Critical Thinking Development in Foreign Language Teaching for Non-language-majoring Students

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Abstract

This paper deals with the problem of critical thinking development in EFL teaching. Having analyzed the definitions of critical thinking, Bloom’s taxonomy of pedagogical aims was chosen as a basis for the development of these skills. According to his chain “knowledge-comprehension-application-analysis-synthesis-evaluation” the block-schemes application while analyzing texts in the process of ESP teaching was selected. The results obtained by the students of the experimental group confirmed the hypothesis that using these block-schemes for working with texts allowed non-language-majoring students to understand the main ideas and to answer the questions more efficiently due to developing such skills as analyzing, synthesizing and evaluating the material.

Keywords: Critical thinking; Bloom’s taxonomy; block-scheme

1. Introduction

The development of education being the main strategic direction of educational system development, pedagogy the world over presupposes both the formation of critical thinking and the realization of learners’ creative potential, considering this as the priority of man’s intellectual development. In this connection the need for critical thinking development is extremely topical, but it does not find a corresponding implementation in teaching.

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The concept of critical thinking has some definitions in modern science. Russel (1999) understands critical thinking as the process of evaluation or categorization in terms of basic knowledge previously gained. American philosopher and teacher Dewey (2004) thinks that critical thinking arises when the learners begin to work at a concrete problem. Johnson (1985) defines critical thinking as a special kind of intellectual activity which allows a man to evaluate the point of view suggested to him or of a behavior pattern. Cluster (2001) considers critical thinking as independent thinking. In this case the information is a starting point but not a terminal one of critical thinking which begins with a question formulation and the problem clarification that must be solved. Critical thinking is bent on convincing argumentation; it is social thinking. Klarin (1995) suggests that critical thinking is rational reflexive thinking that is directed to solve the problem and to decide what actions should be taken. In this case critical thinking includes both skills and liability. Thus, the general position in all these definitions is that critical thinking can be considered as the skills to select the problem, to analyze the situation, to choose the corresponding actions for its rational solving, to evaluate the results. It is necessary now to choose the pedagogical technologies which are acceptable for using the transfer from simple acquisition of the material to its critical understanding, evaluating and new practicing sometimes being non-standard.

In EFL teaching, especially in ESP teaching, the work with professionally oriented texts is of special importance. The logic of these texts structure influences the process of their understanding. In this process the semantic subject and semantic predicate are distinguished. The process of understanding is assumed as a definite sequence of operations which can be methodically managed. The analysis of texts takes different forms depending on the objectives and tasks as well as the character of information, and it can be presented in the terms of different schemes, diagrams and tables. The aim of such analysis of the texts with the construction of a corresponding block-scheme is to keep the obtained information in mind with its following accurate representation (Millrood, 2001).

2. Research design and methodology

We consider the process of critical thinking learning on the basis of pedagogical objectives taxonomy which was developed by a group of American psychologists under the leadership of Bloom (1956). According to Bloom’s taxonomy, the educational objectives are divided into three spheres: cognitive, affective and psychomotor. The concept of taxonomy includes classification and systematization of the items situated gradually according to the rising complexity. So, the following chain can be presented: knowledge – comprehension – application – analysis – synthesis – evaluation. In modern consideration it has the view of the levels: remembering, understanding, applying, analyzing, evaluating, and creating (Anderson & Krathwohl, 2001). Namely these levels refer to critical thinking or thinking of a higher order. They can be realized while working with the text using block-schemes which contribute to its deeper understanding and more effective following representation of the information being analyzed.

After consideration of different variants of tables and schemes (presented in literature) we suggest the block-scheme presented in Figure 1.

![Figure 1. Block-scheme for analyzing texts](image-url)
2.1. Purposes and Objectives of Research

Our study is aimed at confirming the rising efficiency of textual information representation at ESP teaching through activation of thinking processes (classification, analysis, synthesis and evaluation) on the basis of the block-schemes construction.

2.2. Hypothesis

The hypothesis of our study is that in the teaching process we realize the model of text understanding with the help of block schemes which are constructed with account of Bloom’s taxonomy, and the use of them leads to the rising efficiency of the learning process due to the development critical thinking of learners.

The understanding of any text has some phases: identification, assimilation and accommodation. Identification is a process of comparison the information developed in the text with the knowledge the learners have already gained. Assimilation is thought as the acquisition of some parts of the text which are the most important. Accommodation is considered as the application of new knowledge taken out of the text to a new situation. The processes mentioned above are inherent for learners’ critical thinking in the process of text perception. And in these phases the chain of Bloom’s taxonomy is realized:

- Knowledge. The acquisition of professional term system while reading the text and making active vocabulary before the block-schemes construction.
- Comprehension. It implies the work with authentic texts of professional interest and the process of this material information value understanding. On the basis of work with professional terms in English we can start to discuss texts and to form the basic skills which are necessary for critical thinking development.
- Application. The formulation of the basic questions developed in the text, classification of the problems and these results using while representing and discussing the text are implied on this stage.
- Analysis. The main ideas of the text are classified and the block-schemes are constructed.
- Synthesis. Having analyzed the material presented in the text, the students should express their opinion, grounded it on the valid arguments. At this stage the learners must demonstrate their skills to establish cause-and-effect relations, to compare different points of view, to agree or disagree with some of them and to formulate their own argumentative conclusions.
- Evaluation. At this stage after discussion the students have a possibility to evaluate their participation in the course of work with the text. It allows revealing the reflexive correction of students’ activity for the future learning.

2.3. Sample group and content

The experiment was carried out in groups of students (62 participants) who studied at the Institute of Biology at National Research Tomsk State University. The experimental group (EG) consisted of 32 students, and in the control group (CG) there were 30 students. In class activities the texts of special interest for these students were used, and they were connected with the problems in ecology, zoology, genetics and morphology of plants.

2.4. Methods of research

In order to confirm the hypothesis and reach the objectives of the study we used the following methods and research tools: systematic observation; knowledge test; psycho-pedagogical experiment; and in order to interpret the results, we used mathematical-statistic methods (T-criterion of Student). We made a conclusion after the experiment about the following correlations: between using block-schemes for text analysis and efficiency of learning; between understanding the main ideas of the text, their classification and analysis and the improvement of text representation; between using block-schemes and making easier the understanding of the problems being discussed. In the organization of class activities we systematically used block-schemes to activate mental abilities of students.
through such activities as classification, analysis and representation of the information having professional interest for learners.

3. Results

For the control over the students’ activity in their work with the text according to the realization of Bloom’s taxonomy parameters with the help of block-schemes construction, we made 6 pretests and post-tests which were taken from the system of TOEFL. These tests included the tasks for the texts reading and comprehension, which were realized through multiple choice tests (20 questions and statements) for each text. The experimental teaching was carried out during two terms (8 months). The results are presented in Table 1.

Table 1. A number of correct answers (average value) of pretest and post-test activities of students.

| Sample students | 1 pretest/post-test | 2 pretest/post-test | 3 pretest/post-test | 4 pretest/post-test | 5 pretest/post-test | 6 pretest/post-test | Total average value, pretest/post-test |
|-----------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|--------------------------------------|
| Experimental group | 5.89/14.85          | 5.11/14.32          | 5.32/13.57          | 5.39/13.42          | 5.93/14.42          | 6.71/14.04          | 5.73/14.10                           |
| Control group   | 5.68/10.14          | 5.18/10.10          | 5.18/10.50          | 5.77/10.00          | 5.41/9.86           | 6.68/10.60          | 5.65/10.17                           |

The students of both experimental and control groups showed an approximately similar level of the text comprehension while making pretest at the initial stage of the experiment. It confirmed the similar skills of students in EG and CG for working with texts. After implementation of block-schemes for the information of professionally oriented texts analysis and then the synthesis and representation of this information in class activities using the block-schemes, the students of EG revealed better results in comparison with those shown by the students of CG. The comparative parameters are presented in Table 2.

Table 2. Comparison of results obtained in experimental and control groups of students.

| Sample students | Average value of correct answers (pretest) | Average value of correct answers (post-test) | Deviation | Value of T-criterion (Student’s) |
|-----------------|--------------------------------------------|---------------------------------------------|-----------|---------------------------------|
| Experimental group | 5.73                                       | 14.10                                       | 8.37      | 6.59*                           |
| Control group   | 5.65                                       | 10.17                                       | 4.52      |                                 |

* For the chosen significance level of $\alpha=0.01$ T-criterion equals to 2.66. The calculated value $t=6.59>2.66$ and it speaks of the relevance in the average values difference.

The value of T-criterion gives evidence of the relevance in difference and of the obtained results validity. It confirms our hypothesis that the block-schemes application while analyzing the professionally oriented texts allows increasing the efficiency of teaching due to the development of students’ skills to analyze, classify and then to synthesize the textual material. The students of EG who worked with texts on the basis of block-schemes application, showed higher results while making control tests because, in our opinion, the realization of the text comprehension model was realized at the stages which correspond to Bloom’s taxonomy: knowledge – comprehension – application – analysis – synthesis – evaluation. This fact allowed students to represent the information systematically, with reliance on distinguished main ideas of the text, to represent argumentatively the reports according to the problems of the text. These results well agree with those obtained while investigating the optimization of learning through cognitive maps as a cognitive-constructivist and social constructivist learning tool. The use of these maps also develops the skills of students to synthesize structure and schematize a scientific content.
of the text and the results show the efficiency of acting means and tools proposed in the students’ learning activity (Mogonea & Mogonea, 2014).

4. Conclusion

Thus, the study was aimed at confirming the efficiency of learners’ critical thinking activation and development while working with professionally oriented English texts in the process of ESP teaching. The application of block-schemes based on Bloom’s taxonomy allows promoting and elaborating such skills of students as analysis and classification of information, systematization of the material, synthesis of the ideas and evaluation of the obtained information.

The results of text comprehension registered by the students of the experimental group were improved after the implementation of block-schemes in class activity. The difference of the results from post-test in comparison with the pre-test was statistically significant. The results confirmed the hypothesis of the investigation and allowed the development of some new aspects for future research concerning the questions of group discussion organization and collaborative work of students on the basis of block-schemes application while analyzing the texts having professional interests for non-language-majoring students. This method will improve not only foreign language acquisition but contribute to the formation of professional competence through the development of learners’ critical thinking.

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