

Comparison of Indian Quality Assurance Model and Accreditation Parameters of Higher Education with International Standards

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Abstract: The globalization of higher education has become one of the most significant factors for the academic, social, and political promotion of a country. Quality human resources and knowledge workforce plays a vital role in the emerging environment and digital economy. Assessment and Accreditation (AA) of education ensures the quality of education and make the system more responsive to demand and accountability. This paper explores international quality assurance models and compares the significant quality parameters of higher education with the Indian accreditation system. India's accreditation bodies, National Assessment and Accreditation Council (NAAC) and National Board of Accreditation (NBA) maintain the quality of higher education in India which evaluates the institutional and programme standards respectively. The research mainly adopted generic quality parameters identified by the global accreditation agencies for the survey and feedback from the educational experts in higher education. The paper aims to propose a quality assurance framework model that matches with global standards.

Keywords: Quality Assurance, Higher education, Accreditation, Quality framework

1. Introduction

Higher education is essential for a country to be known as the developed country, as the literacy rate will increase and will contribute to the country's economy. Therefore, the country should have ample institutions for the students that provide quality education to them. Governing bodies like NAAC, NBA, etc. have certified the educational institutions based on various parameters. The external quality assurances play a significant role in the certification of the institutions by assessing the quality system of the institutions (Reddy, and Andrade, 2010). These would help the institutions to improve their educational system and scope to internationalize various educational areas for a better and bright future. The primary aim of the study is to understand and compare the Indian quality assurance models and parameters of accreditation in higher education with international standards. Hence, to achieve the primary objectives of the study, the following secondary objectives have been developed:

- To compare the quality assurance parameters of India with ABET criteria
- To compare the NBA parameters and system with other international accreditation agencies

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- To propose a quality assurance framework model for Indian engineering education

2. Literature Review

2.1 The scenario of Higher education in India

India is one of the developed countries; wherewith the growing demand of the higher studies in the middle-class community is increasing with the passing time. There is a need for higher education in the country for the growth of Indian economy to fulfill every dimension concerned with the requirements of higher education. The higher education in a country needs to be flexible, inclusiveness, integration and openness are essential factors on which the higher education of the country depends and utilize the available advancement of technological resources (Thanuskodi, 2011). Hence, the schools and colleges in India face many issues and challenges for providing higher education to the people in the country. Text

- According to a report, the gross enrolment ratio (GER) is meagre in India compared to the other countries, comprising only 15%. This situation can occur as compared to the increasing population in India. There are failing schools and colleges.
- The shortage of faculty members is another issue faced by the higher education system in India because there are students with higher qualification who do not get a job due to the inconsistency of educational system in India.
- The political interference in the educational system in India has been considered as one of the most significant issues faced by the students as the politicians who are connected with the students, manipulate them and use them for their meant purposes.
- Most of the colleges and universities in India are centralized and bureaucratic, which shows a lack of transparency, accountability and professionalism, affecting the main objective as the focus gets diluted.

Despite the above challenges, there are significant opportunities for the higher education system in India and scope of contributing to the Indian economy. Hence, by adopting advanced tools and techniques, colleges and universities can provide a high level of education. Additionally, by attracting foreign

investments and internationalizing a few research areas will reduce brain drain and develop the quality of education in India (Sheikh, 2017).

2.1 Quality Analysis in Higher Education

In India, the educational sector is enormous; many numbers of colleges and universities eagerly provide education to the students. However, the quality of education might have differed among educational institutions. Hence, according to Attar, Kumbhar, and Kulkarni, (2016), the quality of education can be analyzed through different stages of quality control, quality assurance, quality audit, and quality assessment. INQAAHE is an association with a different organization that looks for quality assurance in higher education at the international level.

Quality Control: Quality control refers to checking the quality of education provided by the colleges and universities in India. Hence, for the different field of study, there are allotted councils who often visit the universities and colleges to inspect whether the institutions use the right tools and techniques, approaches to deliver knowledge.

Quality Assurance: The quality assurance is the broader approach which is an essential tool of assessing the quality of education in the institutions. While assessing the quality assurance in the educational institutions, it involves everyone in the institution from the top management to the substantial personnel for ensuring that they are providing quality education.

2.1 Quality Assurance Parameters of NBA & NAAC

The quality assurance of the institutions mostly measured by the NBA and NAAC is based on ISO17021, which fulfils the requirements of the accreditation bodies (Dotong and Laguador, 2015). The quality assurance parameters of NBA & NAAC are:

Interdependence, Integrity: NAAC and NBA are mostly free from the financial, commercial, and other pressure. Also, the confidentiality of the information of the colleges and universities need to be maintained.

Quality System: The quality system needs to be documented, where all the details of the entity, procedure and feedback will be written.

Equipment: The universities and colleges need to have all the equipment and tools that are necessary to have for the concerning field of study provided by the colleges.

Administrative Requirement: The institutions should have their independent audited accounts, fulfilling all the legal requirements and having documented functions and technologies of the institutions.

Documentation: For quality assurance, the accreditation body has written policies and regulations that are needed to be maintained by the institutions in India.

Personnel: The institution must have qualified and expert faculties from the industry who might have adequate knowledge to deliver the students. The educational institutions must have documented and certified training systems.

Complaints and Appeal: The students' complaints and questions about the certification of the college needs to be documented (Dey, 2011). Additionally, the institutions should have the ability to answer all the queries written to the clients.

Management: Proper management is very much required to maintain the hierarchy and the institutional procedure.

Based on the above parameters, the certification bodies assess the quality system of the institutions in India and ensure eligibility for the certification.

2.1 Comparison of Accreditation Agencies in India with other Global Agencies

Accreditation is the linkage between the educational institution and the agency or association mostly to analyze the quality or the standard or the education provided by the different educational institute (Eaton, 2010). According to Marginson, (2010), to evaluate the quality of the education in higher education level, All India Council for Technical Education (AICTE) has created different boards of studies to monitor the standards in the educational institution whereas, the Association for Engineering Education of Russia (AEER) has identified the resource as programme educational objectives, faculty and programme resources. On the contrary, the Engineering Council of the United

Kingdom (ENGC) has specified the parameters as human and physical material and entry to the programme. It is to be noted that the assessment evaluation in ENGC evolves through the assessment strategies, professional registration of staff, quality assurance arrangements etc. and on the other hand the AEER the entire process was considered as a thorough examination system (Daily, Farewell and Kumar, 2010). The Engineer Ireland (E.U.) have inputs that are quite different from others like building, laboratories, equipment, support staff, academic staff etc. and the assessment evaluation has been through students' performance. In comparison, the NBA has faculty contribution, technical support and educational programme objectives as the input as Accreditation Parameter.

3. Research Methodology

Research methodology refers to the path through which the researcher structures their problems and the way to present the data collected during the research period (Mackey, and Gass, 2015). To analyze the present research study which is based on the Comparison of Indian Quality Assurance Models and Accreditation Parameters of Higher Education with International standards, the quantitative research approach has been followed, and the data collection has been done by conducting the survey among faculty members from engineering and higher education.

3.1 Mapping of Quality Assurance parameters of India NBA with ABET

Higher education has been considered to expand the in-depth knowledge in order to develop the understanding level in a particular subject domain. It is also taken into account for an individual to enrich the intellectual powers and the contributions to society by investing more on higher education. According to the British Standard Institution (BSI), the quality has been treated as the features and characteristics of some particular service to satisfy some specified needs and requirements. The Mapping of ABET and NBA Accreditation have been presented in the table. For the mapping for ABET (Accreditation Board for Engineering and Technology), the inputs have been specified as the students, programme, educational objectives, faculty and facility and presented column-wise. For the NBA (National Board of Accreditation), the parameters have been chosen as Institutional vision and mission, programme outcome

and curriculum, students' performance, faculty contribution, facilities and technological support, academic support units and teaching-learning process, governance and the institutional, financial support and constitutional evolution of the outcomes and presented row-wise. Some data analysis on the local needs, institute's vision, students' interest, programme outcome, etc. will be focussed for a better analysis.

3.2 Mapping of Quality parameters of India NBA with other International accreditation Bodies like AEER, E.U., E.A. and JABEE

For mapping the quality parameter of India NBA with the other international accreditation bodies like Association for engineering Education of Russia (AEER), Engineers Ireland (EU), Engineers Australia (EA) and Japan accreditation Board for Engineering (JABEE), the process will be presented in mapping of Quality Assurance Parameters of NBA with ABET and secondly Comparing the Quality Parameters of NBA with other international Accreditation agencies. The mutual data analysis will be done resembling with the Indian educational system and the comparison will be implemented in detail (Table 1). For the NBA (National Board of Accreditation) the parameter has been chosen as Institutional vision and mission, programme outcome and curriculum, students' performance, faculty contribution, facilities and technological support, academic support units and teaching-learning process, governance and the institutional, financial support and constitutional evolution of the outcomes etc. The parameter for the other international bodies has been specified for example, AEER Association for engineering

Education of Russia, the input has been identified as Programme educational objectives, faculty, programme resources and the evaluation and the assessments are through examination system. In the contrary for the EU the input has been specified as Building, laboratories, equipment, support and academic staff etc and the assessment evaluation has been done through student performance. For the JABEE and EA, the recourses have been identified as process of admission, faculty and educational supports and funding facilities, physical resources and academic and support staff profile respectively. For the JABEE assessment evaluation has been done through self-review of education, continuous

improvements and achievement of learning outcomes whereas, The EA assessment of evaluation revolves around Engagement with external stakeholders, Feedback and stakeholder input to continuous improvement processes, Processes for setting and

Table 1: Mapping of NBA with other International agencies Accreditation Criteria

S l o	International Accreditation Agencies Criteria	NBA (India) Criteria									
		1. Vision, Mission and Program Educational Objectives	2. Program Curriculum and Teaching – Learning Processes	3. Course Outcomes and Program Outcomes	4. Students' Performance	5. Faculty Information and Contributions	6. Facilities and Technical Support	7. Continuous Improvement	8. First Year Academics	9. Student Support Systems	10. Governance, Institutional Support and Financial Resources
1	Accreditation Board for Engineering and Technology (ABET)										
	Students									X	
	Program educational objectives	X									
	Faculty					X					
	Facility						X				
	Continuous Improvement							X			
	Institutional Support										X
	Student Outcomes			X							
	Curriculum		X								
2	Association for Engineering Education of Russia (AEER)										
	Program educational objectives	X									
	Faculty					X					

	Programme resources						X													
	Programme content		X																	
	Educational process																			
	Examination System			X																
	Professional qualification				X															
3	Engineering Council, United Kingdom (ENGC)	1	2	3	4	5	6	7	8	9	10									
	Human, physical and material resources						X													
	Entry to the programme								X											
	Teaching & Learning Process		X																	
	Internal regulations & progression																			X
	Implementation of previous accreditation recommendations and requirements							X												
	Learning outcomes of the programme			X																
4	Engineers Ireland (E.U.)																			
	Buildings, Laboratories and Equipment						X													
	Academic staff					X														
	Support staff										X									
	Governance																			X
	Assessment of Student performance				X															
	Programme outcomes			X																
5	Institute of Engineering Education Taiwan (IET)																			
	Program Educational Objectives	X																		
	Students				X															
	Faculty					X														
	Space & Facility						X													
	Curriculum		X																	

	Institutional support																			X
	Continuous improvement											X								
	Programme outcomes							X												
6	Japan Accreditation Board for Engineering (JABEE)	1	2	3	4	5	6	7	8	9	10									
	Process of admission																	X		
	Faculty																			
	Educational Environment and Students Support											X								
	Educational method							X												
	Implementation of Learning & Education							X												
	Achievement of Learning Outcomes								X											
	Continuous Improvement																X			
	Learning Outcomes																			
	Self-review of Education																			X

reviewing the educational outcomes specification Approach to assessment and performance evaluation Management of alternative implementation pathways and delivery modes, Approval processes for program development and amendment Benchmarking, Dissemination etc.

3.3 Statistical Analysis

In this present study, the descriptive statistics have been calculated using the SPSS for analyzing the parameters of the survey (Bryman, and Cramer, 2011) tool. Evaluation of Quality Assurance Parameters for Engineering Education will be taken into consideration, and the analysis has been done using the mean value and the standard deviation mostly. In order to test the hypothesis formulated to address the specific objective of the study, one sample T-test was applied by using SPSS. The T value corresponding to the mean difference has been measured in order to test and ultimately, the P-value has been taken into consideration in order to accept or reject the null hypothesis.

4. Findings and Discussion

Due to globalization, the importance of higher

education and the factors responsible for development need for higher education worldwide. From the collected data, it has been observed that the student's admission policies and the regulation have higher mean value and standard deviation as compared to the admission of the students from the other countries. The higher the standard deviation, the higher will be the spread of the data surrounding mean value. The results also indicated that creativity has a higher mean value and standard deviation than extended learning.

The one-sample T-test using SPSS (Table 6) has been done to test the hypothesis. The hypothesis one is presented to analyze the factors related to the quality, and the expected learning outcomes of engineering courses in India and abroad vary based on the faculty competencies and the institution type. The result of the T-test revealed that, the p-value <0.05 which indicates the rejection of the null hypothesis, i.e. that quality and expected learning outcomes of engineering courses in India and abroad do not vary based on the faculty competencies and institution type and after accepting the three sub alternative hypothesis it can be concluded that the quality and expected to learn outcomes of engineering courses in India and abroad vary based on the educational qualifications of their faculty members, years of experience of their faculty members and core competencies of their faculty member.

The testing results of the second hypothesis revealed that there exist no differences in the factors influencing the quality of Engineering courses in India and abroad. However, the individual one sample T-test for the four alternative sub hypothesis revealed that the P-value was found to be less than 0.05 which indicates to reject the null hypothesis and accept the four alternative sub hypothesis and also conclude that the quality of Engineering courses in India and abroad differs based on four factors like the effect of resources (student, faculty and infrastructure), the effect of education management, the effect of instructional planning and delivery and the effect of assessment and evaluation methods.

The third null hypothesis consists of testing the factors that the student learning outcomes and skill-set requirements of the Engineering courses in India are not in contrast with the applicable requirements of such courses internationally. To test this against the one alternative hypothesis which revealed that the student learning outcomes and skill-set requirements

of the Engineering courses in India are in contrast with the relevant requirements of such courses internationally. The four-sub hypotheses have been formed to support this alternative hypothesis. After testing with the one-sample and t-test for the individual influencing factors, it has been found that the p-value estimated is $0.000 < 0.05$ for all of the four testing results. This result indicates to reject the null hypothesis and accept the alternative hypothesis, i.e. the student learning outcomes, the expected learning requirements, the professional attributes, the skill set requirements for the Engineering courses in India to vary from those in the higher institutions abroad.

4.1 Descriptive statistics

Table 2: Quality Parameters for Resource Management

	N	Min.	Max	Mean	Std. Deviation
Students					
Students Admission Policies and regulation	30	2	5	4.40	.855
Student Counselling & Advising Services	30	2	5	4.27	.785
Students Contribution to cultural & Economic development	30	2	5	4.10	.923
Alumni interaction & support	30	2	5	4.13	.937
Admission of Students from other countries	30	1	5	3.23	1.040
Faculty					
Academic and professional qualifications	30	3	5	4.47	.776
Teaching ability and experience	30	3	5	4.43	.728
Supervision of student's research	30	3	5	4.27	.691
Innovations and patents	30	2	5	3.80	.887
Consultancy Projects are undertaken	30	1	5	3.40	1.037
Quality of publications	30	2	5	3.97	.964
Faculty- Student ratio	30	3	5	4.37	.615
Placement - Facilitating Job Opportunities	30	1	5	3.83	1.147
Professional Practices	30	1	5	4.10	.995

Participation in the Organizational Activities	30	2	5	3.73	.944
Membership of professional bodies	30	1	5	3.30	.952
Social Responsibility	30	2	5	4.17	.950
Infrastructure					
Classrooms, offices, laboratories, and associated equipment	30	3	5	4.70	.535
Modern tools, equipment, computing resources	30	2	5	4.43	.858
Library Services & e-Resources	30	1	5	4.50	.861
Technical Support	30	3	5	4.53	.629

Table 3: Quality Parameters for Education Management

	N	Min.	Max	Mean	Std. Deviation
Institutional Vision & Mission	30	3	5	4.50	.572
Management Support for Infrastructure Facilitation	30	4	5	4.60	.498
Finance and Management	30	3	5	4.47	.629
Governance & Institutional support	30	1	5	4.17	.950
Education Environment	30	3	5	4.60	.563
Continuous improvement	30	3	5	4.57	.626
Quality Management	30	4	5	4.57	.504

Table 4: Quality Parameters for Instructional Planning & Delivery

	N	Min.	Max	Mean	Std. Deviation
Curriculum Content					
Approach & Methodology for Qualifying Curriculum Content	30	4	5	4.47	.507
Programme Structure and Content	30	3	5	4.40	.563
Student-centred learning environment	30	3	5	4.30	.750
Flexible curriculum]	30	2	5	3.97	.890
Disciplines and cross-disciplinary modules	30	1	5	3.90	1.125
Complementary Studies	30	1	5	3.40	1.102

Educational Methods	30	2	5	4.27	.828
Teaching Process	30	3	5	4.33	.711
Learning Process	30	3	5	4.47	.730
Research projects	30	2	5	4.20	.887
Assessment & Evaluation					
Students Performance Evaluation	30	3	5	4.27	.740
Examination System	30	2	5	3.63	1.098
Assessment Strategies	30	2	5	4.10	.845
Development plan for Under performers	30	2	5	4.27	.740
Achievement of Learning Outcomes	30	2	5	4.17	.913
Learning Outcomes					
Ability to apply knowledge	30	3	5	4.67	.661
Ability to design and conduct experiment	30	3	5	4.33	.711
Ability to design a system	30	2	5	4.10	.885
Knowledge of contemporary issues	30	2	5	4.23	.774
Professional qualifications	30	2	5	3.93	.785
Results of outcome assessment	30	1	5	3.87	.973
Programme Outcomes	30	1	5	4.07	1.048
Discipline based criteria	30	2	5	4.13	.900

Table 5: Quality Parameters for Graduate Attributes

	N	Min	Max	Mean	Std. Deviation
Decision Making	30	3	5	4.27	.691
Practical Approach	30	3	5	4.43	.626
Ethical consideration	30	2	5	4.17	.874
Team Work	30	3	5	4.37	.718
Quality Appreciation	30	2	5	4.30	.750
Entrepreneurship	30	1	5	3.67	1.061
Negotiation skills	30	2	5	3.73	.907
Research and personal development	30	3	5	4.20	.664
Industry interaction	30	3	5	4.17	.747

Economic, social and environmental knowledge	30	3	5	4.13	.730
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Table 6: One-Sample Test for Quality Parameters

	Test Value = 3					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Resources [Students, Faculty & Infrastructure]	16.007	29	.000	1.20000	1.0467	1.3533
Education Management	21.970	29	.000	1.49524	1.3560	1.6344
Curriculum Content & Quality [Developing ability to plan]	9.633	29	.000	1.333	1.05	1.62
Curriculum Content & Quality [Examination System]	3.159	29	.004	.633	.22	1.04
Curriculum Content & Quality [Achievement of Learning Outcomes]	7.000	29	.000	1.167	.83	1.51

Curriculum Content & Quality [Student-centred learning environment]	9.497	29	.000	1.300	1.02	1.58
Graduate Attributes	12.662	29	.000	1.14333	.9587	1.3280

From the following table 2, we can observe that statement "Students Admission Policies and regulation" had a high mean value of 4.4 with a standard deviation of 0.855 and statement "Admission of Students from other countries" had a low mean value of 3.23 with a standard deviation of 1.04. For the faculty, the "Academic and professional qualifications" had a high mean value of 4.47 with a standard deviation of 0.776.

From the following table 3, we can observe that statement "Management Support for Infrastructure Facilitation " had a high mean value of 4.60 with a



Fig. 1: Quality Assurance Framework

standard deviation of 0.498. The table 4 highlights “Approach & Methodology for Qualifying Curriculum” with high mean value of 4.47 and standard deviation of 0.507. The “Students Performance Evaluation” scores high mean value of 4.27 and standard deviation 0.740. From the following table 5, we can observe that statement " Practical Approach " had a high mean value of 4.43 with a standard deviation of 0.626.

Significance of the Study

To improve the theoretical as well as the practical implications of the study, other necessary areas that prevent higher education need to be analysed. However, there are motives and loopholes; governing bodies overlook, and intervention of the political parties need to be restricted for the growth of the educational industry. Therefore, there is a need to improve and adopt a transformational approach for the higher educational level. The government should promote and increase collaboration between the Indian higher educational institutes with the international institutes and need to develop a strong quality assurance model as shown in the figure 1.

4. Conclusion

To summarise the discussion, it can be said that the quality and expected learning outcomes of engineering courses in India and abroad vary based on faculty competencies and institution type. There also exist dissimilarities in the factors influencing the quality of engineering courses in India and abroad. It can be concluded by analysing the entire data that the student learning outcomes and skill-set requirements of the engineering courses in India are in contrast with the relevant requirements of such courses internationally. It is recommended that essential efforts need to be exercised by the institutes to supervise international level initiatives and to ensure that the quality is integral to the institutional environment. The quality assurance system facilitates performance excellence and total quality management should be followed for measuring the efficiency of the quality framework followed. Promising and sustaining quality is constant teamwork where standards, parameters, and quality audit acts as a noteworthy integrated part. Quality assurance should be employed internally even though it is usually monitored and evaluated by an external agency for accreditation.

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