

**QUALITY ISSUES IN ENGINEERING INSTITUTIONS  
IN INDIA-STRATEGIES AND IMPROVEMENT**

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IN INDIA-STRATEGIES AND IMPROVEMENT**

by

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*to the*



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## **CERTIFICATE**

This is to certify that the thesis entitled “**Quality Issues in Engineering Institutions in India- Strategies and Improvement**” being submitted by **Sheo Shanker Prasad (2007IDZ8204)** to the Indian Institute of Technology Delhi for the award of **Doctor of Philosophy** in IDDC is a record of the original bonafide research work carried out by him under my guidance and supervision. The research reports and results presented in his thesis have not been submitted in parts or in full to any other University or Institution for the award of any degree or diploma.

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Date:

(Sheo Shanker Prasad)

## **ABSTRACT**

Quality is a key driver of any tangible or intangible product. A good quality education is one that provides all kinds of learners with capabilities which are required to become economically productive develop sustainable livelihoods, contribute to peaceful and democratic societies and enhance individual well-beings. Higher Education i.e. Engineering Education provided by Engineering Institutions through primary, secondary and higher secondary institutions comes into a category of intangible service product. If services or education provided by educational institutions, particularly higher educational institutions is of a specified level it is called a quality education and people rush towards such institutions.

In this thesis entitled, “Quality Issues of Engineering Institutions in India- Strategies and Improvement”, quality issues of engineering institutions have been discussed. It is a survey based thesis where the results are based upon statistical analysis of surveyed data of associated customers of engineering institutions mostly situated in Bihar and focus group meetings. Three customers’ students, faculties and industries have been identified on the basis of literature surveys. The quality issues (variables) have been identified and classified as per requirements and design characteristics of customers. The three sets of questionnaires have been generated for requirements and design characteristics of students, faculties and industries and three sets of questionnaires for their gap between perception and expectation. Three sets of questionnaires for each focus group of students, faculties and industries/employers for requirements and design characteristics respectively. The analysis has been done with the help of SPSS and MS Excel 2007 software after collection and compilation of data. The different statistical tools such as Univariate, Multivariate, one way ANOVA, Post-Hoc analysis

and T-test for analysis of data and hypothesis testing. Quality function deployment (QFD) has been used to address the voice of customers from the data of the focus groups. The seven variables of students and faculties and industries have been identified on the basis of their mean value. The regression was performed assuming that quality is a dependent variable and are the endogenous variables independent by assuming there is no correlation. The value of Cronbach's alpha indicates that data are for further analysis. The analysis indicates that the quality of education will enhance if the variables to address the grievances, adequate number of technical and administrative staffs, basic infrastructure, appropriate class room procedures and the faculty teaching ability and skill, adequate academic resources will be taken into account from the prospective point of view of the students. Similarly facilities for faculties such as adequate academic resources, adequate infrastructure and physical facilities, proper class room procedure, recognition of the work done by faculties and staffs at institutes, effective monitoring and evaluation system, cordial environment and relation among people and politeness and courtesy among staffs, students, and faculties and for entering into industries, the teaching expertise reflected by students, flexibility of knowledge reflected by students, risk taking ability reflected by students, requisite infrastructures for conducting interview by the institutions and talents shown in group discussion for placement, decision making ability reflected by students, facilities of imparting ethics and morality reflected, visually hygienic and appealing environment have been discussed. The thesis consists of eight chapters in addition to references and questionnaires. The first chapter deals with background of the thesis where as the last chapter deals with findings, conclusions and suggestions for future work.

## सार

गुणवत्ता किसी भी मूर्त या अमूर्त उत्पाद का एक प्रमुख चालक है। एक अच्छी गुणवत्ता वाली शिक्षा वह है जो सभी प्रकार के शिक्षार्थियों को क्षमताओं के साथ प्रदान करती है जिन्हें आर्थिक रूप से उत्पादक बनने की आवश्यकता होती है, जो स्थायी आजीविका विकसित करते हैं, शांतिपूर्ण और लोकतांत्रिक समाजों में योगदान देते हैं और व्यक्तिगत कल्याण को बढ़ाते हैं। उच्च शिक्षा यानी प्राथमिक, माध्यमिक और उच्चतर माध्यमिक संस्थानों के माध्यम से इंजीनियरिंग संस्थानों द्वारा प्रदान की गई इंजीनियरिंग शिक्षा अमूर्त सेवा उत्पाद की एक श्रेणी में आती है। यदि शैक्षिक संस्थानों द्वारा प्रदान की जाने वाली सेवाएं या शिक्षा, विशेष रूप से उच्च शैक्षणिक संस्थान एक निर्दिष्ट स्तर के हैं तो इसे गुणवत्ता शिक्षा कहा जाता है और लोग ऐसे संस्थानों की ओर भागते हैं।

इस थीसिस में, "भारत में इंजीनियरिंग संस्थानों के गुणवत्ता मुद्दे- रणनीतियां और सुधार" के हकदार, इंजीनियरिंग संस्थानों के गुणवत्ता के मुद्दों पर चर्चा की गई है। यह एक सर्वेक्षण आधारित थीसिस है जहां परिणाम बिहार में स्थित इंजीनियरिंग संस्थानों के संबंधित ग्राहकों के सर्वेक्षण किए गए आंकड़ों के सांख्यिकीय आंकड़ों के सांख्यिकीय विश्लेषण पर आधारित होते हैं और समूह की बैठकों पर ध्यान केंद्रित करते हैं। साहित्य सर्वेक्षण के आधार पर तीन ग्राहकों के छात्रों, संकाय और उद्योगों की पहचान की गई है। ग्राहकों के आवश्यकताओं और डिजाइन विशेषताओं के अनुसार गुणवत्ता के मुद्दों (चर) की पहचान और वर्गीकृत किया गया है। प्रश्नावली के तीन सेट छात्रों, संकाय और उद्योगों की आवश्यकताओं और डिजाइन विशेषताओं और धारणाओं और अपेक्षाओं के बीच उनके अंतर के लिए प्रश्नावली के तीन सेट के लिए तैयार किए गए हैं। क्रमशः आवश्यकताओं और डिजाइन विशेषताओं के लिए छात्रों, संकाय और उद्योग / नियोक्ता के प्रत्येक फोकस समूह के लिए प्रश्नावली के तीन सेट। डेटा संग्रह और संकलन के बाद एसपीएसएस और एमएस एक्सेल 2007

सॉफ्टवेयर की मदद से विश्लेषण किया गया है। यूनिवर्सिट, मल्टीवायरेट, एक तरह से एनोवा, पोस्ट-होक विश्लेषण और डेटा और परिकल्पना परीक्षण के विश्लेषण के लिए टी-टेस्ट जैसे विभिन्न सांख्यिकीय उपकरण। फोकस समूहों के डेटा से ग्राहकों की आवाज को संबोधित करने के लिए गुणवत्ता फंक्शन परिनियोजन (क्यूएफडी) का उपयोग किया गया है। छात्रों और संकाय और उद्योगों के सात चर की पहचान उनके औसत मूल्य के आधार पर की गई है। प्रतिगमन यह मानते हुए किया गया था कि गुणवत्ता एक आश्रित चर है और यह मानकर स्वतंत्र अंतराल चर है कि कोई सहसंबंध नहीं है। क्रोनबाक के अल्फा का मूल्य इंगित करता है कि डेटा आगे विश्लेषण के लिए है। विश्लेषण से संकेत मिलता है कि यदि शिकायतों को संबोधित करने के लिए चर, तकनीकी और प्रशासनिक कर्मचारियों की पर्याप्त संख्या, बुनियादी ढांचा, उचित कक्षा कक्ष प्रक्रियाओं और संकाय शिक्षण क्षमता और कौशल, पर्याप्त शैक्षिक संसाधनों को ध्यान में रखा जाएगा, तो शिक्षा की गुणवत्ता में वृद्धि होगी। छात्रों के संभावित दृष्टिकोण। इसी प्रकार पर्याप्त अकादमिक संसाधनों, पर्याप्त बुनियादी ढांचे और शारीरिक सुविधाओं, उचित कक्षा कक्ष प्रक्रिया, संस्थानों में संकाय और कर्मचारियों द्वारा किए गए कार्यों की मान्यता, प्रभावी निगरानी और मूल्यांकन प्रणाली, सौहार्दपूर्ण वातावरण और लोगों के बीच संबंध और विनम्रता और सौजन्य जैसे संकाय की सुविधाएं कर्मचारी, छात्र, और संकाय और उद्योगों में प्रवेश करने के लिए, छात्रों द्वारा प्रतिबिंबित शिक्षण विशेषज्ञता, छात्रों द्वारा प्रतिबिंबित ज्ञान की लचीलापन, छात्रों द्वारा प्रतिबिंबित जोखिम लेने की क्षमता, संस्थानों द्वारा साक्षात्कार आयोजित करने के लिए आवश्यक बुनियादी ढांचे और प्लेसमेंट के लिए समूह चर्चा में दिखाए गए प्रतिभा, छात्रों द्वारा प्रतिबिंबित निर्णय लेने की क्षमता, नैतिकता प्रदान करने की सुविधाएं और नैतिकता परिलक्षित, दृष्टि से स्वच्छ और आकर्षक वातावरण पर चर्चा की गई है। थीसिस में संदर्भ और प्रश्नावली के अलावा आठ अध्याय होते हैं। पहला अध्याय थीसिस की पृष्ठभूमि से संबंधित है जहां अंतिम अध्याय भविष्य के काम के लिए निष्कर्ष, निष्कर्ष और सुझावों से संबंधित है।

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## LIST OF ABBREVIATIONS

$\alpha$	Alpha
$\chi^2$	Chi-square
R square	Coefficient of multiple determination
AGFI	Adjusted Goodness-of-fit
AICTE	All India Council for Technical Education
ANOVA	Analysis of variance
AR	Absolute ranking
AHP	Analytical Hierarchy Process
df	Degree of Freedom
E	Expectation
ESR	Expectation of student requirement
ESD	Expectation of student design characteristic
EFR	Expectation of faculty requirement
EFD	Expectation of faculty design characteristics
EIR	Expectation of industry requirement
EID	Expectation of industry design characteristics
F	Faculty
GFI	Goodness-of-fit
Lev. Stat.	Levine's Statistic
$\mu$	Mean
P	Perception
Pearson's Corr	Pearson's correlation
PSR	Perception of student requirement
PSD	Perception of student design requirement

PFR	Perception of faculty requirement
PFD	Perception of faculty design requirement
PIR	Perception of industry requirement
PID	Perception of industry design requirement
QFD	Quality Function Deployment
R <sup>2</sup>	Regression Square
RR	Relative Ranking
SD	Student Design Characteristics
SERVQUAL	Service Quality
Sig	Significance
SR	Student Requirement
SPSS	Structural Package for Social Sciences
TQM	Total Quality Management
UGC	University Grants Commission