

ASSESSING STUDENTS' CRITICAL THINKING SKILLS AT HIGHER EDUCATION IN SLOVAKIA

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Abstract

The critical thinking is a fundamental set of skills which is crucial to be developed throughout the education system. In Slovakia despite the general interest to develop the critical thinking among the students, the number of country surveys showed the unsatisfactory scores reflecting the level of critical thinking among university students. In this paper the development of the critical thinking skills' assessment method is presented. The process of assessing critical thinking skills among students at higher education was built upon the pretest and posttest approach. The construction of critical thinking parameters/standards for teaching and learning were implemented in our research methodology to reflect the several critical thinking skills, for instance: structural and text analyses, skill of debating, ability to reflect own biases and problem – solving skills. To provide explicit measurements of the proposed standards as well as performing a feedback process the combination of the quantitative and qualitative method have been used. Critical Reflection Analysis (CRA) with exact measures and qualitative description of each standard is the assessment tool that support continuous learning and improvement of the critical thinking skills.

Key words: critical thinking, assessment, higher education, Critical Reflection Analysis

JEL Kód: M21, O15, I23, J24

Introduction

Critical thinking (CT) is one of the key competences of a university educated person. The results of the international test reviews (PISA, TIMSS) were not satisfactory for Slovakia. Students have difficulty to identify the suitability of different sources, assess their credibility, and then formulate their own conclusions as well as justify their opinion. Questionnaire survey conducted by consulting company INEKO (2017) in cooperation with the Business Alliance of Slovakia, of selected 81 public figures (activists, non - profit organizations., entrepreneurs, economic analysts, academics, journalists, officials, and politicians) highlighted a

strong necessity to reform the content of education and educate teachers to develop critical thinking.

Instead of learning by self-discovery, teachers often practice dictation - but this does not lead to self-reliance and critical thinking, rather to memorization and automatic acceptance of opinions, without argumentation, discussion, and self-evaluation.

The poorly set up system of education in Slovakia is confirmed by a study prepared for the Ministry of Education of the Slovak Republic, which states that pupils and students are not well prepared for the current societal and global demands. They have difficulty working independently, discussing, thinking, formulating their own opinion, and taking responsibility for their actions (Vančo et al, 2016). All the above missing skills are embedded in the comprehensive set of critical thinking skills.

As Cenker (2014) states, the role of universities is influenced by the commercialization of knowledge focused significantly on the production of quantitative indicators and thus its social role as a place of freedom of thought, solidarity and engaged ethics is disappearing.

Teachers believe they are already teaching critical skills, and students believe they are already learning critical skills, and both groups are often mistaken as well as resistant to change.

At the higher education institution (HEI), the ways of knowledge transfer conducted through two key processes of teaching and learning need to be changed. Moreover, a mutual interaction between teachers and students needs to be focused on discussion, exchanging, and accepting the different points of views and reflecting on them.

At the Matej Bel University the focus on developing critical thinking among teachers and students had begun some decades ago. But the meaningful attention to critical thinking has been given since 2018 by performing the project titled 'Developing critical thinking skills through a coaching approach' where the teaching process was observed to find out how teachers can enhance the CT among their students. The key outcomes of that project were two textbooks giving some fundamental guidelines how CT can be developed at HEI. The authors in the context of the current challenges, have formed the following conclusions and recommendations:

1. Critical thinking is a set of skills that can be learned and that need to be constantly trained and improved.
2. Only a teacher who thinks critically himself (herself) can teach and develop this skill in his/her students.

3. The application of the coaching approach in the formation of critical thinking means an orientation on the development of the individual, his/her perception, and observation of what is happening around him/her and in society as well as his/her active involvement in society or in global events.

4. To think critically in the 21st century means to accept it as a new philosophy of life as well as another lifestyle (Theodoulides et al., 2020).

Recently, the transversal competences of the students at the higher education are examined within another scientific project in which set of critical thinking skills is the key component. A new and rather innovative qualitative research methodology has been implemented in pilot study in 2020 to test how CT of the university students can be assessed and evaluated. This methodology has supported the argument to those crucial findings (1 – 4) already presented above.

1 Implementation of the Critical Thinking at the Higher Education

Critical thinking calls for a persistent effort to examine any belief or supposed form of knowledge in the light of the evidence that supports it and the further conclusions to which it tends. It also generally requires ability to recognize problems, to find workable means for meeting those problems, to gather and marshal pertinent information, to recognize unstated assumptions and values, to comprehend and use language with accuracy, clarity, and discrimination, to interpret data, to appraise evidence and evaluate arguments, to recognize the existence (or non-existence) of logical relationships between propositions, to draw warranted conclusions and generalizations, to put to test the conclusions and generalizations at which one arrives, to reconstruct one's patterns of beliefs on the basis of wider experience, and to render accurate judgments about specific things and qualities in everyday life (Glaser, 1941 in Yancy, 2019).

Critical thinking skills of the university students in the field of pedagogy-tutorage (sample of 116) were examined by using the Glaser – Watson methodology. The tested students achieved an average value of their ability to think critically of 41.8, which is very low compared to the maximum score of 80. Slovak students achieved the lowest values in comparison with students from the Czech Republic, which score was 47.5 as well as with the studied students from Great Britain scoring 61.4 (Kosturková, 2014).

CT researcher and the founder of the Foundation of the Critical Thinking Richard Paul sharpens the definition of CT stated that critical thinking is that mode of thinking-about any

subject, content, or problem-in which the thinker improves the quality of his or her thinking by skillfully analyzing, assessing, and reconstructing it. Critical thinking is self-directed, self-disciplined, self-monitored, and self-corrective thinking (Paul, 2004).

Paul (1993) in his earlier work noticed that the most troubling aspect, though, is that teachers themselves lack CT skills and therefore are in no position to teach CT skills, even if the curriculum demanded it. He also claimed that: *'so whether we consider the future of our students in an international or domestic context, we cannot avoid the conclusion that there is a problem: students aren't learning the critical skills they need, and teachers are resistant to learning and teaching them'*. (Paul, 1993; Paul and Elder, 1997).

Markoš (2019) explains that critical thinking includes certain knowledge that will help us orient ourselves in today's public space, as well as several skills to be able to analyze the amount of news and information that virtual space produces.

Why this set of skills and knowledge are so important nowadays? It is because human beings are vulnerable in virtual world. We became addicted to new technologies, and we need a tool to protect us from conspiracies, manipulation, fake news and to be able to deal with cognitive biases and stereotypes. To be able to think critically gives us a spiritual power and freedom.

The CT is not just one skill, but it consists of several mental activities. Those are described as a complex process which involves a range of actions, skills, and attitudes, which can be observed during learning process. Those are as follows:

- Identifying other people's positions, arguments, and conclusions,
- Evaluating the evidence for alternative points of view,
- Weighing up opposing arguments and evidence fairly,
- Being able to read between lines, seeing behind surface, and identifying false or unfair assumptions,
- Recognising techniques used to make certain positions more appealing than others, such as false logic and persuasive devices,
- Reflecting on issues in a structured way, bringing logic and insight to bear,
- Drawing conclusions about whether arguments are valid and justifiable, based on good evidence and sensible assumptions,
- Presenting a point of view in a structured, clear, well-reasoned way that convinces others (Cottrell, 2005).

Ciulla (1996) stated that there are two main goals to teaching critical thinking at the higher education institution. The first is to develop analytical skills for finding fallacies in arguments

and to explore the nature of truth and validity (educating the head). The second focuses on interpretive skills and the emotive content of language (educating the heart). Students shall be able to read between the lines of texts, become aware of their own biases and the way in which these biases colour their understanding of the world.

Slovakia is one of the post-communist Eastern Europe countries where the legacy of education system which pushed for functionality, uniformity and memorization of information is noticeable. From primary schools to university, students come to take notes and listen to the teacher. Assessments are aimed to test how well students memorized and understood the material rather than encouraging them to interact with it and apply to the real world.

2 Research methodology and results

A pilot research project aimed to identify, assess, and evaluate the critical thinking skills of graduate students. The two recorded seminars during the subject of the international management and marketing were analysed where 12 students' individual performance was evaluated during the first semester session and the last session (pretest and posttest analysis).

The research strategy and methodology have been developed by using several theories for instance theoretical approach on critical reflection by Brookfield (1997, 2012, 2017), framework of the critical thinking standards in teaching and learning defined by Paul and Elder (1997), critical pedagogy concept by Johnson and Morris (2010) and critical reflective analysis developed by Theodoulides and Jahn (2013).

This paper's central thesis is that assessment of the CT can be structured as the standardized and socially constructed process.

Referring to Brookfield's comments that if CT is necessarily social process than its assessment should be also a social process involving multiplicity of experiences, contributions, reflection and perceptions (Brookfield, 1997).

Paul and Elder (1997) described **elements of reasoning**: *purpose, question at issue, assumptions, point of view, information, concepts and idea, interpretations, and implications* together with the **standards of reasoning** i.e. *clarity, accuracy, precise, relevant, depth, breadth, and logic* which are used to assess those elements of reasoning.

Another approach which is the critical pedagogy concept developed by Johnson and Morris (2010) highlights the praxis consisting of *reflection, action, engagement, and possibility*.

However, despite of all these helpful accounts of CT, a more simply approach to assessment has been implemented. When we think, analyze information and/or discuss various points of view, we think for a purpose which is based upon our assumptions that lead to implications and consequences. Students during their learning process use theories, concepts, idea to interpret data, facts and experiences in order to solve problems and answer questions. To assess students' critical thinking skills the framework of key parameters reflecting students' abilities to implement this set of CT skills have been developed and are presented in Tab 1.

Tab 1 Parameters for critical thinking skills' assessment

| Parameters | Parameter description |
|---------------------|---|
| Text analysis | Finding fallacies in arguments and conclusions. Questioning data and information rather than accepting it as true |
| Structural analysis | Understanding deeper causes and roots of a situation and problem= structural analysis. Politicising notions of culture, knowledge, power = understanding the media manipulation |
| Open mindness | Understanding and accepting the existence of other viewpoints. Ability to accept and interact with the opposing viewpoints and modify one's own viewpoint when necessary. |
| Dialogue skills | Ability to lead non-agresive conversation and to formulate coherent and factual arguments to reflect the participants viewpoints. |
| Problem - solving | Able to suggest a solution and evaluate the benefits and potential side-effects of a chosen solution. |
| Bias reflection | Understanding and reflecting on one's own biases (understanding the biases of the society + their own). |

Source: own processing

Reflective assessment and evaluation of the CT skills

Reflection is defined as a cognitive process in which people attempt to increase their awareness of personal experiences and therefore their ability to learn from them (Gray, 2007). Dualism in any reflection process has been identified by Anseel, Lievens and Schollaert (2009). They suggest that reflection as a dual process model of information processing and the depth of elaboration of complex data, influences learning and behavioural outcomes.

During the process of education reflection interventions provided by teachers are helping students to switch their mode of data, information and knowledge processing from passive

(automatic) to conscious that led them to critical thinking and better learning. The reflection opens the door for effective information flow and interactions which are inevitably important to build good relations based on trust. Mutual understanding and trust between teacher and student are framed by both-ways communication, exchange of information and giving - receiving feedback.

The research questions have been formulated, as follows:

1. Using the reflection method, how long does it take to see measurable improvement in critical thinking skills?
2. Is the improvement static or dynamic? (In other words, did the students improve at a basic level and stay there, or did they continue to improve?)
3. Is there a measurable difference in the students' critical thinking skills?

To address those research questions the Critical Reflection Analysis (CRA) developed by Theodoulides and Jahn (2013) is a method for evaluating key parameters those set for CT skills assessment. CRA has its base in Critical Reflective Practice (CRP) as a research method which definition is embodied in the three words that make up the name: *critical or critically*, relating to critical education theory; *reflective* for reflecting on actions; and *practice* describing an educator's day-to-day practice. The CRA/CRP method is most associated with education research and has evolved from a blending of action research and critical autoethnography. These approaches are still a relatively new research forms, having been utilised for only the last two and a half decades as a discrete method, but it has achieved growing recognition especially through the work of Brookfield and Smyth. Both have written books that offer similar guidelines for conducting critically reflective research and encourage secondary-level (Smyth) and tertiary-level (Brookfield) level teaching practitioners to adapt their methodologies (Brookfield, 2017; Smyth, 1992).

CRA is considered as a broader method that can be utilized and generally applied for monitoring of any social process. Its aim is to offer a solution and to provide quantitative measurements as well as the qualitative evaluation of observed social processes which might be difficult to measure. Therefore, critical reflection analysis is described mainly as a qualitative method, but it is performed by using evaluation scales and ranges that are expressed in quantitative measures.

3 Findings and discussion

The obtained results provide the important evidence for further discussion and improvements. In Tab 2 there is an example how evaluated parameters were defined in quantitative and qualitative way. The specific parameters were assessed and evaluated in those two sessions (pretest and posttest assessment) to observe an improvement in students' critical thinking process. Three independent evaluators did the assessment separately and after that a consensus meeting was organized with the aim to agree on one mutual score for each student/ each parameter. The assessment and evaluation of six parameters was scored within the range from 0 to 4 (0 points = poor, 1 point= fair, 2 points = insufficient, 3 points= good, 4 points = excellent) where each point was described also with specific qualitative verbal comment.

The pretest – posttest assessment format provided some interesting findings. Based upon these results we can see that students improved their skills particularly in text and structural analysis, in identifying several assumptions, conducting a debate with polarizing points of views, proposing several ways to check them and generate several alternative interpretations. Overall students' capacity to think critically was growing. Only in problem-solving criteria there was no significant improvement.

Tab 2 Cumulative Score Comparison

| Parameter | Pretest cumulative score | Posttest cumulative score |
|---------------------------|--------------------------|---------------------------|
| Text analysis | 14 | 18 |
| Structural analysis | 12 | 14 |
| Openmindness and emphathy | 11 | 15 |
| Dialogue skills | 11 | 15 |
| Problem solving | 13 | 13 |
| Bias reflection | 10 | 14 |

Source: own processing

Conclusion

In this pilot study, students' CT has shown considerable progress and their ability to reflect on their worldviews, as well as their ability to discuss and deconstruct opposing views. As compared to a general view testing CT skill, this methodology based upon CRA provided deeper understanding how CT can be developed, assess throughout specific parameters and to

measure the student's progress. Moreover, I have found out and tested some teaching methods and techniques which are focusing onto the enhancement of CT skills.

The four sessions - course during which pretest and posttest assessment was conducted received overly positive feedback. The students felt challenged and heard. Yet, I was also surprised to hear, quite explicitly, that some of the students did not feel ready to change their opinions despite recognizing societal and family biases.

Therefore, the proposed methodology placed a high priority on helping teachers as well as their students to find out why critical thinking is important to them, and quickly applying it to their interactions that are interesting and relevant to their lives, rather than spending a lot of instructional time on uninteresting abstract concepts learning.

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