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The Role of Thinking in Soft Skills

Immaculate Sherin P G

Research Scholar
Department of Humanities
National Institute of Technology, Trichy, **INDIA**.

Dr. S. Mekala

Assistant Professor
Department of Humanities
National Institute of Technology, Trichy, INDIA.

Abstract

In the context of globalization, the demand for soft skills has increased tremendously in the recent years. The corporate world expects a learner to be adept in soft skills as these innate skills or abilities are necessary pre-requisites for the incumbent to interact in his/ her workplace environment as independently as possible. Thinking skills is one of the significant skill-sets classified under soft skills. In the technical scenario, the employers acknowledge that the job entrants are sound in technical skills, but are lacking in the required soft skills such as problem solving, decision making, innovation and self-regulation. So, there is a need to educate the engineering students on these seed skills, which promote their attitudinal and interpersonal skills and look beyond the technical domain. In this respect, this paper highlights the role of thinking skills in enhancing the soft skills of the students which, in turn, enables them contribute successfully in their professional career. This paper further concentrates on higher order thinking skills and its application in their workplace situations.

Keywords: Soft Skills, ThinkingSkills,Engineering Students.

Introduction

In the context of Globalization the demand of soft skills has increased tremendously in the recent years. Employees prefer to hire and promote candidates who are resourceful, ethical and self-directed in their career prospects. According to Serby Richard (2003) modern corporate requirements are such that they look specifically for those candidates who can add values to their organizations. Hard skills contribute to only 15% in one's success while remaining 85% is occupied by soft skills (Watts M and Watts R.K, 2008). For decades, employers as well as educators have a common complaint that skills shortage remains to be a major constraint and the incumbents' lack in soft skills has become a persistent barrier in the continued growth of the Indian economy.

Employers Expectations

The current Global century is witnessing a paradigm shift in engineering education to meet the needs of 21st century skills and learning styles. According to the survey conducted by the World Bank on "Employability and Skills Set of Newly Graduated Engineers in India (2011)", a majority of employers in India are not satisfied with the skills of newly hired engineering graduates. Only 64% of employers said that they are somewhat satisfied with the current engineering graduates; about 3.9 % of employers rate the skills as 'not at all satisfied'; while 16.1 % are 'not very satisfied'. The Federation of Indian Chambers of Commerce and Industry (Ficci) in 2010 found a majority of graduates lacked adequate "soft skills" to be employed in the industry. The survey report authored by Andreas Bloom and Hiroshi Saiki (2011) found that engineering graduates were not good at problem solving, creativity, use of modern tools, system designing to needs application of engineering education.

Skill Gap

In today's knowledge fuelled world, there exists an explicit gap between what is expected and what is delivered by the engineering students. As skills acquired at school and at the workplace become obsolete more quickly in the globalization era, higher-order thinking skills and an ability to learn new and more complex skills are indispensable to respond to accelerating technological change. In the 21st century workplace, employers expect their workers to possess a wide range of skills and competencies in this global competitive environment. The core set of skills expected by companies include being knowledgeable, thinking outside the box, being smarter in sourcing information, possessing good people skills, having an ability to solve problems, being able to work as part of a team and ultimately become a lifelong learner.

The Blooms Taxonomy of Educational Objectives suggest the existence of three domains of learning.

- Cognitive skills involve knowledge and the development of intellectual skills
- Affective skills include the manner in which we deal with things emotionally such as feeling, values, appreciation, enthusiasm, motivation and attitudes
- Psychometric skills encompass physical movements, coordination and the use of motor skills.

According to the classification of Blooms Taxonomy, the first three cognitive skills in the inverted pyramid are categorized in the higher order thinking skills and the next three cognitive skills comes under the lower order thinking skills. Researches have indicated that the learning outcomes of the cognitive domain are more focused in the engineering education, regrettably in the lower order thinking skills (LOTS: know, comprehend and apply) and very less emphasis is laid on higher order thinking skills (HOTS: analyse, evaluate, create). Psychomotor skills receive due attention but the affective domain is overlooked in engineering education. The dominance of educational objectives in cognitive and psychomotor domain in engineering education has suppressed the development of affective characteristics among the learners which contributes to the dissatisfaction of the recruiters and employers.

Revised Bloom's Taxonomy, 2011`

It becomes evident that Skill gap is substantially high in higher order thinking skills. Graduates are relatively better in the execution of lower order thinking skills but they fall short in meeting the demand for higher order thinking skills.

Higher order Thinking Skills

Higher order thinking skills comprise critical, logical, reflective, metacognition and creative thinking. The *critical thinking* category includes definitions that refer to 'reasonable, reflective thinking that is focused on deciding what to believe or do' (Norris & Ennis, 1989) and 'artful thinking', which includes reasoning, questioning and investigating, observing and describing, comparing and connecting, finding complexity, and exploring viewpoints (Barahal, 2008). Bransford and Stein (1984) point out that *problem solving* is the general mechanism behind all thinking, including recall, critical thinking, creative thinking, and effective communication. It is this kind of thinking, according to Brookhart (2010) that applies to life outside of school where thinking is characterised by 'a series of transfer opportunities (rather) than as a series of recall assignments to be done'.

Higher order thinking enables in understanding facts, inferring content, connecting to other concepts, categorize them, compile in novel ways and apply them while seeking new solutions or problems. They are activated when individuals encounter unfamiliar problems, uncertainty, questions or dilemmas. Successful application of the skills result in possible explanations, clear decision making and exceptional performance that are valued within the context of knowledge and experience.

Engaging students in Higher order thinking skills

Teachers could incorporate the Bloom's Taxonomy as a framework to teach thinking skills in a structured way.

(i) Specifically teaching the language and concepts of higher-order thinking:

Teachers should not only teach the language and concepts but also tell students what they are doing and why higher-order thinking skills are necessary for them to problem-solve at school and in life. For example, by using a common language, students can recognise the skill they are exercising and the level of complexity of a question. When they see words like 'define', 'recognise', 'recall', 'identify', 'label', 'understand', 'examine', or 'collect', they know they are being asked to recall facts and demonstrate their knowledge of content. When they see words like, 'apply', 'solve', 'experiment', 'show', or 'predict', they understand they are being asked to demonstrate application. And when a question begins with 'appraise', 'judge', 'criticise', or 'decide', they understand the higher-order thinking skill they are practising is 'evaluation'.

(ii) Planning classroom questioning and discussion time to tap into particular higher-order thinking skills:

Teachers, are very good at 'thinking on their feet'; but then they could devise a meticulous plan to ask questions that require higher-order thinking. Similarly, discussions could be planned with a higher-order thinking learning objective in mind. It is useful to ask a colleague to observe a class with a view to recording the percentage of higher-order thinking skills practiced in a lesson; or even to ask students to use the knowledge they have gained in learning the language of thinking to record the teacher's use of higher-order terms; or to observe and assess their classmates in planned activities. Teachers should also encourage students to reflect on their learning so they understand their thinking strengths and weaknesses.

(iii) Explicitly teaching subject concepts:

Students should be made aware of the key concepts they must learn. They must be able to identify them and they must practice them. Teachers can help by alerting students when a key concept is being introduced, and identifying the explicit characteristics of the concept. Students need to understand whether the concept is concrete, abstract, verbal, nonverbal, or process. Teachers have to spend time helping students to make strong connections between the manipulation of the symbols, the associated language and some form of concrete materials and images. Some students need to be *shown* how to solve a problem, some students *told*, and some need both.

Thomas and Thorne (2009) suggest a multi-step process for teaching and learning concepts, which includes:

- name the critical (main) features of the concept
- name some additional features of the concept
- compare the new to the already known
- name some false features of the concept
- give the best examples or prototypes of the concept (what it is)
- give some non-examples or non-prototypes (what the concept isn't)
- identify other similar or connected concepts.

(iv) Providing scaffolding:

Scaffolding involves giving students support at the beginning of a lesson and then gradually turning over responsibility to the students to operate on their own (Slavin, 1995). Kauchak and Eggen (1998), propose the following guidelines:

➢ Use scaffolding:
  - During initial learning, with a variety of examples to describe the thinking processes involved
  - Only when needed, by first checking for understanding and, if necessary, providing additional examples and explanations
  - To build on student strengths and accommodate weaknesses.

- Provide structured representations and discussions of thinking tasks:
    - Visually represent and organize problems in concrete examples such as drawings, graphs, hierarchies, or tables
    - Demonstrate how to break up a thought problem into convenient steps, using a number of examples and encouraging students to suggest additional examples
    - Discuss examples of problems and solutions, explaining the nature of problems in detail and relating the worked-out solutions to the problems. This practice reduces the student's need for additional teacher assistance.

- Provide opportunities for practice in solving problems
    - Provide teacher-directed practice before independent practice, spot-checking progress on practice and providing short responses of less than 30 seconds to any single request for assistance
    - Assign frequent, short homework assignments that are logical extensions of classroom work
    - Link practice in the content area to complex, real-life situations.

(V) Consciously teach to encourage higher order thinking

In order to foster deep conceptual understanding, consider using the following strategies:

- Teach skills through real-world contexts
- Vary the context in which student use a newly taught skill
- Emphasize the building blocks of higher-order thinking
    - Build background knowledge
    - Classify things in categories
    - Arrange items along dimensions
    - Make hypotheses
    - Draw inferences
    - Analyse things into their components
    - Solve problems
- Encourage students to think about the thinking strategies
    - Using assignments and assessments that require intellectual work and critical thinking is associated with increased student achievement. These increases have been shown on a variety of achievement outcomes, including standardized test scores, classroom grades, and research instruments.

According to Pogrow (2005), the 'Higher Order Thinking Skills' is based on four kinds of thinking skills: (i) metacognition, or the ability to think about thinking; (ii) making inferences; (iii) transfer, or generalizing ideas across contexts; and (iv) synthesizing information. Finally, research has shown that student motivation increases when teachers hold them accountable for higher-order thinking. Teaching students higher-order thinking tasks forces them to engage in thinking about particular things, and undertaking assessment that requires intellectual work and critical thinking.

Suggestive Measures and Possible Solutions

- Curricula could be redesigned in a way such that students involve themselves in experiential learning that in turn escalates them to become independent learners in the long run.
- The institute - industry interaction has to be part and parcel of the higher education system.
- Teaching-learning sessions could be reoriented towards facilitating discussions, comprehending and posing intelligent questions and developing their analytical skills.
- The assessment methods can be reconsidered to focus on higher order thinking skills.

Conclusion

Soft skills are considered important across sectors, regions and firms. The employers demand improvement in higher order thinking skills, as the Engineering firms require analytic, adaptive and creative engineers to upgrade the available infrastructure. The incumbents seeking placement are expected to develop attributes of soft skills and be adept in judiciously employing those skillset in their workplace. Hence the onus lies on the educators to impart the requisite training and education during their graduation and shape the individual's personality for their career prospects. It is a shift towards a simple conceptual framework—Skills Toward Employment and Productivity (STEP) that can help policymakers, analysts, and researchers think through the design of systems to bestow skills that in turn enhance productivity and growth.

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