, they can be encouraged to use their own thinking reasoning capacity appropriately and systematically. To achieve this, we must teach students to be a purposeful critical thinker. In Turkey, CT is not much of value as well. According to a study conducted by Munzur (1999), books prepared by the Ministry of education fail to impose creative thinking, critical thinking and problem solving (Cited in Keskin, 2010). Teachers do not know how to teach CT and being aware of the importance of these skills and infusing those skills into the curriculum is a remarkable step. However, teaching these skills entails practice and guidance as there are many factors, which can affect the teaching-learning process. Current efforts to promote CT in the social studies will fail unless teachers know what it is, why it is important, and how to use it in the classroom.

Purpose of the Study

Education is a process that students get through which they acquire many qualities. They need to have a general understanding about what is going on around with the help of inquisitiveness with some tools. That is why, thinking abilities like CT play important role in education. The purpose of this study is to find out whether students' CT skills integrated into the curriculum for the 8th grades' book prepared by the Ministry of Education could be improved through Web 2.0 tools.

Research Questions

1. Were students using certain critical thinking skills before the study?
2. What were the perceptions of the students about Web 2.0 tools before the study?
3. Were students using certain critical thinking skills after the study?
4. What were the perceptions of the students about Web 2.0 tools after the study?

Literature Review

What is Thinking and Why Develop It?

Thinking is a complex system including receiving information from the environment, memorizing the information subconsciously or consciously. Baron (1993) states that thinking is a mental activity that is to be suspicious what to do, what to believe, or what to desire or seek. Thinking is transferring the objects and events of the world into symbols. In line with this, the brain does many

functions like inferring meaning from symbols, establishing hypothesis, calculating and producing the symbols. Paul and Elder (2004) highlight the importance of thinking in education. They state, "Shoddy thinking is costly, both in money and in quality of life. Excellence in thought, however, must be systematically cultivated" (p. 1). That is why, it is significant that thinking is valued and made important. We need to give time for students to think. Teachers should pose questions and we should expect them to come up with immediate answers. If we want higher quality learning, then students need time for more considered responses.

Critical Thinking

Although a variety of definitions has been suggested, most of them include the same underlying principles: it refers to the use of cognitive skills or strategies that increase the probability of a desirable outcome. Cotrell (2005) defines CT as a cognitive activity, linked with using the mind by learning to think in critically analytical and evaluative ways means using mental processes such as attention, categorisation, selection, and judgement. According to Judge et al. (2009), CT is mainly a questioning, challenging and perceiving wisdom involving checking ideas and information from an independent position and then questioning this information with our own values, attitudes and personal philosophy. Fisher (2001) divides CT into three significant components: a readiness to reason, willingness to challenge and a desire to truth. He also suggests that there may be one way for being right but there are infinite ways of being wrong. Critical thinking is a skill that should be applied to all aspects of education. Students need to be able to think critically about whatever they use in their studies; they need to be critical; they should be capable of making arguments and looking from different perspectives and can express their own opinions based on sound judgments. The definitions that are available in various sources are quite diverse. Abrami et al. (2008) states that besides being better students, critical thinkers have a better future as operative and contributing adults.

Critical Thinking in Language Learning and Teaching

Education is important, as we need individuals who do not just accept whatever they receive but evaluate and criticize things they encounter everywhere. It aims at raising individuals who are

sensitive to global and local changes, and can easily be adapted to ever-changing technology and new concepts. As an education student, one of the most important skills you need is the ability to think both critically and objectively and present a well-established argument (Judge et al, 2009)., Halpern states that only with the development of critical thinking dispositions, can students succeed in school and throughout their lives (Halpern, 1999). Bailin & Siegel (2003) argued that "critical thinking is often regarded as a fundamental aim and an overriding ideal of education" (p. 188). Paul (2006) contended that in a world of accelerating change, intensifying complexity and provide interdependence, critical thinking is now a necessity for economic and social survival. In addition, the optimal places to raise such equipped individuals are schools that shape the individual from certain to ages up to death. That is why; our schools should be one of the most significant agents in education, where the heart of a nation pulses.

Web 2.0 Tools and Education

Since 2003, there has been a great leap of social computing, such as blogging, podcasting, collaborative content (e.g. Wikipedia), social networking (e.g. Twitter, Facebook), multimedia sharing (e.g. YouTube), social tagging and social gaming. They provide new ways of for lifelong learning, supporting the vision of personalized future learning spaces in the knowledge society. Web 2.0 tools rely on the concept of the Internet as a platform, and include blogs, wikis, podcasts, micro blogs, social networks. They are set of tools and processes that let everybody to easily create digital content and collaborate with others without any special programming skills.

Web 2.0 Tools & the Impact on CT

CT could be positively supported by the application of Web 2.0 tools within the educational context. Educators should guide their students for the increasingly important task of filtering Web-based content and discerning whom and what to trust. Duffy & Bruns (2006) state that, when using a blog student can demonstrate their critical thinking, creativity, taking risks and making use of the language. In light of this, the students acquire creative skills, critical, communicative and collaborative abilities that could be beneficial both in academic and professional contexts. By using those tools students become more capable to show that the skills acquired during their education are not long

confined to the areas in which they specialize, however they provide them to improve an open-mind and flexible capacity of being adaptive to new environments.

Methodology

Research Design

This study was designed as a case study to develop CT skills. Both a qualitative and a quantitative research designs were used. This study provides data about the progress of CT skills and Web 2.0 Tools of the participants and also about the perceptions of the participants. The data were collected through Critical Thinking Questionnaire (CTQ), Web 2.0 Tools Questionnaire (WTQ), semi-structured interview, observations and minute papers.

Participants

The participants of the study are twenty, 8th grade students who attended Güzelyurt Secondary School in Kahramanmaraş. At the beginning, one of the participants was excluded since his irregular attendances. Thus, nine male students and eleven female students participated in the study. The data were obtained from all of the students except one student. Their ages range between 14 and 15. The participants had been taking English lesson for four hours a week during a year. Most of them belong to the low socio-economic and cultural level.

Procedure

In the very beginning of the study, minute papers were given to students to measure to what extent they showed CT dispositions. CTQ (see Appendix 1) and WTQ (see Appendix 3) were also applied in the beginning of the study after minute papers (See Appendix 12). After that, some prompts to elicit critical answers from the participants were prepared. In preparing those prompts that were going to be discussed online through Web 2.0 Tools, the researchers relied on the book and the current unit. Then, the prompts inspired from the books were shared online (blogs, wikis etc.) and participants submitted their answers as shown in figures 1, 2 and 3. During this procedure, the researcher encouraged them to discuss their answers and write their comments independently. To fortify this procedure; interviews was used after the discussion to find out students' CT dispositions. At the end of

the study, CTQ and WTQ were applied at the end of the study to see whether there was any improvement or not.

Instruments

We used as many instruments as possible to gather data about CT skills because those instruments fortified the study to be more valid. At the beginning of the study, CTQ was applied whether the participants have CT skills or not. If so, to what extent do they have CT skills? The same questionnaire was applied at the end of the study. The questionnaire comprises of 16 statements. These statements are associated with the Essential Intellectual Traits suggested by Paul, R. and Elder, L. (2001) in the book "The Miniature Guide to Critical Thinking – Concepts & Tools" The statements in the questionnaire were closed-type and scaled statements. Only some of the skills were applied for the study. These were intellectual humility, intellectual courage, confidence in reason, intellectual integrity, fair-mindedness and intellectual empathy.

Table 1

Affective Strategies in CTQ (Skills)

	Items	Strategies
1	2 and 6	Fair-mindedness
2	1 and 5	Intellectual Empathy
3	11 and 14	Intellectual Humility
4	8 and 13	Intellectual integrity
5	7 and 12	Intellectual courage

Note. CTQ = Critical Thinking Questionnaire.

Table 2

Cognitive Strategies-Micro Skills

	Items	Strategies
1	9 and 15	Confidence in reason

Note. CTQ = Critical Thinking Questionnaire.

The questionnaire was simplified and translated into Turkish by another English teacher. The questionnaire included two scales to investigate: First, Affective Strategies and secondly Cognitive Strategies-Micro Abilities. Affective Strategies were intended to be gauged through CTQ. The mainstay for focusing on affective strategies was the suggested CT skills for children by Elder and Paul, (2001). Items included in each scale are presented in the form of tables for data analysis purposes. (*Table 1* & *Table 2*) The items were chosen according to Paul & Elder's (2006) "The Miniature Guide to Critical Thinking for Children" and "The Miniature Guide to Critical Thinking-Concept & Tools."

The item 2 aimed to exercise Fair-mindedness, one of the affective strategies. Paul, R. and Elder, L. (2006), states that is the consciousness of the need to treat all viewpoints alike, without reference to one's own feelings or vested interests, or the feelings or vested interests of one's friends, community or nation. It implies adherence to intellectual standards without reference to one's own advantage or the advantage of one's group. Item 3 and 16 aimed to assess Intellectual Autonomy, one of the affective strategies. Intellectual Autonomy is the rational control of one's beliefs, values, and inferences. The ideal of critical thinking is to learn to think for oneself, to gain command over one's thought processes. They suggest that Intellectual Autonomy entails a commitment to analysing and evaluating beliefs on the basis of reason and evidence, to question when it is rational to question, to believe when it is rational to believe, and to conform when it is rational to conform. Items 4 and 10 are the Intellectual Perseverance. They state that it is a recognition of the need to be true to one's own thinking; to be consistent in the intellectual standards one applies; to hold one's self to the same rigorous standards of evidence and proof to which one holds one's antagonists; to practice what one advocates for others; and to honestly admit discrepancies and inconsistencies in one's own thought and action. Items 1 and 5 are the Intellectual Empathy which is a consciousness of the need to imaginatively put oneself in the place of others in order to genuinely understand them, which requires the consciousness of our egocentric tendency to identify truth with our immediate perceptions of long-standing thought or belief. This trait correlates with the ability to reconstruct accurately the viewpoints and reasoning of others and to reason from premises, assumptions, and ideas other than our own. This

trait also correlates with the willingness to remember occasions when we were wrong in the past despite an intense conviction that we were right, and with the ability to imagine our being similarly deceived in a case-at-hand. Items 6 and 11 is Intellectual Humility which is the consciousness of the limits of one's knowledge, including a sensitivity to circumstances in which one's native egocentrism is likely to function self-deceptively; sensitivity to bias, prejudice and limitations of one's viewpoint. Intellectual humility depends on recognizing that one should not claim more than one actually knows. It does not imply spinelessness or submissiveness. It implies the lack of intellectual pretentiousness, boastfulness, or conceit, combined with insight into the logical foundations, or lack of such foundations, of one's beliefs. Items 8, 13 and 14 are Intellectual Integrity. It is the recognition of the need to be true to one's own thinking; to be consistent in the intellectual standards one applies; to hold one's self to the same rigorous standards of evidence and proof to which one holds one's antagonists; to practice what one advocates for others; and to honestly admit discrepancies and inconsistencies in one's own thought and action. The last items of Affective Strategies, 7 and 12 is the Intellectual Courage which is consciousness of the need to face and fairly address ideas, beliefs or viewpoints toward which we have strong negative emotions and to which we have not given a serious hearing. This courage is connected with the recognition that ideas considered dangerous or absurd are sometimes rationally justified (in whole or in part) and that conclusions and beliefs inculcated in us are sometimes false or misleading. To determine for ourselves which is which, we must not passively and uncritically "accept" what we have "learned." Intellectual courage comes into play here, because inevitably we will come to see some truth in some ideas considered dangerous and absurd, and distortion or falsity in some ideas strongly held in our social group. We need courage to be true to our own thinking in such circumstances. The penalties for nonconformity can be severe. Items 9 and 15 are Cognitive Strategies. It is the confidence in Reason which is one's own higher interests and those of humankind at large will be best served by giving the freest play to reason, by encouraging people to come to their own conclusions by developing their own rational faculties; faith that, with proper encouragement and cultivation, people can learn to think for themselves, to form rational viewpoints, draw reasonable conclusions, think coherently and logically, persuade each other by reason and

become reasonable persons, despite the deep-seated obstacles in the native character of the human mind and in society as we know it.

Furthermore, WTQ was administered together with the CTQ. It aimed at eliciting their perceptions about Web 2.0 Tools; whether they had any training about them, which one(s) of the tools they were using in their professional or personal life, how they rated themselves while using Web tools, what their aims were while using them, to what extent they had a role in participating, how many hours they were spending on the internet in a week, for what reason they used the internet, whether they ever collaborated online, what they affected their education life, whether they had a personal computer and finally whether they had internet connection at home?

Another instrument used to collect data was the Semi-Structured Interview. It was conducted during the research for gathering information about the variables. It is a method of research used in the social sciences. While a structured interview has formalized, limited set questions; a semi-structured interview is flexible allowing new questions to be brought up during the interview as a result of what the interviewee says. The interviewer in a semi-structured interview generally has a framework of themes to be explored.

Another instrument was Minute Papers. Minute Papers is a very commonly used classroom assessment technique. It really does take about a minute and, while usually used at the end of class, it can be used at the end of any topic discussion as well. Its major advantage is that it provides rapid feedback on whether the professor's main idea and what the students perceived as the main idea are the same.

Data Collection

The data was collected through CTQ, Semi-Structured Interview, Minute Papers and Web 2.0 Tools Questionnaire. In the beginning of the study, the participants were informed about aim and scope of the study. Data was first collected through CTQ to reveal to what extent the participants have CT skills. After the CTQ, they were given WTQ. The participants were told to be fair while responding to the statements in the questionnaires. The same questionnaires were applied at the end of the study to reveal whether there was any development or not.

Data Analysis

The instruments were analysed in two ways. The questionnaires were analysed quantitatively. Statistical Programming for Social Sciences (SPSS) was used in the analysis of the CTQ. CT skills development of the participants within four and a half month was first identified through descriptive statistics to find whether there were any changes between the responses of the participants at the beginning and at the end of the study. Descriptive Statistics were analysed through mean, standard deviation and *p* value. The semi-structured interviews, minute papers via prompts to support the quantitative data were analysed qualitatively. The responses of the participants in the beginning and at the end of the study was compared and contrasted to see if there has been any change after the study.

Findings

The overall analysis of the data presented in *Table 3* reveals that there is uniformly positive correlation between pre and post administration of the questionnaires. The participants seemed to use their preferences during the period the tasks requiring higher order skills, especially the *Item 3* and *Item 4*. The qualitative data will shed more light on the quantitative data.

Table 3

Analysis of CTQ (N = 20)

	Items	Pre-test		Post-test		
		Mean	SD	Mean	SD	*p*
1	I try to understand my parents.	1.83	0.78	1.94	1.05	.49
2	I can't believe a lot on what I see on TV.	2.22	1.16	2.38	1.03	.65
3	I try to do my own thinking, to figure things out for myself.	1.77	0.64	2.22	0.87	.02
4	When reading is hard, I stick to it so I can learn to read better.	1.33	0.48	1.72	0.82	.03
5	Whenever I disagree with people, I try to see things the way they do.	2.33	0.97	2.27	0.89	.71
6	I shouldn't say things are true when I don't really know they are.	2.61	1.28	2.05	1.21	.21
7	I shouldn't be afraid to disagree.	2.50	1.46	2.05	0.99	.16
8	I try to be the kind of person I expect others to be.	2.27	1.22	2.00	0.84	.23

9	I ask lots of questions in a learning environment.	2.44	1.04	2.66	1.02	.40
10	Sticking to a problem is always better than giving up.	1.88	1.36	2.00	0.84	.69
11	There is a lot that I don't know.	2.55	1.04	2.50	0.98	.87
12	I should be ready to speak up to for what I think is right, even if it is not popular with my friends or the kids I am with.	2.05	1.10	2.22	1.11	.64
13	When I get angry, I ask myself why I am angry.	2.38	1.33	2.72	1.40	.42
14	Because I expect others to respect me, I respect them. Because I expect others to consider my feelings, I consider their feelings.	1.27	0.57	1.55	0.85	.17
15	I enjoy finding answers to challenging questions.	2.27	1.17	2.11	1.02	.48
16	It's good to listen to others to find out what they are thinking, but I must always do my own thinking to decide who and what to believe.	2.55	1.04	2.38	1.24	.57

Note. CTQ = Critical Thinking Questionnaire *$p < .05$.

Item 2 & 6: Exercising fair-mindedness

Item 2 and 6 aimed to develop fair-mindedness. Students were given a prompt via *www.plus.google.com* and they wrote their comments under the heading and discussed it. The prompt was "Is it true that there are fewer women in the parliament?" The values indicate that the means rose and standard deviations were close to one in the item 2. However, in the item 6, the scores did not rise but the standard deviation was closer to one compared to the pre-test. There was uniformly positive change that occurred in the participants' preferences of fair-mindedness.

From the minute papers

Student 15: It is true because women should not be in every milieu.

Student 17: It is not appropriate for women to be in the parliament because men discuss important things.

From the first interview

T: Is it right that there are 550 members in the parliament?

S1: It is not a good thing, teacher.

T: Why do you think so?

S1: Because they are paid a lot.

T: OK. What if is it good for democracy?

S1: What is democracy?

T: Many ideas in a community

S1: That is reasonable, teacher.

From the students' comments online

Student 6: If I were a woman, I would give a right to men.

Student 3: I think women are more vulnerable. That is why there must be fewer women.

Item 1 & 5: Exercising intellectual empathy

Item 1 and 5 aimed to develop empathy. The students were asked some questions online via *www.plus.google.com* about women-men inequality and the Stephan Hawkins' being disabled to exercise empathy. They discussed those issues and commented to each other. The values that were taken from the questionnaires indicate that there was a positive change in both of the items.

From the minute papers

Student 3

1. This is the rule of the nature: men shouldn't do the housework.

2. We should always empathize. It is essential for every issue. some people do not like disabled people, but they don't think it may occur to them. Every problem could be solved with empathy.

From the students' comments online

Student 18: Being disabled is the last thing human wants. We should value our health and thanks God.

Student 15: Being disabled is a bad thing. It may happen to anyone. If I were disabled, I would not …

From the first interview

T: What is it like to be a female?

S1: It is not a good thing, teacher.

T: Why do you think so?

S1: They are always prone to violence.

T: Ok! What would you do if you were a subject like this?

S1: I do not know

Item 11 & 14: Exercising intellectual humility

Item 6 and 11 aimed to develop intellectual humility. The students were given a prompt online via *www.plus.google.com* to exercise intellectual humility; they were given a prompt about the causes of global warming. The values indicate that there was a positive change in the *item 14*, but negative change in the item 11 occurred in the participants' preferences of humility.

From the minute papers

Student 5: No one can now everything, there are many things that we do not know.

Student 19: We have a mistake even though we struggle. We cannot look from different perspectives. We cannot know everything. We have many flaws.

From the students' comments

Student 3: I think, there are more precautions to be taken.

Student 9: There are many precautions. We can use TV and posters.

From the first interview

T: How many capitals of a country do you know?

S1: Not many, teacher.

T: Can you count?

S1: Ankara, Tokyo...

T: Do you only two?

S1: Yes, teacher.

T: I think, there are about two hundred countries

S1: Are they so many?

T: Yes.

Item 8 and 14: Exercising intellectual integrity

Item 8 and 14 aimed to develop intellectual integrity. The students were asked some questions online *www.plus.google.com* to exercise intellectual integrity and they were given a prompt about what we notice while buying a new house. The values indicated that there was a positive change in the item 14, but not in the item 8 occurred in the participants' preferences of Integrity.

From the minute papers

Student 7: When we decide on something, the rank of importance is important. We should consider, decide rationally when we are sure.

Student 3: We should think rationally when we decide on something. We should pay attention to it. We should first take the importance into account.

From the students' comments

Student 13: It must be safe and with a garden and must not be in an earthquake area.

Student 16: While buying a house, it must be with a garden. There should not be houses around. And it has to be nice-shaped and it must stand against earthquakes.

Item 7 and 12: Exercising intellectual courage

Item 7 and 12 aimed to develop intellectual courage. The students were given a prompt online via *www.plus.google.com* about Galileo's being courageous to explain that the earth is round. The values indicated that there was a uniformly positive change in the item 12, but not in the item 7 occurred in the participants' preferences of Integrity.

From the minute papers

Student 18: If I were him, I wouldn't be like him. I do not care people believe me or not.

Student 7: If I were him, I wouldn't continue because I will die in the end. For this reason, I do not tell the truth.

From the students' comments

Student 6: If I were him, I would tell the truth. I would risk my life.

Student 13: If I were Galileo, I would keep my words.

From the students' interviews

T: Your friend has cheated in the exam; your teacher has seen that you have seen. Would you tell truth?

S1: I would tell the truth

T: What if you lose your friendship?

S1: I would do that again

T: what if he or she offended?

S1: I would tell the truth anyway.

Item 9 and 15: Exercising confidence in reason

Item 9 and 15 aimed to develop confidence in reasoning. Students were given a little complicated video via *www.plus.google.com* and required to reason in confident. They were a given video prompt to evaluate confidence in reason. The values indicated that there was a positive change in the item 9, but not in the item 15 occurred in the participants' preferences of Integrity.

From the minute papers

Student 17: People shouldn't believe what they see first. They must wait and see.

Student 20: I think, we should criticize everything and we shouldn't believe everything. We should wait in patience. We should let the things go.

From the students' comments

Student 7: I think, he will make it smaller.

Student 3: Because he is carrying a drill and walking towards dog.

From the students' interviews

T: Do you think there are angels?

S1: Yes.

T: How do you know? Can you see them?

S1: No, I can't

T: How can you prove it?

S1: I can't teacher

Table 4
Analysis of Item 1 in WTQ

		Pre-test Total Answers	Post-test Total Answers
How did you learn Web 2.0 Tools?	Educators	1	14
	Search Engines	6	8
	Friends	11	12
	Courses	-	2
	News	2	4
	Other	1	3
	I have never heard	1	-

Note. WTQ = Web 2.0 Tools Questionnaire.

The purpose of this item was to understand students' choices on how they learned Web 2.0 Tools. According to the item 1, the most important development among the answers was “educators”. While only one of the students learned Web 2.0 Tools from educators in the pre-test, 14 out of 18 students changed their answers.

Table 5

Analysis of Item 2 in WTQ.

Have you ever received education about Web 2.0 Tools?		Yes	No
	Pre-test	1	17
	Post-test	15	3

Note. WTQ = Web 2.0 Tools Questionnaire.

The purpose of this item was to find out whether they received any education about Web 2.0 Tools. This item 2 is closely related with the item 1 because 14 students chose the educators in the previous item. Interestingly, 15 students admitted that they received education on Web 2.0 Tools. Only one student said that he/she received instruction and 17 students said they didn’t receive any education on Web 2.0 Tools in the pre-test, while 15 students said that they received education in the post-test.

Table 6

Analysis of Item 3 in WTQ

What do you think of the following Web 2.0 Tools?		*Pre-Test*		*Post-Test*		
		Mean	SD	Mean	SD	*p*
1	Bookmarks	2.88	1.32	3.16	2.61	.680
2	Collaborative Writing Online	4.00	1.49	2.27	1.12	.002
3	News, Blogs etc.	3.72	1.48	2.33	1.08	.005
4	Photos and Digital Imaging	2.88	1.36	2.05	1.34	.030
5	Instant Messaging	2.72	1.70	2.00	1.37	.011
6	Video Sharing Tools	3.16	1.79	1.88	1.07	.001

7	Social Network Platforms	2.66	1.64	1.94	1.10	.030

Note. *$p < .05$; **$p < .01$.

The overall analysis of the item 3 showed that there has been meaningful development in all sub-items except sub-item one. There is no meaningful development in sub-item 1 because they didn't receive any education about bookmarks.

Table 7

Analysis of the Item 4 in WTQ

		Pre-Test Total Answers	Post-Test Total Answers
For what reason do you use the internet?	Chat	9	15
	Education	14	17
	Surf	1	8
	Social Network	6	12
	Entertainment	11	12

Note. WTQ = Web 2.0 Tools Questionnaire.

Table 8:

Analysis of the Item 5 in WTQ

		Yes	No
Have you ever experienced any collaborative writing online?	Pre-test Answers	1	17
	Post-test Answers	15	3

Note. WTQ = Web 2.0 Tools Questionnaire.

The aim of this item was to help students discuss what activities they involved in the classroom. The item 5 in the WTQ has an important value because in the beginning of the study seventeen of the participants said "No" while only one student said "Yes". At the end of the study, there has been a considerable raise in the students' perceptions.

Conclusion and Discussion

The purpose of this study was to find out whether Web 2.0 Tools have an effect on young learners' CT skills. We aimed at finding answers to the questions below:

Were Students Using Certain Critical Thinking Skills Before the Study?

The findings revealed that students were not using any certain CT skills in the beginning. In addition, the mean and standard deviations of the items showed that the responses were scattering.

During administration of minute papers, they showed some barriers of CT dispositions such as egocentrism, sociocentrism, closed-mindedness, prejudice, scape-goating etc. in the data analysis section. According to Snyder & Snyder (2008), "Lack of training, limited resources, biased preconceptions, and time constraints conspire to negate learning environments that promote critical thinking" (p. 1). For not surprise, during the interviews, some of the students went on showing the barriers of CT, yet some of them seemed to be showing CT dispositions such as truth-seeking, open-mindedness, analyticity, systematicity, CT self-confidence, inquisitiveness, and maturity of judgment proposed by Facione & Facione (2008).

What Were the Perceptions of The Students About Web 2.0 Tools Before the Study?

The use of information technology, and especially Web 2.0 tools, was essential in maintaining contact that makes a bond between us. This lets our students reach anything they want just a click away, and at the same time giving them a sense of critics to work on the areas of their learning that they consider suspicious. That is why, these tools may promote CT an environment and at the same time, helps prepare them for the new things that they see for the first time. Before the study, almost all the students were aware of the Web 2.0 Tools. However, they did not know what exactly they were and how to use it. The statistics showed that they had received no education before. The item 2 (Table 5) demonstrated that they had neither learned these tools nor received education about these tools. It was also obvious in Item 3 that they did not receive any education on the sub-items. The item 5 (Table 8) in WTQ had an important value because in the beginning of the study seventeen of the participants said “No” This means that almost all the students were not involved in a collaborative activity before.

Were Students Using Certain Critical Thinking Skills After the Study?

When we analysed the standard deviations and means, we could be able see that there existed a uniformly positive change. However, there was no overt shift from “Never” to “Always” because CT skills are not something that appears suddenly. According to the study conducted by Abrami P.C. et al. (2008), the scores of the CT skills were not uniformly positive. They found some negative effects. This shows that we cannot always accept a sudden positive change. They further contended that improvement in students' CT skills and dispositions cannot be a matter of implicit expectations.

Tendencies are dispositional, and we propose that good thinking is indeed a dispositional matter involving appropriate abilities, sensitivities and inclinations.

In light of this, although the students did not seem to make a significant improvement, qualitative data revealed that students showed they had tendency to show some CT dispositions to some extent. Each week, the study revealed that students were able to overcome their barriers for CT with the help of the researcher. All in all, the findings of this study demonstrated that it is possible to promote critical thinking abilities and dispositions in the students by means of Web 2.0 Tools. In addition to the qualitative data, students' English exam (TEOGS: Entrance Exam from Primary Education to High School) which is applied by the Minister of Education in the first semester has been significantly improved in the second semester with a considerable raise from 48 to 57.

What Were the Students' Perceptions About Web 2.0 Tools After the Study?

After infusion of Web 2.0 Tools into our classes, we saw a remarkable increase in our learners' willingness to participate actively in this process. Almost all of the items show that the students' views about Web 2.0 Tools have changed in a positive way drawn from the WTQ. This means that student can adapt to technology very easily.

Implications of the Study

This study is important because it showed that the Web 2.0 Tools could be beneficial for 8th grade students in developing CT skills. In other words, using Web 2.0 Tools as a community used by the participants as a discussion space could open up the path for the ones who would like foster students' CT skills and dispositions. According to Yang (2009) "... by using blogs as a platform for reflection, participants got more opportunities to make comments and challenge each other's viewpoints. They could still converse about or express what had been left out in the traditional classrooms. (p. 18) Furthermore, according to a study conducted by Aydın (2014), the use of blogs enhances reading processes, results in positive perceptions of reading, encourages classroom discussions, and develops literacy and critical thinking skills. Furthermore, teachers should become aware of the significance of teaching critical thinking skills to students and to make them conscious agents in the future. According to Thompson (2011), "As part of their professional development

teachers may examine more closely how they implement curricula or interpret educational standards and program goals and collaboratively agree on the applicability of critical thinking in and across their disciplines" (p. 6). In addition, this study may suggest some useful implications for curriculum designers who would like to foster students' CT Skills in a more influential way rather than traditional methods. Thus, Using Web 2.0 Tools might foster students to be involved in controversial activities. All the findings, implications, and suggestions mentioned in this study may establish a basis for a start-up point, as it indicates how to administer the process of using Web 2.0 Tools to develop students' CT skills.

Suggestions for Further Research

This study can be applied with more participants, and the observation can be done by more than one researcher. The whole lesson may also be recorded on a camera to reach more eligible date to evaluate the participants' CT skills. The study may also be executed by collaborating with teachers of Social Sciences, Math or others. By this way, we can see the effect of the technique on CT skills of the students more deeply. Another study to see the effect of Web 2.0 Tools may be conducted with two classes; one group would be evaluated through traditional methods and the other through Web 2.0 Tools to be able to compare the results. Some other data collection methods could have been employed in order to provide deeper analysis. The findings also showed that a 15-week course could have not been enough to instruct students to use the components of CT because it is not a set of skills or dispositions that can be instructed in such a period.

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