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A Model of Critical Thinking as an Important Attribute for Success in the 21st Century

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Abstract

The aim of this paper is to suggest a specific teaching approach which employs a critical thinking model, as well as to show the possibilities for structuring professional knowledge and enhancing learning efficiency. Entering the world of global competition, the emphasis is on the need to prepare students to be communicative, collaborative, creative, innovative, to think critically and analytically, and to be able to effectively solve real-world problems. With higher-order thinking skills, which are essential for absorbing knowledge as well as for work performance, students will become effective communicators, critical and dynamic thinkers, competent problem solvers and career experts. By utilizing innovative pedagogy to support teaching and learning goals, students will be more likely to achieve their full potential and have their voices heard. The paper focuses on critical thinking for undergraduate ESP engineering students. Those students need strong critical thinking skills which are essential to get to the root of problems and find reasonable solutions. A model of critical thinking is designed to help those students to develop their thinking skills and prepare for a global, complex society.

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1. Introduction

This paper presents a critical thinking model within the ESP undergraduate engineering learning environment. The ability to think critically is considered as one of the desirable outcomes of an undergraduate education (Facione et al., 2000). Entering the world of a global market, “employers seek graduate employees who are able to transfer their

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critical thinking abilities to the workplace” (Tapper, 2004) and use a language “in the service of thinking and problem solving” (Cummins, 1981).

Critical thinking can be embedded in the instruction of a variety of academic disciplines, and faculty can engineer their course focus so that it is more thinking-skills-based (Halpern, 1998).

With this in mind, it is argued that educators should help students to become successful for future work performance. In order to be prepared to succeed in life, education must focus on developing the critical thinking skills of students. With these skills students will be prepared to cooperate successfully, think critically and analytically, communicate effectively and solve problems efficiently in the workplace. Such activities require students to be involved in active learning, be engaged in high-level problem-solving skills and be able to participate in team activities. So, “students will develop strong leadership, communication, and teamwork skills, cross-cultural and cross-national awareness, and most important, confidence in their ability to contribute to the science and engineering community” (Kalonji, 2005).

2. Learning objectives

As Brown (2004) states “the objectives of a curriculum should not be limited to linguistic factors alone, but also include developing the art of critical thinking”.

Critical thinking is one of the main objectives of the contemporary curricula. It is “reflective decision-making and thoughtful problem-solving about what to believe and do” (Facione & Facione, 2007; Facione, 2011). “It 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” (Scriven & Paul, 1996). In this regard, we have designed a critical thinking course in order to develop students’ ability in critical thinking, and to apply this thinking to address issues related to the professional context.

At the end of this course students will be able to:

- know specific terms related to their future profession;
- know principles and theories of engineering;
- understand, analyze and interpret related information;
- apply knowledge to new situations;
- ask questions and seek answers to those questions. Paul and Elder (2004) propose that the art of questioning is essential to the art of learning, and that, to the extent that they fail to ask genuine questions and seek answers to those questions, students are not likely taking the content seriously;
- apply engineering principles to suggest solutions to contemporary social problems;
- communicate, including oral (speaking and listening) and written (writing and reading) skills (Živković, 2013, 2015a);
- work cooperatively with their peers.

3. 3. A proposed model

Based on what have been stated above, this paper will focus on presenting a critical thinking model in engineering classroom. Here, we apply a Facione’s (1990) model which suggests 6 skills each of which is broken down into sub-skills. It results in “interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations that judgment is based upon” (Facione, 1990, p. 2).

Skills Sub-skills

Interpretation

categorization
decoding significance
clarifying meaning

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