Developing Iranian EFL Learners’ Critical Thinking Skill via Electronic Homeworking

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Abstract

SLA scientists and scholars search for procedures and techniques to make the students active critical thinkers. This study wants to investigate the effectiveness of electronic homeworking in EFL learners’ critical thinking skill. For this purpose, 60 EFL college students were chosen randomly. They were divided into two groups, one experimental group (n=30) and one control group (n=30). First, a pretest on critical thinking was given to both groups. Then, the teacher of experimental group gave different tasks and assignments in electronic format to the students during 8 sessions. The tasks and assignments were chosen based on some features such as novelty and having thinking holes, attractiveness for forcing students to think critically, relativity to their background, activating students’ creativity, etc. For example, students were supposed to think critically and search for a specific topic and write a summary based on their own background and interpretation. At the end, a post2test was given to the students in both groups. The students’ scores from the post-test were compared through t-test. The findings of the study revealed a significant relationship between using electronic homeworking and improving critical thinking skill. The results of the study can be beneficial for those who are interested in improving critical thinking skill through using electronic means of communication.

Keywords: Critical thinking, Electronic homeworking, Electronic tasks, E-learning

1. Introduction

It is commonly believed that homework is an important aspect of students’ education because it allows independent practice of concepts encountered in class. Smolira (2008) states that the goals of homework are to boost students’ knowledge, enhance retention, and encourage students to master the concepts at the time they are taught as cited in Cooper, Robinson, & Patall, 2006, and Trautwein & Koller, (2003). He states that whether homework is helpful may be a factor of feedback timing. He points out that graded homework typically isn’t returned to the student until at least the next class meeting, which delays feedback to the student. By then, the class likely has moved on to another topic reducing the usefulness of the feedback for learning. He says that online homework may provide a solution to this problem, as online homework programs provide instant feedback. Online homework is a component of e-learning, defined as learning and/or teaching that is promoted online through network technologies (Garrison & Anderson, 2003, cited in Williams, 2012).

Education has not stayed inflexible towards the fundamental changes taking place in other areas of knowledge. The impact of those changes on the educational area is increasingly evident. New technologies are producing changes in the conventional pedagogical models. They have increased the array of possibilities for the limited traditional teaching-learning process in which the teacher is the only source of knowledge, the chalk and board are the best teaching aids and the classroom is the only place where this process can be appropriately carried out (Rey & Rosado, 2001, p.12, cited in Fahim et all., 2011).
According to Hambrecht and Company (2000), electronic education is effective because it “offers collaboration and interaction with experts and peers as well as a higher success rate than alternatives” (p.10). Electronic learning provides faster and greater access to information for education (Hamilton et al., 2001, cited in Maynard & Cheyne, 2005). However, focus should be given to the implications of taking on this e-learning initiative, including financial support, staff workload and changing roles (Wilson, 2003, p.7). Camenson (2007, p.2, cited in Fahim et al., 2011) also stated that EFL students only spend a few hours per week studying English, have little exposure to English outside the classroom, have little opportunity to practice their newly-acquired language skills, and have a native language background in the classroom. There are only 4 hours per week for the English classes in most Language institutes and schools. Teachers must make difficult choices about how to use that limited time to promote language learning and there is an urgent need for them to find an effective self-study approach for students to enlarge their vocabulary size. Grace, (1998: 8) reasons that due to “the class time constraint, vocabulary reinforcement and studying is frequently the responsibility of the student outside the classroom”.

2. Literature Review

2.1. Basics of critical thinking

Critical thinking is difficult to define and even more difficult to measure (Abrami, et.al, 2008). One of the definitions of critical thinking stated by Epas is “critical thinking is self-directed thinking and a self-monitored process that requires effective problem solving abilities” (p. 4, as cited in Colby, 2009). Critical thinking includes the ability to analyze and evaluate one’s own thinking processes. Huff (2000) provides several definitions of critical thinking and emphasizes the relevance of critical thinking and e-learning. The concept is that good critical thinking is not an innate or natural ability for most students but that they can be taught through effective pedagogical methods to learn to think critically. Students need the ability to question, reason, and consider alternative perspectives but also to evaluate their own biases, values, claims, and belief systems (Huff, 2000, cited in Anderson, 2011).

The Delphi Committee of the American Philosophical Association’s Delphi panel describes critical thinking as the ability to engage in purposeful, self-regulated judgment (Facione, 1990 as cited in Abrami, Bernar, Borokhovski, Wade, Surkes, Tamin, & Zhang, 2008). Ideal critical thinkers are first and foremost inquisitive, informed, open minded, fair, realistic about bias, and careful in making judgments (Abrami, et.al, 2008). Critical thinking consists of specific skills as opposed to psychological attributes. Critical thinking skills can be transferable across contexts although there is debate on how to teach skills (generalist or specificist perspective) (Abrami, et.al, 2008, cited in Anderson, 2011).

Education psychologists, such as Thomas & Smoot (1994) and Huit (1998) have stated that critical thinking is a very important element of schooling in the 21st century. Huit (1998) stipulates that in the information age, thinking plays a significant role in one's success in life. He goes on to say that the movement toward the information age has shifted attention to good thinking as a significant element of life success. These changing conditions require new outcomes, such as critical thinking, to be embarked upon as a focus of schooling. Old standards of simply being able to score well on a standardized test of basic skills, though still appropriate, cannot be the sole criterion based on which to judge the academic success or failure of students.

Similarly, Chaffee (1985) and Paul (1995) stated that enhancing students' critical thinking abilities is the core of meaningful education. Chaffee (1985) explains that meaningful education halts students from involving in the unreflective learning of
information, and equips them with the tools necessary to understand thoroughly the world they are in.

According to Fok (2002), some teachers believe that critical thinking cannot be taught, and some think that it does not need to be taught deliberately explicitly. Although some teachers support the idea of teaching students critical thinking abilities, they feel that they don't have the capacity or confidence to do it. In addition, contextual constraints such as those imposed by exam-oriented cultures and the heavy emphasis placed on the rote learning of facts and information to excel on tests may exert a harmful effect on the students' overall development including their development of creative and critical thinking abilities.

Theorists and educators have provided some various definitions of critical thinking. Siegel (1988) calls critical thinking “the educational cognate of rationality” (p.32). Lipman (1991) defines it as healthy skepticism, whereas Norris and Ennis (1989) say “reasonable and reflective thinking that is focused upon deciding what to believe and do” (p.3). Elder and Paul (1994) postulate that critical thinking is the ability of thinkers to take charge of their own thinking and develop sound criteria and standards for analyzing and assessing their own thinking. Maiorana (1992) mentions that the purpose of critical thinking is to achieve understanding, evaluate viewpoints, and solve problems.

“We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criterio-logical, or contextual considerations upon which that judgment is based. Critical thinking is essential as a tool of inquiry. As such, critical thinking is a liberating force in education and a powerful resource in one’s personal and civic life. While not synonymous with good thinking, critical thinking is a pervasive and a self-rectifying human phenomenon. The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry. Thus, educating good critical thinkers means working toward this ideal. It combines developing critical thinking skills with nurturing those dispositions which consistently yield useful insights and which are the basis of a rational and democratic society” (Facione, 1990, p.2, cited in Fahim, Sheikhly, 2011)

Critical thinking is defined in terms of skills, intellectual standards, elements of reasoning, and intellectual traits by Paul and Elder (2008:3). They mention that critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning or communication, as a guide to belief and action. In its exemplary form, it is based on universal intellectual values that transcend subject matter divisions: clarity, accuracy, precision, consistency, relevance, sound evidence, good reasons, depth, breadth, and fairness. It entails the examination of those structures or elements of thought implicit in all reasoning: purpose, problem, or question-at-issue, assumptions, concepts, empirical grounding; reasoning leading to conclusions, implications and consequences, objections from alternative viewpoints, and frame of reference. Critical thinking in being responsive to variable subject matters, issues, and purposes is incorporated in a family of interwoven modes of thinking, among them: scientific thinking, mathematical thinking, historical thinking, anthropological thinking, economic thinking, moral thinking, and philosophical thinking (p.3).

Pardison (2000) mentions that critical thinking is "purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference as well as
explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based” (p. 120).

Meanwhile, McDade (1995) defines critical thinking as “the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by observation, experience, reflection, reasoning, or communication as a rubric to belief and action” (p. 10).

Also, critical thinking can be described as the scientific method applied by ordinary people to the ordinary world (Schafersman, 1991). This is true since critical thinking is aligned with the well-known method of scientific investigation: a question is posed and a hypothesis formulated, germane data are sought and collected, the hypothesis is further tested on the basis of the data, and conclusions are made at the end of the process. All the skills of scientific investigation map onto critical thinking abilities. So, critical thinking is scientific thinking.

2.2. Electronic learning (as the root of electronic homeworking)

According to Schank (2002), Roffe (2002), Sambrook (2003) and Tsai & Machado (2002) e-learning is “communication and learning activities through computers and networks (or via electronic means)”. More specifically, Fry (2000) defines e-learning as “delivery of training and education via networked interactivity and a range of other knowledge collection and distribution technologies.” Wild, Griggs and Downing (2002) also had the same definition as Fry’s – they defined e-learning as the creation and delivery of knowledge via online services in the form of information, communication, education and training. Bleimann (2004) mentioned that e-learning is a self-directed learning that is based on technology, especially web-based technology. He also stressed that e-learning is collaborative learning.

Internet and web technology is important in e-learning; Horton (2001) defines e-learning as “the use of Internet and digital technologies to create experience that educate fellow human beings.” Apart from web-based technology, e-learning seemed to require multimedia based courseware (Evans & Fan, 2002; Lahn, 2004. cited in Fahim et all. 2011). Therefore, it is clear that e-learning is centered on Information and Communication Technology (ICT). It is not surprising that Hamid (2002) and Lytras, Pouloudi and Poulymenakou (2002) mentioned that e-learning evolved around Information Technology to improve the learning performance and efficiency. Furthermore, Evans & Hasse (2001) pointed out that technology is indeed needed in e-learning to educate the learner through the usage of two-way video, two-way computer interaction, cable, satellite downlinks and Internet. Honey (2001) provided many good examples of learning activities that involved ICT. These examples include learning from e-mail, online research, online discussion and online homeworking. From these definitions and examples, we can therefore define e-learning as learning activities that involve computers, networks and multimedia technologies.

According to Ho Mei Lin (1997) language teachers are responsible to find effective ways to expand learners’ opportunities for better learning. He also states that when students become actively engaged in discovering information, they can solve problems and learn on their own which promotes autonomy in return. He also maintains that “Today, information technology (IT) effectively enhances independent learning in our classrooms and can be used as an integral part of classroom instruction” (p. 12).

The matter of being successful in learning a foreign language is determined by many factors. Hsia & Chuang (2002), Hsia & Hattersly (2004), Chang (2003), and Shih (1982) all agree that “theoretically, foreign language learners can learn a foreign language well so long as they are provided with a good language learning environment, plenty of study time, strong
motivation, effective teaching/learning methods and strategies, enough teaching materials, and a thoughtful teacher who recognizes learners’ needs” (as cited in Tseng-Chih Chang, et al, 2007, Para. 3).

The role of technology in second and foreign language teaching and learning has increased remarkably throughout the world over the past decade. These technologies, as Gill (2006) believes, include such elements as “the use of Power Point, email exchanges, web based activities, and synchronous and asynchronous communication (through the use of threaded discussion boards, live chat, and virtual communities)” (p. 19). Such a new environment can be incorporated to EFL/ESL classrooms to achieve more stimulating course materials, attempt more variety of learning styles, access more authentic materials on World Wide Web, and promote online communication in target language.

Also, According to some research done by the American Technology Evaluation Office (Wellburn, 1996), the technology should be one of the major factors for bridging over larger and larger gap between schools and society. Online environments and the use of the Web have been seen as an educational panacea for providing students with skills such as online communication, discussion and negotiation of meaning. The new technology helps the teacher with the educational process, presents new possibilities of creative work and two way communication, and furthermore presents teachers with a challenge to provide an active participation of all students. Browsers with interesting graphical designs, enable key word search for not only textual pages, but also search for pictures and sounds as well. Usage of e-mails also enables active participation in discussion lists where all participants can discuss, give their opinions or ask for help. Data transfer permits transmission of pictures, sounds, texts or programs needed for the classroom work. Electronic newspapers and search of distant libraries are also different and exciting ways of getting required information. Today, computer technology and Internet need to be seen as unavoidable teaching materials that provide students with new ways of communication, different ways to access the authentic materials, initiative to individual research and also to the individual and team work.

2.3. Electronic mail as an example of electronic homeworking

Electronic mail is a tool for communication on internet by personal computer, mobile phone or other devices. Content of e-mail presents through any kinds of form; message, picture, photo or video clip. Electronic mail is a method of exchanging digital messages. E-mail systems are based on a store-and-forward model in which e-mail computer server systems accept, forward, deliver and store messages on behalf of users, who only need to connect to the e-mail infrastructure, typically an e-mail server, with a network-enabled device for the duration of message submission or retrieval. An electronic mail message consists of two components, the message header, and the message body, which is the e-mail's content. The message header contains control information, including, minimally, an originator's email address and one or more recipient addresses (Wikipedia, 2010).

Effective ways of using e-mail in the classroom is the focus of the paper by Nagel (1999, p.87, cited in Fahim, Motallebzadeh, Sazegar, 2011) “E-mail in the virtual ESL/EFL Classroom.” It deals with more advanced issues connected with the use of e-mail in teaching, and especially with how to be most effective and to get optimal results in the use of e-mail as an instructional tool. This paper tries to achieve these goals by illustrating the difference between e-mail and academic writing, considering how e-mail functions as a learning tool, and whether to use a listserv or not. It also addresses a number of other problems painful for a wired classroom, trying to propose some workable solutions to them.

2.4. Research question and hypothesis

To achieve the goals of the present study, the following research question was posed:
Q. Does electronic homeworking have any significant effect on EFL learners’ critical thinking level?

To come up with reasonable results on the basis of the aforementioned research question, the following null hypothesis was proposed:

H0. Electronic homeworking has no significant effect on EFL learners’ critical thinking level.

3. Method

3.1. Participants

60 EFL college students of Birjand Higher Education Institute were chosen randomly as the participants of this study. They were divided into two groups, one experimental group (n=30) and one control group (n=30). Half of each group was male and the other half female.

3.2. Instrumentation

A questionnaire on critical thinking taken from Ashraf, H. (2011) was administered. Also, computer, internet, email, educational softwares, educational websites, etc. were used for entering electronic homeworking in teaching and learning process.

3.3. Procedure

First, a pretest on critical thinking was given to both groups. Then, the teacher of experimental group gave different tasks and assignments in electronic format to the students during 8 sessions. The tasks and assignments were chosen based on some features such as novelty and having thinking holes, attractiveness for forcing students to think critically, relativity to their background, activating students’ creativity, etc. For example, students were supposed to think critically and search for a specific topic and write a summary based on their own background and interpretation. At the end, a post-test was given to the students in both groups.

4. Results and Discussions

Having collected the results of answered questions of the questionnaire in the pretest, the researchers analyzed the data for critical thinking employing independent t-test. The purpose of this analysis was to estimate the participants’ critical thinking ability before the study began. Table 1 shows the results for this analysis.

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>t</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exp.</td>
<td>30</td>
<td>17.19</td>
<td>5.09</td>
<td>.473</td>
<td>60</td>
<td>.491</td>
</tr>
<tr>
<td>Cont.</td>
<td>30</td>
<td>16.37</td>
<td>5.14</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

As the results of Table 1 show, there is no statistically significant difference [t (60) = .473, p = .491] between experimental (M = 17.19, SD = 5.09) and control (M = 16.37, SD = 5.14) groups with regard to critical thinking ability which confirms the homogeneity of the participants at the outset of the study.

To investigate the effect of study treatment, the participants’ critical thinking ability was assessed in posttest via t-test analysis. Table 2 shows the results for this analysis.
Table 2: 
Results of t-test analysis for critical thinking skill (posttest)

<table>
<thead>
<tr>
<th>Groups</th>
<th>N</th>
<th>M</th>
<th>SD</th>
<th>T</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exp.</td>
<td>30</td>
<td>11.39</td>
<td>2.07</td>
<td>3.68</td>
<td>60</td>
<td>.00</td>
</tr>
<tr>
<td>Cont.</td>
<td>30</td>
<td>09.13</td>
<td>1.92</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As the results of Table 2 show, there is a statistically significant difference \([t(40) = 3.68, p = .00]\) between experimental \((M = 11.39, SD = 2.07)\) and control \((M = 09.13, SD = 1.92)\) group. This difference indicates that the participants in experimental group outperformed those in control group revealing the effect of electronic homeworking. Therefore, the null hypothesis stating that the utilization of electronic homeworking has no significant effect on EFL learners’ critical thinking skill is rejected.

5. Conclusions

As the findings of this study demonstrate, the technique of utilizing electronic homeworking can enhance the learners’ critical thinking skill. So, the findings of Brewer & Becker, 2010; Dufresne, Mestre, Hart, & Rath, 2002; Ogilve, 2000; Smolira, 2008, who found that online homework has better outcome results for students than traditional homework was proved in our study process. Also the findings of those who found that there is no difference in students’ performance with regard to electronic homeworking and critical thinking (Bonham, Deardorff, & Bechne, 2003; Cutshall, Mollick, & Bland, 2009; Demirci, 2007; Kodippili & Senaratne, 2008; Palocsay & Stevens, 2008) was rejected.

This study shows that critical thinking ability that plays an important role in the process of language teaching and learning can be improved by using new technologies. Also, Electronic homeworking was introduced and clarified as one of the aspects and branches of e-learning and distance education. Therefore, the psychological factors can be improved by new technologies. In addition, the role of emailing was examined as a tool in electronic homeworking.

Besides, the findings of this study may have some hints for English language teachers, educators and also the learners. It can be beneficial for teachers who are searching for effective ways of improving critical thinking skills. They can apply this technique for assignments and homeworking, and enhance the critical thinking ability of their learners. It is also helpful for learners who are seeking for cheap and available techniques of improving thinking ways. Therefore, we found and introduced one way for making critical thinkers in language teaching and learning process.

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