Challenges in Aligning Skills with Global Best Practices: Indian Scenario

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ABSTRACT

There is a growing concern on the quality, standards and recognition of engineering education globally. Consequent upon this trend, the paper addresses issues, concerns and challenges for the Indian engineers a few benchmarks for ascertaining and assuring high quality practices at different levels, as a significant process. This paper highlights the initiative by the National Board of Accreditation (NBA) with Washington Accord (WA) to promote the concept of best practices benchmarking in technical education. Through the World Summit on Accreditation (WOSA-2016) it sets the stage for a discussion on the identification, sustenance, dissemination and adaptation of best practices globally and their relevance in the Indian context. Benchmarking is an ongoing systematic means for measuring and comparing the work processes of a technical course with any particular set of outcome parameters. The paper addresses and analyses the various schemes of global best practices in the accreditation arena. The challenge is to identify systematically the urgent need to ensure best practice schemes in technical programs. The benchmarking exercise indicates a rigorous quality assurance arrangement. With the adoption of Washington Accord our current quality assurance arrangements in engineering education is becoming considerably strong over the period of time and exposure with experience.

Keywords: Global Best Practices, Washington Accord, Benchmarking, Outcome Parameters.

INTRODUCTION

Recent research indicates that a consensus is emerging around the principles that guide the design, delivery and assessment of effective technical education programs. This consensus is guiding a clearer understanding of the knowledge, skills, beliefs and attributes that programs will enable future students to learn, particularly regarding learning content in the course curriculum. Well-written learning standards synthesise this research into a vision of effective learning and clearer expectations for what beginning students should know and be able to do. They are also giving greater coherence to program design, delivery and assessment. Several studies have synthesised best practice and research on the characteristics of programs that enable graduate students to meet these challenging standards by providing an insight into the tentative synthesis of best practices globally in accreditation mechanisms. The well-designed programs have:

1. *Coherence*, based on a common, clear vision of good learning;

2. A *strong core curriculum*, taught in the context of practice, through knowledge in curriculum, assessment and subject-matter pedagogy;
3. *Extensive standard practices* that are carefully developed to support the ideas and practices presented in simultaneous, closely interwoven course work;
4. *Well-defined standards of professional knowledge and practice* used to guide and evaluate course work;
5. *An inquiry approach that connects theory and practice*, including regular use of case methods, analyses of learning, through learning real problems of practice and developing students as reflective practitioners;
6. *Strong partnerships* that develop common knowledge and shared beliefs among students and faculty, allowing to learn state-of-the-art practice for diverse learners and collegial learning; and
7. *Assessment based on professional standards* that evaluates learning through demonstration of critical skills and abilities using performance assessments and portfolios that support the development of 'adaptive expertise' [1].

DESCRIPTIVE METHODOLOGY

Accordingly, the best practice transition and induction programs:

1. are guided by professional standards,
2. involve mentoring where mentors are carefully selected for their expertise and receive ongoing training;
3. include classroom-based learning opportunities for new students;
4. provide continuing professional development; and
5. supported through the provision of resources.

As learning develops a more complex knowledge base and more challenging goals for student learning, it is increasingly important that the transition into learning be a carefully staged process, as with most professions. Effective transition from graduation to registration requires opportunities to work 'shoulder to shoulder' regularly with experienced faculty. It also requires opportunities to engage in standards-guided professional learning around aspects of learning that can only be learned effectively when new students begin to work in colleges. These best practice principles provide a sound basis on which to benchmark Indian student technical education programs.

Benchmarking Indian Technical Education

As the quality of professional programs depends to a significant extent on the wider policy and regulatory context within which they operate, benchmarking can be addressed in two levels:

1. at the program level, and
2. at the system level, based on arrangements for assuring the quality of student education programs.

Best practice at the program level is dependent on a range of policies at the national level: for example, policies concerning recruitment, selection, providers, accreditation [2], college experience, graduation standards and entry to the profession.

Benchmarking Indian technical education programs against world's best practice design principles

As reliable and representative data about current practices and outcomes in Indian technical education exist with NBA, it is a good exercise to benchmark Indian practices accurately against those in other countries. However, the data sets out:

1. Graduate Student Standards: the knowledge, skills and attributes expected of graduates of nationally accredited programs; and
2. Program Standards: the key features expected of high-quality initial student education programs.

Our assumption, for the purposes of international benchmarking, is that if a program has gained accreditation, it has these characteristics and meets these standards. Although this approach to benchmarking has clear weaknesses, relying as it does on the content of the Indian Program Standards, rather than evidence of implementation and outcomes, it does indicate that the fundamental dimensions of effective technical education programs are reflected in the Indian Program Standards. Our review indicates that the Program Standards and the best practice principles for the design, delivery and assessment of student education programs have much in common [3]. There are clear indications that India is moving toward a standards-guided student education system where standards of professional knowledge and practice are used to guide and evaluate course work and practical work

There are studies of individual programs giving clear indications that several Indian programs are implementing the best practice principles for the design, delivery and assessment of student education programs. It aimed to provide a comprehensive mapping of student education programs in India. Based on available data, the review indicates how little we know about the outcomes of individual student education programs in India, not only with respect to each other, but internationally. India's student education system currently has the capacity and the measures to monitor its own performance and, therefore, to promote improvement. The current accreditation system is having an impact on the quality of student education or graduate outcomes. Ideally, benchmarking focuses mainly on valid outcome measures. It thereby encourages innovation, diversity and experimentation in technical education, not standardisation. Well-written standards for graduating students set out what beginning students should know and be able to do, no matter what the program, or where they are going to reach. There are many ways to prepare students so that they meet entry standards for the profession. However, it should be non-negotiable that providers can demonstrate that their approach enables graduates to meet those standards.

Given the importance of high-quality student education for India's technical education system and its aspirations to re-join the high-achieving countries, research is needed to build a sounder basis on which to benchmark program outcomes nationally and internationally. High-achieving countries have stable and effective policies and mechanisms in place to assure the quality of initial student education entrants, programs and program graduates [4]. The policies and mechanisms determine who gains entry to student education, which providers are allowed to train them and who gains full entry to the profession. These policies concern:

- High-achieving countries have stable policies in place to assure the quality of entrants to student education,

- High-achieving countries have regulated student education systems and rigorous procedures for the accreditation of student education programs
- High-achieving countries require and support a period of mentored induction coupled with rigorous assessments of readiness for full entry to the profession.

We need more rigorous procedures for assessing and accrediting the quality of student education programs, based primarily on evidence about the knowledge and skills of graduates and their destinations. Full entry to the profession follows a period of mentored support and valid evidence that registration standards have been met. These are the **enabling** conditions that need to be in place if India is to realise its potential to make best practice in student education common practice.

Capability Framework has recently been proposed at the institutional level. The Framework describes the broad capabilities required for a range of job roles in the engineering sector. It provides a common language for the knowledge, skills, behaviours and attitudes that practitioners will display if they are performing well in their roles. The purpose of the Capability Framework is to assist Training groups with their management processes and to guide ongoing professional development and build career path. The framework consists of:

- Three Levels that reflect the expertise and responsibility required of Practitioners
- Four Domains describing the specialist skills required of Practitioners
- Six Skill Areas that address more generic work skills required for Practitioner job roles as indicated in the Figure 1.

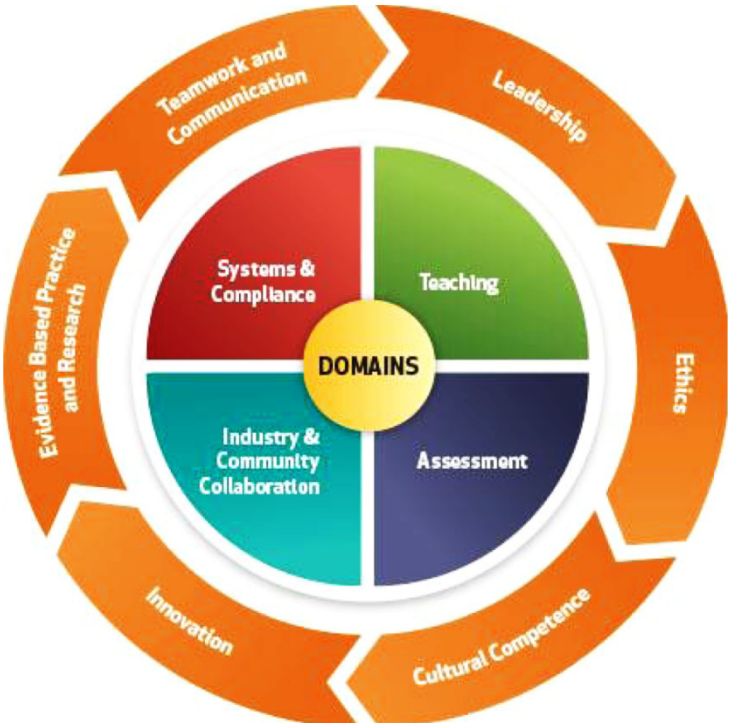

Fig. 1: Professional Development Framework (Domains)

TYPES OF BENCHMARKING

Experts have identified different types of benchmarking. These are internal, functional, competitive, and generic benchmarking. *Internal benchmarking* is done within an organization and typically between closely related units, using common or shared performance parameters as a basis for comparison.

Functional benchmarking is a comparison of performance and procedures between similar functions, across different organizations. *Competitive benchmarking* generally focuses on direct competitors and with specific comparable operations. *Generic benchmarking* is undertaken with external institutions which represent the 'best-in-class' for particular aspects of the selected operations. When companies realised it was easier to learn from organisations with whom they were not in competition, they adopted this approach.[5]. There is yet another type where *Best Practices Benchmarking* is advocated for self- improvement.

Various definitions exist of what constitutes the Best Practices Benchmarking. A group of leading high technology corporations sees a benchmark as 'the best-in-class achievement which becomes a recognized standard of excellence against which similar things are compared. In spite of the variation in perspectives, the overall purpose and intent of the Best Practices Benchmarking can be summarized as the development of an understanding of the fundamentals that lead to success, focus on continuous improvement efforts, and management of the overall change process to close the gap between an existing practice of the institution and that of the best-in-class institutions with reference to the most relevant key performance variables.

The significant contribution of this work was a recognition that the same basic outcomes such as problem solving, use of knowledge, design and communication would apply in all three cases provided that level of performance is adequately differentiated between the three types of qualification [6].

Rather than specify detailed levels of performance for each outcome, it was recognised that the required level of problem solving defines the level of performance against several outcomes. Figure 2 attempts to capture the thinking underlying the Graduate Attributes.

Three related attributes, the abilities in problem analysis, synthesis of solutions and evaluation of the impact of the solutions, define the basic processes of engineering, including design and investigation. The process is shown in a highly schematic form in Figure 2, operating on problems of a defined level of demand. Supporting these we have the use of mathematical, natural science and engineering knowledge – both fundamental and specialist - applied to problem solving at the exit level of the degree. Contextual knowledge is required to support problem solving and, in particular, to evaluate the social, economic and environmental impacts of solutions. The ability to manage projects, communicate, to work in teams and to work across disciplinary boundaries is essential to problem solving. This is referred to in the Graduate Attributes definition for detail [7]. Two statements capture, for each type of programme, the level of problem solving and the level of engineering activity, the latter being more relevant at the professional level.

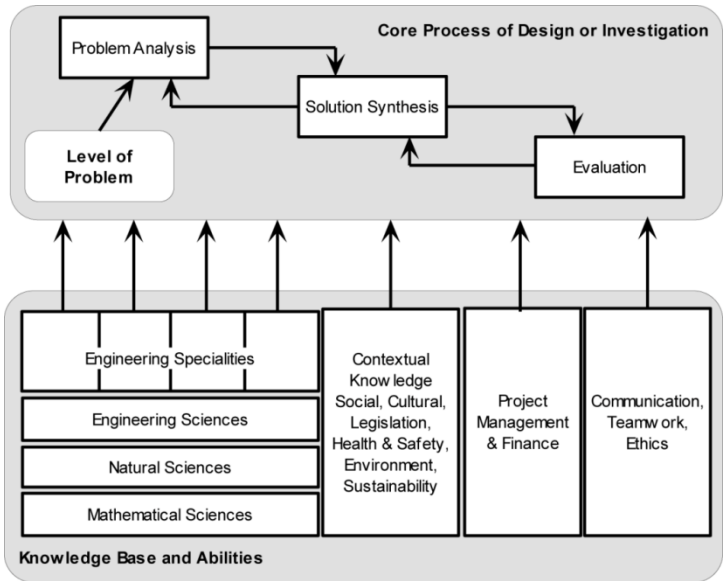

Fig. 2: A Conceptual Model Underlying the Graduate Attributes

Global Best practices are perceived to have specific characteristics. These are important predictors of their success. For example, a practice requires widespread acceptance by groups, social systems and also by individuals. Only then can it become successful to be put into practice by the organization and will, in the long run, be adopted by other institutions. In order to analyse these specific traits and implications, the following four themes require an in-depth discussion:

- identification of best practices,
- sustainability of best practices,
- dissemination of best practices, and
- adaptation of best practices

For most institutions of technical education the desire to learn from each other and to share aspects of good practice is almost as old as the institutions themselves [8]. With the emphasis on collegiality, such desires have traditionally manifested themselves in numerous ways: professional associations, both academic and non-academic; meeting *Best Practices Benchmarking in Education for Quality Enhancement.*

SUMMARY AND CONCLUSION

This paper presents an overview of a practical scheme of best practices globally vis-à-vis Indian context. The overview is contemporary global standards of technical education constituting a massive, complex system of exchanges virtually encompassing all aspects. The paper highlights the key positive aspects of global best practices in technical education to create an opportunity for collaborative effort in generating positive outcome on standards in technical education in India. Increasingly this approach represent the output from the complex system that globalization of technical education has become and a challenge to predict. Scholars and policy makers recognize that global best practices awareness and practice is a necessity for innovation to achieve high

expectations. This work highlights the seriousness, urgent necessity and a challenge as a function of parameters to meet the international standards in global best practices in various levels of accreditation.

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