Developing Critical Thinking through Cooperative Learning

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Abstract. To think critically means to function effectively in the changing world of the 21st century. Thus, only conscious learning and reasonably active teaching with the focus on critical thinking skills might help a learner achieve positive results in any field, foreign languages included. The problem is that the basic intellectual standards essential to critical thinking are not typically taught in schools. Therefore young people at the university frequently display poor reasoning and problem-solving skills. This fact encouraged the authors of this study to analyse the development of critical thinking in university environment while teaching Business English (BE). The research methodology has been based on humanistic philosophy and cognitive theory related to a constructivism principle which recognizes teaching as an active process. The study presents both theoretical and practical considerations of the development of critical thinking. The focus is on Cooperative Learning (CL) activities that appeared to be effective techniques for developing critical thinking. The article analyses the most successful CL structures being applied in the foreign language classroom disclosing their content and effect on critical thinking skills. The classroom research carried out at the Lithuanian University of Agriculture confirms that CL creates favourable conditions for learners to become critical thinkers.

Key words: critical thinking, cooperative learning, university environment, Business English, assessment.

Introduction

Over the last forty decades critical thinking was not an objective in education.

In many European countries school system, the syllabus offers critical thinking as a subject which 16-18 year olds can take. The exam tests candidates not on particular information they have learned during the course, but on their ability to think critically about, and analyse arguments on their deductive (relating to, or provable by deduction) or inductive validity. The subject is very challenging and extremely useful for degree courses in politics, philosophy, and history providing the skills required for critical analysis.

If to compare with the Western countries, which have more practice in the development of critical thinking, the situation in Lithuania is completely different. Learners are not encouraged to improve themselves as thinkers. Emphasis is placed on information transmission. However, accent on memory, practice, rote learning and little focus on higher-order thinking has negative effect on the quality of teaching/ learning. The majority of school leavers, who are being fed with finished statements, are not able to think rationally: they can't consider the problem from different perspectives, back arguments with evidence and reference to consequences, formulate their own conclusions, defend their assertions with reasons.

Actually, parents, and the professional public are greatly concerned that young people at secondary schools fail to acquire the necessary skills and knowledge to meet the real life challenges and benefit from a world which offers enormous opportunities. Employers are also very critical about young people's readiness to join the labour market. They consider that many of the employees do not possess the knowledge and skills to be competitive in a rapidly changing world. This confirms that traditional educational strategies based on passive learner role and work with information by learning it by heart fail to meet the changed society needs and, therefore, have to be replaced by problem based, meaningful activities where a learner is placed in the centre of educational processes. According to some authors from abroad (Arends 1998; Barnett 1997; Lipman 1991; Paul 1993; Resnick 1987; Siegel 1980), the curricula of educational institutions should provide special system to develop the ability to think critically. In their scientific publications Lithuanian scholars (Butkienė, Laurinčiukienė 1997; Jucevičienė 1997; Stulpinas 1993; Šiugždinienė 1997; Visockienė 2001) also have outlined the importance to develop critical thinking in contemporary educational systems.

Critical thinking is an essential constituent of the academic world generally because this is the main way that knowledge is added to a field. Critical thinking is a desirable skill in all aspects of university work because it allows knowledge and skills to develop and evolve. It is necessary in students' reading, note making, assignment writing, tutorial presentations and professional practice.

Therefore, under present circumstances, the development of critical thinking becomes a promising strategy helping to increase learning effectiveness while teaching any subject matter, included foreign languages.

Novelty of the planned research relies on the fact that critical thinking skills were already in place in the Science education whereas its relationship with foreign language teaching/ learning, the impact of cooperative learning and influence on language improvement were not amply researched.

The research aim: to reveal the significance of CL activities while developing critical thinking during BE classes.

The research object: the process of teaching the BE course at the level of bachelor studies.

The research objectives: to analyse literature related to critical thinking, to categorise the elements and kinds of

critical thinking, to assess students' critical thinking skills, to present the most successful CL structures that can be used to develop critical thinking.

The research methodology: the present study refers to the following methodological attitudes:

- Humanistic philosophy and theory of personality based on a principal that a human being is unique and integral. This theory emphasises the development of individual's natural abilities.

- Cognitive theory related to a constructivism principal, i.e. teaching is understood as an active process. Its purpose is not only to give and receive information, but also to stimulate students' thinking and activity.

The research methods: the analysis of scientific literature, questionnaire, observation, statistical and comparative analysis.

Theoretical Background

The roots of critical thinking are as ancient as its etymology, tracing to the times of Socrates who paved the way for the tradition of critical thinking.

Critical thinking as a specific area of study goes back at least to 1941 with Edward Glaser's "An Experiment in the Development of Critical Thinking".

The development of thinking was strongly influenced by the work of certain leading individuals as Benjamin Bloom. Following the 1948 Convention of the American Psychological Association, Benjamin Bloom took a lead in formulating a classification of "the goals of the educational process". Bloom headed a group of educational psychologists who developed a classification of levels of intellectual behaviour important in learning. This became a taxonomy including three overlapping domains; the cognitive, psychomotor, and affective (Bloom, Krathwhol 1956; Anderson, Krathwohl 2001).

The work of Bloom and others on taxonomies was extremely significant as it was the first attempt to classify learning behaviours and provide concrete measures for identifying different levels of learning. The development of taxonomies is closely related to the use of instructional objectives and the systematic design of instructional programmes.

Many definitions are cognitively correlated to Bloom's taxonomy, the assumption being that critical thinking is inherent in the higher-level thinking skills of analysis and synthesis. Bloom categorised thinking into the following six processes:

Knowledge – to know means to have a fact or information at one's disposal;

Comprehension – to comprehend a fact or a piece of information is to understand what it means;

Application – to apply information means to find some practical use for it;

Analysis – to analyse means to break information down into parts and see how these parts work together;

Synthesis – to synthesise means to take the knowledge one has and connect it with other knowledge;

Evaluation – to evaluate means to be able to judge if information is good or bad, sound or unsound.

Despite the fact that Bloom's taxonomy has not held up well in empirical testing and is being discarded by many educators (Tucker 1996), many researchers use an approach based on his works. Bloom's model was taken into account while organising the present classroom research.

Browne and Keeley (1986) refer to critical thinking as filtering, separating the relevant from the irrelevant. Chaffee (1985) says that critical thinking is "making sense of our world by carefully examining our thinking and the thinking of others in order to clarify and improve our understanding". Others (Beardsley 1975; Missimer 1990; Kahane 1992; Freeman, 1993) define critical thinking much more technically: understanding argument, recognizing fallacies, distinguishing premises from conclusions, and isolating salient issues from non-relevant information.

Brookfield (1986), long considered an "expert" on critical thinking, contends that critical thinking is a process. Although his definition includes emotional as well as rational components, and clearly acknowledges the importance of culture and context, it contains the following common characteristics:

- Identifying and challenging assumptions.

- Challenging the importance of context.

- Trying to imagine and explore alternatives.

- Reflective scepticism.

Brookfield (1986) defines reflective scepticism as the act of constantly questioning the status quo. Just because something has been believed for years does not necessarily mean that it is true. Just because something has been done a certain way for years does not mean it is the only or best way to do it. Furthermore, just because someone of perceived importance says something is right, that does not prove to be right.

Paul, Binker, Jensen, and Kreklau (1990) have developed a list of 35 dimensions of critical thought. Their "Critical Thinking Handbook" is a guide for remodelling lesson plans in language, arts, social studies and science.

The pioneering work of Lipman, as well as other leading figures such as Edward de Bono (1970, 1976, 1992), have inspired a wide range of work. Nickerson, Perkins and Smith (1985) listed thirty different programmes. Since then, many works have appeared. Some approaches to 'teaching thinking' (Sternberg and Berg 1992) have attempted to look at this extensive range of programmes and their underpinning theories and classroom techniques and determined the key elements, to identify techniques which can be more easily adopted by practitioners. A wide range of programmes are now available to researchers, such as "Thinking Actively in a Social Context" (Wallace and Adams 1993) developed to promote problem-solving with a cycle or activating children's thinking skills drawing on the works of Schwartz and Parks (1994) and McGuinness (1999). These resulting approaches are hard to classify though elements from the other approaches can be seen. Of

particular note is the work of Michael Shayer and Philip Adey (1994) at Kings College in London. Most programmes and approaches acknowledge the importance of language, articulation and discussion as a key element in "Thinking Together" (Dawes 2000). The influence of Robert Fisher (1987, 1990, 1995) in developing classroom resources to develop a 'community of enquiry' is particularly significant, as is the work of Karin Murris (1999) and the Society for the Advancement of Philosophical Enquiry in Education.

S. Ferrett (1997) in "Peak Performance" advances the following characteristics of critical thinker:

1. Asks pertinent questions

2. Assesses statements and arguments

3. Is able to admit a lack of understanding or information

4. Has a sense of curiosity

5. Is interested in finding new solutions

6. Is able to clearly define a set of criteria for analysing ideas

7. Is willing to examine beliefs, assumptions, and opinions, and weigh them against facts

8. Listens carefully to others and is able to give feedback

9. Sees that critical thinking is a lifelong process of self-assessment

10. Looks for evidence to support assumptions and beliefs

11. Is able to adjust opinions when new facts are found

12. Looks for proof

13. Examines problems closely

14. Is able to reject information that is incorrect or irrelevant

Joe Old, in an October 15, 1998 online article entitled "What Is Critical Thinking?" recommends that all college students learn to practice 14 activities. His list is compiled from multiple sources on the topic of critical thinking.

1. prioritise things
2. identify purpose in things they read
3. determine consequences
4. determine effects
5. identify bias
6. identify assumptions
7. draw conclusions
8. make contrasts and comparisons
9. do syntheses
10. develop hypotheses (and test them)
11. use figurative language
12. make critiques
13. make summaries
14. make evaluations

In their scientific publications Lithuanian scholars focus on different aspects of the critical thinking concept.

T. Stulpinas (1993) analyses some structural elements of critical, reflective thinking. The research of V. Valatkaitė-Rimienė (1998) suggests that a large majority of students is not able to think critically. P. Jucevičienė (1999) outlines the problems of the development of critical thinking and

research skills. V. Gudžinskienė (2000, 2006) emphasises the importance of collaboration between the educator and the student in the process of development of critical thinking skills.

O. Visockienė (2001) elaborates on the causes of change in education and considers fostering critical thinking to be a major factor in the context of contemporary educational change.

The focus of classroom research carried out in the spring of 2004 was on 7 components of critical thinking, which were chosen with reference to the works of B. Bloom and D. Krathwhol (1956), S. Ferrett (1997) and J. Old (1998)

The divergent ways of conceptualising critical thinking can be attributed to the fact that a vast number of definitions of critical thinking have appeared in the educational research literature. The existing definitions of critical thinking can be represented on a scale starting with its wider interpretation which includes both subjective and objective aspects i.e. the domain of action as well as the domain of thoughts (Barnett 1997) and ending with a narrower definition which looks upon critical thinking as the ability of thinking (Elder and Paul 1994). Between these extreme positions, some other definitions involving various aspects of critical thinking can be found, as the following list indicates:

"the thinking which includes self-reflection and critical action"	(Barnett 1997)
"a skill of thinking as well as a personal attribute"	(Facione 1995)
"a process based on reason, intellectual honesty, and open-mindedness"	(Kurland 1995)
"the development of cohesive and logical reasoning patterns"	(Stahl and Stahl 1991)
"the directed thinking that focuses on a desired outcome"	(Halpern 1996)
"the questioning or inquiry while seeking to understand, evaluate, or resolve"	(Maiorana 1992)
"the examination and testing of suggested solutions"	(Lindzey and Hall 1978)
"a rational decision what to or what not to believe"	(Norris 1985)
"the ability to take charge of one's own thinking"	(Elder and Paul 1994)
"an attitude of being disposed to consider in a thoughtful way the problems and subjects that come within the range of one's experiences".	(Glaser 1941).

The variety of ways in which critical thinking is conceptualised gives rise to different interpretations as far as its key elements (abilities, knowledge, skills, processes, values, attitudes) are concerned. It is important to notice that none of these definitions capture the same combinations of critical thought elements. While the knowledge base required for critical reflection varies from subject to subject, the underlying values and attitudes remain constant across school subjects. Although skills and processes are somewhat

dependent upon specific subject matter, the same values and attitudes are required in all subjects for their execution. Therefore it is very important to evaluate the above mentioned elements while incorporating critical thinking into the teaching.

To sum up, the result of the collective contribution of the critical thought is that it became possible to question:

- ends and objectives

- the wording of questions

- the sources of information and fact

- the method and quality of information

- the mode of judgment and reasoning used

- the concepts that make the reasoning possible

- the assumptions that underlie concepts in use

- the implications that follow from their use

- the point of view or frame of reference within which reasoning takes place.

The latter fundamentals of thought and reasoning constitute a baseline in critical thinking. In the light of the above analysis, a working definition of critical thinking has been designed:

> "Critical thinking is thinking that focuses on ability to identify, question, criticise, analyse, develop own decision and back arguments, make decision, summarise and communicate issues effectively".

Classroom Research: The Development of Critical Thinking

The research aimed to reveal the significance of CL activities while developing critical thinking during BE classes. The investigation was conducted in the spring of 2004. The research involved 90 second-year students of the faculty of Economics and Management who had BE as compulsory subject and three English language instructors. The students had 3 hours a week and stayed together as groups for 4 months.

The teachers who took part in the experiment had to follow practical step by step guidelines for integrating cooperative learning techniques into their instructional and evaluative methods. Step one was to use uncomplicated structures of CL (Appendix, Table 1) and only after a successful mastering of the techniques teachers were encouraged to use more complicated CL activities (Appendix, Table 2). Accordingly, not only essential cooperative learning strategies (setting the tasks, reminding the students of the principles of cooperation, monitoring the process, giving assistance/ feedback, maintaining a standard of accountability) were used, but also more complicated CL techniques were applied. Cooperative learning was applied because it is an especially effective method to be used with any problem-solving task. The students got plenty of opportunities to brainstorm ideas, to express divergent points of view, to implement and to evaluate the solutions at the same time helping them become better listeners, speakers, readers, and writers. These CL structures had the determined influence on the development of critical thinking.

90 students of Economics and Management faculty where chosen to participate in the project because considerable fluency in English was required. Students of Economics and Management faculty are better equipped with the knowledge of English. The primary reason for showing better results than students of other faculties is better quality of teaching that they had got at school, as bigger part of them come from cities, whereas students of other faculties (Agronomy, Forestry, Engineering) come from remote rural regions. These students confront many obstacles in their pursuit of higher education-including difficulties in foreign languages.

The skills of critical thinking and the knowledge of English were evaluated on the basis of cooperative case-study tasks and written summaries ("Choosing the right person for the job", "How to hit the market").

Students were given a scenario and asked to find a plausible solution. Feedback was provided on a group basis when students selected materials, discussed issues and prepared drafts. The focus areas for assessing critical thinking skills were 7 components of critical thinking, which were chosen with reference to the works of B. Bloom and D. Krathwhol (1956), S. Ferrett (1997) and J. Old (1998) and having the closest relation with the use of language:

1. ability to identify and state issues clearly, logically and accurately

2. ability to ask pertinent questions

3. ability to develop own position and back arguments

4. ability to make summaries, identify relevant points of view

5. ability to analyse, do synthesis and make decisions

6. ability to make critiques and integrate other perspectives

7. ability to use explicit language, communicate effectively

Each of the seven criteria was assessed by a numeric score from 1 to 3, where a score of 1 represents no evidence of the skills, 2 demonstrates adequate skills, 3 represents competency.

After 4 months of focused and persistent effort students were reassessed to compare their performance with the no-intervention performance and all the participants were surveyed after the pedagogical strategies used. Unanimously, all the surveyed students felt that they met their expectations for critical thinking.

Creative thinking was incorporated into the development of critical thinking through CL activities. The reason for that lies in the fact that almost all of the thinking which we undertake contains some critical and creative aspects. Creative thinking is generally considered to be involved with the creation or generation of ideas, processes, and experiences, whereas critical thinking is concerned with their evaluation. Therefore critical and creative thinking, as interrelated and complementary aspects of good thinking processes, should be developed together (Chubinski 1996; Klenz 1987). The attempt was made to involve the target students in various critical and creative thinking activities

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by using cooperative learning structures (Appendix, Table 1 and Table 2).
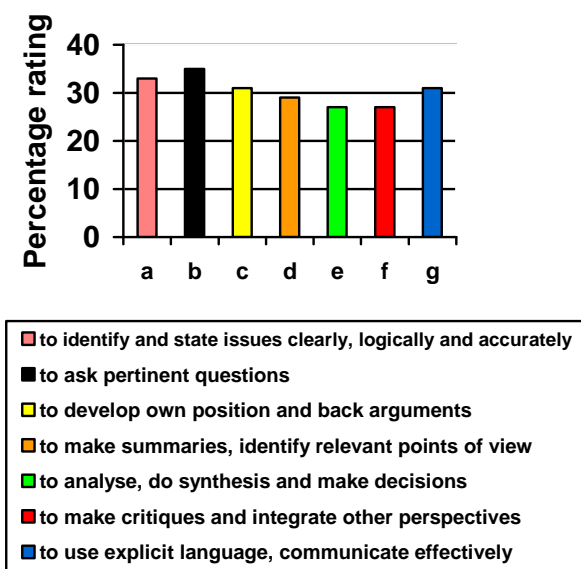
Classroom Research: Results and Discussion

Figure 1. Preliminary Assessment of Critical Thinking (percentage rating)

The analysis of the no-intervention performance (Figure 1) showed that the majority of the students did not understand the basic nature of critical thinking and in a lot of cases failed to display critical thinking skills. The data of the preliminary assessment (Figure 1) confirmed that 30 students (33%) had no difficulties in identifying and formulating statements with clarity, accuracy, precision or relevance to the question at issue. Only 32 students (35%) were good at asking questions. A lot of the students found it difficult to ask questions that probe assumptions, reasons, evidence, and implications. 28 students (31%) could develop their own positions and possessed argumentation and interpretation skills.

24 students (27%) succeeded in analysing, making decisions and solving problems. 26 students (29%) demonstrated skills in summarising, identifying relevant points.27% of participants could make critique integrating other perspectives and 31% of students could communicate effectively using explicit language.

The analysis of the data showed that only about one - third of the students displayed sufficient reasoning skills and could take charge of their own ideas, assumptions, inferences, and intellectual processes.

The final presentations and summaries (Figure 2) received significantly higher rating in comparison with the rating of preliminary assessment. A systematic employment of critical thinking into the classroom activities through CL structures at the same time paying great attention to creative aspect of thinking helped the students improve their critical thinking skills.
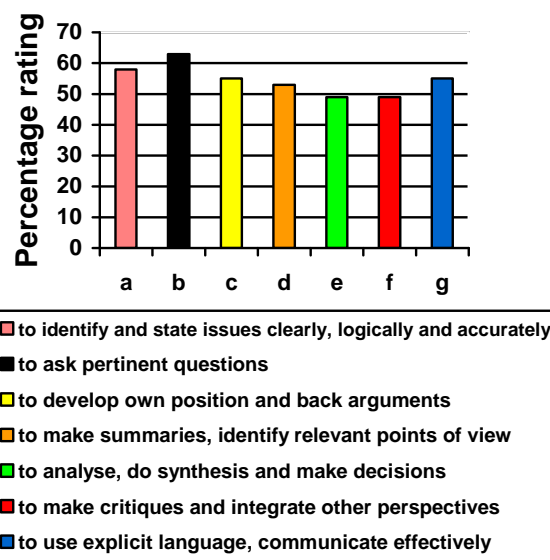

Figure 2. Final Assessment of Critical Thinking (percentage rating)

The final assessment (Figure 2) shows that 53 students (58%) succeeded in expressing statements clearly, logically and accurately. 57 students (63%) were able to ask pertinent questions. 50 students (55%) acquired argumentation and improved communication skills. 48 students (53%) could identify relevant points of view and write effective summaries. 44 students (49%) were capable of analysing, making critiques. The results of the experiment are rather optimistic: 57 students (63%) improved their questioning skills. This fact is very promising, for questions are the force that powers thinking, that is, they define the agenda of everybody's thinking and, therefore, are a critical part of any critical reflection.

The research has revealed that the students became better in making critique, developing own position and making decision because both critical and creative thinking have been applied in the process of teaching. One has to agree that, first, one must analyse the problem, then one must generate possible solutions, next one must choose and implement the best solution, and finally, one must evaluate the effectiveness of the solution. This proves that the two kinds of thinking, critical and creative, operate together much of the time and are vital to problem solving.

Conclusion

The classroom research has revealed the relationship between cooperative learning and critical thinking. Students who mastered the skills of cooperative learning they mastered the skills of critical thinking as well. The relationship between students' success in mastering critical thinking and good language command has become evident as well.

It has been proved that critical and creative thinking are interrelated and complementary aspects of thinking. Therefore, it is important to pay attention to the development of both critical and creative thinking in order to improve critical thinking skills.

It is important for educators to recognize and assess components of critical thinking. Because it is difficult to compare students' performances using different grading systems, the assessment of 7 components of critical thinking can facilitate the process. As critical thinking requires the thinker to identify, analyse, criticise, question, evaluate, summarise and communicate effectively, it would be reasonable to incorporate the assessment of 7 components of critical thinking into the final assessment of written works and long-term cooperative tasks. In fact, the success depends directly on the competence of graders and the manner in which they establish consistency in their grading.

CL is a valuable tool for developing critical thinking, for it creates the most desirable classroom environment where the learners experience psychological safety, intellectual freedom, and respect for one another as persons of worth.

CL structures contribute to the development of critical thinking if the right strategy is chosen. It was determined that a correct strategy while developing critical thinking should include:

- interpersonal contact: to put different learners together

- creating mutual interdependence and common aim. There should not be too strong competition between team members. They have to take care to create conditions for interdependence and not for too individual work, that is, a good group climate should be realised

- equal status among members. A different role exists only in the leader status, but the leader of a team should have only a limited power. He/ she should be more a coordinator than a 'boss'

- a teacher should perform the role of a consultant offering the students a strong support to seek imaginative, constructive, ethical solutions to problems.

Critical thinking assignments don't need to cover all outcomes at one time but they can vary throughout the course. It is necessary to modify old and create new assignments that use critical thinking criteria.

The participants' (teachers') gained practice will facilitate other teachers of language putting more emphasis on thinking critically within their instructional and evaluative methods.

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Kritinio mąstymo ugdymas kooperuotu mokymu

Santrauka

Sovietiniais metais, kai buvo pripažįstama tik viena ideologija, kritiniam mąstymui ugdyti nebuvo sąlygų. Tačiau spartūs šiuolaikinio pasaulio pasikeitimai bei kylančių problemų sudėtingumas reikalauja ne tik žinių, bet ir gebėjimo kritiškai mąstyti. Todėl švietimo įstaigos turi rūpintis ne tik informacijos perdavimu, bet ir ugdyti kritinį mąstymą. Taigi kritinio mąstymo ugdymas esamomis sąlygomis tampa būtinybe bet kokio dalyko, taip pat ir užsienio kalbų, mokymo(si).

Tyrimo tikslas: įrodyti kooperuoto mokymo(si) efektyvumą ugdant kritinį mąstymą, mokantis verslo anglų kalbos. Tyrimo uždaviniai: atlikti kritinio mąstymo literatūros analizę, išnagrinėti kritinio mąstymo elementus ir rūšis bei aptarti efektyviausias kooperuoto mokymo(si) struktūras, kurių taikymas padėtų studentams išsiugdyti kritinio mąstymo įgūdžius

Tyrimo rezultatai rodo, kad:

1. ugdant kritinį mąstymą, tikslinga ugdyti ir kūrybinį mąstymą, nes tai yra glaudžiai tarpusavyje susiję ir vienas kitą papildantys kokybiško mąstymo procesai (kūrybinis mąstymas lemia idėjų, procesų, patirties generavimą, o kritinis – jų vertinimą).

2. Kooperuotas mokymas yra efektyvi kritinio mąstymo ugdymo priemonė, nes padeda sukurti palankią psichologinę ir intelektualinę mokymosi aplinką, kurioje komandos nariai vertinami kaip asmenybės.

3. Kooperuoto mokymo efektyvumą, ugdant kritinį mąstymą, lemia tinkamai parinkta mokymosi strategija. Tai strategija, kuria vadovaujantis, tikslingai plėtojamas narių bendradarbiavimas tam, kad jie padėtų vienas kitam ir gerbtų vienas kitą;
   - sukuriama abipusė priklausomybė, pagrįsta ne konkurencija, o bendradarbiavimu siekiant bendro tikslo;
   - kolektyvo nariams užtikrinamas vienodas statusas, net komandos lyderiui skiriamas ne „boso', o koordinatoriaus vaidmuo;
   - skatinama dėstytojo konsultanto ir studento partnerystė, pagrįsta vertybėmis (laisve, racionalumu, kompetencija, autonomija) ir žmogiškosiomis nuostatomis.

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APPENDIX

Table 1. The Most Efective, Uncomplicated CL Structures for the Development of Critical Thinking (Step 1)

CL Technique	Description	Effect	Developer
Grid "agree, disagree, question, obtain new information	The students had to follow the team presentations. Then they were required to fill in the grid that consisted of four parts, marking in the information with which they agreed, disagreed, which was new to them and what they would like to ask. The information had to be grouped and formed in clear statements and questions. After that all the teams had to introduce the information, presenting their own assessments.	• to focus on what was most significant; • to form opinions; • to create arguments; • to make meaningful and useful applications of the gathered information; • to evaluate the received information in order to provide logical and creative statements.	LUA lecturers 2003
Word chains	The students had to think of 10 words where the last letter of the word would be the beginning of the following one. The teams had to create a paragraph, employing all the words. The paragraphs were read aloud and the teams were asked to select the best one. Finally, the students had to prove why they selected one or another paragraph as the best.	• to form and to back arguments; • to defend their points of view with reasons; • to recognize contradictions; • to use the information in a creative and critical way in order to be as original as possible.	LUA lecturers 2003
Damaged text	The students were presented with the same piece of the text that had been cut in different shapes. The teams were asked to get acquainted with it. Then the teams had to guess the part of the text that had been cut off.	• to analyse the problem; • to generate possible solutions; • to choose and to implement the best solution; • to take into account the multiple choices; • to defend their assertions with reason.	LUA lecturers 2003

Table 2. The Most Effective, Complicated CL Structures for the Development of Critical Thinking (Step 2)

CL Technique	Description	Effect	Developer
Think-Pair-Share	The students thought to themselves for ten-fifteen seconds about the topic being presented. Then they paired with another student, already designated by the teacher, to discuss the topic. The pair then shared their thoughts with the entire class.	• to work with facts • to reason more carefully • to accept other opinion • to challenge their own ideas	Augustine, Gruber and Hanson 1989/1990.
Number Heads Together	The students were assigned numbers for two weeks or more. Depending on the number of the students in the group, the teacher assigned numbers up to three, four, or five. The teacher presented a question/problem. The students discussed and reviewed it with each other of the same number to make sure that everyone knew the answer. The teacher then called out one of the assigned numbers. All the students with this number stood and one of them was asked to give the answer.	• to consider the problems and to try to come up with a solution • to present the logical argument • to communicate clearly, logically, and accurately	Augustine, Gruber and Hanson 1989/1990.
Group Investigation	The members of the team planned how they would research the topic/problem and who would be assigned what work to do. Cooperative teams were formed according to common interests in a topic. Then the team came together to summarize findings and make a class presentation.	• to brainstorm the answers to various dilemmas • to solve problems and conflicts • to make decisions	Sharan 1980. Sharan and Sharan 1989/1990.
Value Lines	At first the students worked individually and then in pairs they clarified their own values and experienced diverse points of view.	• to analyze the problem • to make important critical choices • to evaluate the effectiveness of the solution • to recognize contradictions	Kagan 1992.
Jigsaw	The students were divided into the teams (usually four), with each member being given a different segment of the assigned material. Each team member was given time to get acquainted with the material. Then the members of the team joined another team in which the students had the same assignments in order to learn the material and become the team expert. After this was completed, each student returned to his/her original team to fullfill the responsibility of presenting his/her material to the rest of his/her group.	• to observe objectively and thoroughly • to accept different view points • to present facts in a clear and precise form • to infer and assume carefully	Johns Hopkins Center
Teams-Games-Tournamets	The team consisted of three members. Students, who won, advance to tougher competition each week. Points were awarded to teams through winning. Therefore high achieving teams competed against high achieving ones while low achievers competed against low achievers allowing an equal chance to succeed.	• to brainstorm ideas • to provide a wider variety of perspectives on the matter • to defend one's assertions with reason • to choose and implement the best solution.	Slavin, 1991.