BRAND BUILDING PERSPECTIVE AMONG ENGINEERING COLLEGES USING TQM TOOLS

Dr. Chitra Sivasubramanian
Associate Professor
Department of Management Studies, School of Management
Pondicherry University

Ms. P. Rupha Rani
Research Scholar (Full Time)
Department of Management Studies, School of Management
Pondicherry University

ABSTRACT

Quality of engineering education is the skill of building the abilities of assimilating the knowledge in the area of educational needs and the implementation of this knowledge to creating mechanisms allowing fulfilling expectations of customers and educational services. One should distinguish pupils, students, teachers and employers among the people who are interested in the quality of education.

Quality in engineering educational process is understood as the agreement with settled requirements or the degree of the fulfillment of stakeholders’ requirements or other interested sides, or also the degree of the fulfillment of the settled assessment criteria (e.g. to didactic tools, lecturers, the results of teaching, needs, satisfaction etc.). Engineering educational process should also take into account that knowledge, which graduates leaving institutes have at present, becomes worthless very quickly. It is important to shape students’ skill of self-learning and additional studying in the educational process. Helpful in this is undertaking activities serving to the reconstruction the students own motivation to gaining the knowledge and skills. Teachers should have the consciousness of the role, which they have to fulfill in the realization of this aim.

In this context, the technical institutes in Tamil Nadu are currently facing a stiff competition because of opening of the off-shore campus of foreign universities and diminishing public funding. Highly competitive environment makes quality as a key competitive weapon for attracting primary customers (students). Therefore, the challenges ahead of technical institutions necessitate reassessing the brand equity and market positioning through sufficient control to follow the quality standards of education. The quality of education comprises various dimensions related to system level factors and improvement upon these dimensions may enable an institution to become an efficient one.

The big difference in quality of engineering education leads to an elitist mentality. As institutions attain success, some become wrapped up in their reputation, and lose focus on real accomplishments. This attitude rubs off to students graduating from such institutions. Often,
applicants who gain admission into any of the top institutions, tend to view themselves in elitist terms, and enact behavior such as looking down at those from second tier institutions. However, considering that most of their colleagues in their workplace will have degrees from less prestigious institutions, such an attitude will come in the way of teamwork that is becoming increasingly important in organizations today. A focus on real accomplishments rather than taking refuge in belonging to an elite group is likely to make these graduates more effective. On this perspective research tone was set and suggestions are made towards it.

Key Words: TQM, Quality, Engineering Education, Stake Holders

1.0 INTRODUCTION

1.1. Importance of Technical Education

Amongst many service sectors, technical educational sector plays a pivotal role for socio economic development in any country since it deals with knowledge development and dissemination, technology transfer and collaborative works with industries. The demand and opportunities in technical educational sector resulted in mushrooming growth in number of technical institutes especially in the developing countries like India.

The Indian technical educational system has been subjected to fast, radical and even revolutionary change over recent years. Indeed, this change is still in progress. Vitality of technical education is facing a considerable amount of uncertainty and is significantly impacted by the general changes to global economics and to the resulting social and cultural change that results.

Since technical education determines the development and socio-economic condition of a nation, there is a greater need for high quality technical education to produce technically skilled manpower in India. A high quality technician can obviously be created only through high quality technical and vocational teaching and training. If India wants to raise the standard of its economy to that of economy of developed nations such as USA, UK, France, Germany and Japan, it should move forward.

The history of imparting formal technical education in India can be traced back to mid 19th century, although it got momentum in 20th century. Since Independence in 1947, the Technical Education System has grown into a fairly large-sized system, offering opportunities for education and training in a wide variety of trades and disciplines and had become a major concern for the Government of India to face the new challenges and move the country forward. The system capacity increased very rapidly with the major role being played by the private sector and India now has the second largest number of technical students in the world.

Some of the industrially developed states such as Maharastra, Karnataka, Tamil Nadu and Andra Pradesh have experienced phenomenal growth both in numbers of students and technical institutions over the last two decades. There are technical institutes and colleges that are supported by the State and Central governments and also a large number of private technical colleges and institutes that provide technical education in India.

1.2. Engineering Education in India

The concept of engineering education through formal instruction in a school or college was unknown at that time even in England. Consequently, the subjects of engineering were not properly classified and structured for teaching. The teachers of Roorkee College within the first 25 years of its inception did the pioneering work in systematizing the teaching of engineering and preparing education material. The printing press of the college played a great role in publishing 17 College Manuals and three volumes of *Roorkee Treatise on Civil Engineering in India*, which became standard texts in other engineering colleges.
1.2.1. Role of Military Engineers in Engineering Education

The Royal Engineers in the Army in India played a major role in influencing the fortune of Roorkee College and the three other colleges in Kolkata, Mumbai and Chennai. Military engineers were the only type of engineers that came to India with the East India Company. As the Company assumed greater power for governing the country, all technical jobs in engineering and science were entrusted to military engineers. Almost all the Public Work Department (PWD) officers came from this tribe and engineering education came under their purview. The principals and teachers of these colleges were also army engineers. These men ensured that military was the feeder for admission to these colleges and the colleges in turn served the army by running special courses for its officers and other ranks.

1.2.2. The Institution of Universities

On the recommendation of the Court of Directors of the East India Company, Universities of Calcutta, Madras and Bombay were established in 1857 with a comprehensive academic scope. They established faculties of arts, science and law as well as of medicine and engineering. The three provincial engineering colleges were duly affiliated to the University of their Region, but the graduates started receiving university degrees from 1864 onwards.

![Figure-1.1. Schematic of Inputs and Outputs for Engineering Education](image)

1.3. Private Initiatives

Technical education has always been and continues to be one of the more preferred areas of study with expectations for better career opportunities. During the last two decades, the growing demand for expansion of technical education and the inability of the Government (which traditionally has been establishing and running technical institutions), to meet the social aspirations, has resulted in private initiative to provide the alternatives. In recent years, private registered societies and trusts have established a phenomenally large number of technical institutions.

The self financing technical institutions now account for more than two-third of the admissions to engineering colleges and nearly half in polytechnics. According to the AICTE the intake in degree and diploma courses in engineering at the time of
Independence. There is a significant imbalance in the geographical spread of technical education.

There are Engineering Institutes and Colleges that are supported by the state and central governments, and also a large number of private Engineering Colleges that provide technical education in India. The number of private institutions, mostly self-financing, is increasing rapidly. Since more than 60 per cent of these Colleges are concentrated in four southern states, (Tamil Nadu, Karnataka, Andhra Pradesh and Maharashtra) this is a lop-sided expansion.

In the small southernmost state of Kerala alone the increase is from about a dozen to more than seven dozen Engineering Colleges, in a short span of three years. As a result of this proliferation, the country experiences an acute shortage of senior faculty, lack of critical mass of students, (in several institutions) needed for sustainable growth and market access to Engineering education sector, leading to corporate control of curriculum content and economic utilitarianism in the choice of courses and subjects.

1.4. Engineering Education in Tamil Nadu

Tamil Nadu gets its pride from the fact that the first Engineering institution to come into being in the country was the Survey School established in 1794 at Madras by the East India Company. The Engineering Colleges and Polytechnics were under the control of the Directorate of Public Instruction and the Directorate of Industries and Commerce respectively.

Tamil Nadu prides from the fact that the first engineering institution to come into being in the country was the Survey School established in 1794 at Madras by the East India Company. Out of this it grew as reputed College of Engineering, Guindy, and Chennai. Today Tamil Nadu has success in developing its educational infrastructure and potential. Chennai has the best technological universities of the world including the Indian Institute of Technology-Madras, and Anna University. Anna University is a unitary type of university promoting study and research in the field of engineering, technology and applied sciences.

1.4.1. College of Engineering, Guindy (CEG)

The College of Engineering, Guindy (CEG) is one of the premier institutes of Technical education in India. Established in the year 1794, it boasts of an illustrious history in training and grooming talented young minds from all over the country.

College of Engineering, Guindy (CEG) is one of the premier institutes of Technical education in India. Established in the year 1794, it boasts of an illustrious history in training and grooming talented young minds from all over the country. Owing to its high educational standards it has been consistently ranked among the top ten engineering colleges in India. Over its 217 year history, it has produced several brilliant engineers who have redefined the standards of technology in the country and the world. In keeping with its aim to foster innovation, CEG is renowned for the quality of research taking place under its fold.

1.4.2. Anna University

Anna University was established on 4th September 1978 as a unitary type of University. It offers higher education in Engineering, Technology and allied Sciences relevant to the current and projected needs of the society. Besides promoting research and disseminating knowledge gained there from, it fosters cooperation between the academic and industrial communities. The University was formed by bringing together and integrating two well-known technical institutions in the city of Madras.

College of Engineering, Guindy (CEG)(1794)

Madras Institute of Technology, Chrompet (MIT) (1949) and three Technological Departments of the University of Madras.
Alagappa College of Technology (ACT)(1944)
School of Architecture and Planning (SAP)(1957)

In December 2001, it was converted into an affiliating university, with almost all engineering colleges in the state of Tamil Nadu under its fold and also absorbing all the six government engineering colleges in Tamil Nadu as its constituent colleges.

In 2007-2010 it was been split into six universities, namely, Anna University, Chennai, Anna University of Technology, Chennai, Anna University of Technology, Tiruchirappalli, Anna University of Technology, Coimbatore, Anna University Tirunelveli and Anna University of Technology, Madurai. At present, there are 326 engineering colleges are under the Anna University.

1.5. Quality of Engineering Education

The students today, their engineering degree are an investment that requires them or their families to incur debt before graduating. With financial stakes increasing, even more importance is placed on the choice of institution and transforms student from a passive participant to an active consumer who is paying for quality education that promises a better career prospect after graduation. However, there are varying degrees of attitude as to what actually constitutes quality in engineering education by different groups of people.

Instead of providing education for a privileged few, engineering education has become more market-centered and international where many nations are making an education more broadly available in order to foster a knowledge economy. Finally, accreditation agencies place increasing importance on education providers to ensure progress to outcomes is measured and quality standards are met.

Amidst this climate of change, many engineering education institutions are examining their identity and looking for ways to improve their academic quality and reputation. Leadership vision and commitment are a catalyst in many organizational change models based on the total quality management paradigm. Change models start with the organization’s mission and vision, which is cascaded throughout the structure to align units in a common direction that insures effective implementation. If institution leadership attains a reputation for a high level of academic quality and excellence among stakeholders, then more high quality students are expected to enroll and employers that are more reputable will hire graduates of the institution.

The strong brands feature quality, uniqueness and spirit as well as consistency and symbolism in their communication. The institutional success depends critically upon developing skills in brand-building by using all of an institution’s particular assets to create unique entities that have a lasting personality. Brands without a personality have difficulties to establishing relationships with students and other relevant exchange partners. A strong brand personality represents the basis upon which relationships can be established and that this, subsequently will entice those who view personality as their ideal.

The benefits of a compelling brand identity in establishing a strong reputation in engineering education can be significant and long-term and increasingly, the use of branding in both domestic and international markets development indicates that globalization has reached the engineering education market.

Image or the public's perception of the institution, is a direct result of their experience and the associations they have with the institute and relates to the impression of quality and the attributes of the organization. An institution's identity can be the result of a strategically planned and purposeful presentation of itself in order to gain a positive image in the minds of the public and/or evolve over time as the institutionalized patterns and shared meanings attached to the history, identity and unique characteristics of the entity. The engineering education institutions can enhance their reputation through marketing, promotion, and branding programmes, there is debate over how changeable a institution's identity is if it is historically rooted in attitudes, beliefs and values that are deeply institutionalized.
Operationally, an institution’s identity is the visual presentation of itself, including but not limited to its name, logo, tagline, color palette and architecture. The institution's public behavior can influence the perceptions of stakeholders. The reputation of an institution relies on how students who experienced it feel about the quality of the education, teaching staff, library, and the location of the campus. Branding is essential to successful market differentiation, may involve the use of slogans and logos, but most importantly, should provide a common image that stakeholders can attach to as an expression of loyalty and be consistently maintained across the institution.

An institution’s image results from complex and multifaceted set of attributes that are processed by the individual from messages sent by the entity and these messages may be intentional or unintentional social, historical and personal experiences. Therefore, an institution’s reputation can result from two general sources that a stakeholder experiences: (1) information awareness that is communicated through various channels and (2) favorable (or unfavorable) contacts with the institution. Evidently, image is a function of market signals conveyed by the institution that stakeholders selectively process as well as their personal interactions and familiarity with the institution.

Quality Engineering Education is the development of intellectual skills and knowledge that will equip graduates to contribute to society through productive and satisfying engineering careers as innovators, decision-makers and leaders in the global economy of the twenty first century. Quality Engineering Education demands a process of continuous improvement of and dramatic innovation in student, employer and societal satisfaction by systematically and collectively evaluating and refining the system, practices and culture of engineering education institutions.

Quality of engineering teaching also affects the quality of graduates which, in turn, is affected by the level of staff capability in addition to the quality (and quantity) of equipment and support services, both influenced by the financial power of the institute. But, more financial power is gained through higher market share as well as the capability to absorb grants and funding which depends on the research effectiveness. The loop is closed when considering the fact that quality staff are normally more able to carry out more effective research. All the loops can have an opposite effect once one variable starts going wrong. The low quality graduates can lead to a poor reputation for the university, resulting in a worse situation for the quality of entrants and hence the graduates again.

2.0. OBJECTIVES

1. To examine the socio-economic characteristics of the stakeholders of the engineering institutions.
2. To identify the factors influencing the quality of engineering institutions.
3. To analyze the students, faculty and institutional features of engineering institutions.
4. To study the dimensions and attributes of image and sources for the image formation and its impact on brand preference for engineering institutions.
5. To suggest appropriate measures for brand image creation on different attributes of quality perception.

2.1. Hypotheses

1. There is no significant factor influencing the quality of engineering institutions.
2. There is no significant difference among students, staff and institutional features of engineering institutions.
3. There is no significant difference in dimensions and attributes of image and sources for the image formation in engineering institutions.
4. There is no significant difference in brand preferences of engineering institutions.
2.2. Need and Importance of the Study

The finding of the study would be useful for better understanding of the socio-economic conditions of different stakeholders of engineering education. The present study would help to identify important total quality management practices that affect the brand-building process of engineering colleges. It would be also useful to understand perceptions of stakeholders and opportunities and need for brand image building of engineering colleges.

The present study would be highly useful for formulating and implementing effective total quality management dimensions and strategies for sustainable development of brand image and it would improve the quality education delivery systems of engineering institutions.

3.0. DATA ANALYSIS & INTERPRETATION

Table- 3.1. Factor Analysis of Present & Past Students’ Selection of Engineering College

<table>
<thead>
<tr>
<th>Selection Criteria</th>
<th>Rotated Factor Loadings on Factor I</th>
<th>Factor II</th>
<th>Factor III</th>
<th>Factor IV</th>
<th>Factor V</th>
<th>Factor VI</th>
<th>Factor VII</th>
<th>Factor VIII</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of faculty and teaching</td>
<td>.690</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up-to-date facilities and classrooms</td>
<td>.652</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment opportunities/placement</td>
<td></td>
<td></td>
<td>.681</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Safe environment for women (not mixed)</td>
<td></td>
<td></td>
<td>.694</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opportunities for social activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regional college ranking</td>
<td></td>
<td></td>
<td>-.753</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attractive and appealing Web site</td>
<td></td>
<td></td>
<td>.575</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recruiter visit or contact</td>
<td></td>
<td></td>
<td>.588</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality of the programmes/academic excellence</td>
<td>-.503</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friends are also interested in the college</td>
<td></td>
<td></td>
<td></td>
<td>.858</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Availability of degrees and majors</td>
<td>.663</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal contact with college</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall reputation and prestige</td>
<td></td>
<td></td>
<td>-.594</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appearance of campus</td>
<td></td>
<td></td>
<td>.780</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Convenience of close to home</td>
<td></td>
<td></td>
<td>.789</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Favourable campus visit</td>
<td></td>
<td></td>
<td>.667</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advertising (newspaper, brochures)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.56</td>
</tr>
<tr>
<td>Recommendation of teachers or counselors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.819</td>
</tr>
<tr>
<td>Parents/family recommend the college</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.618</td>
</tr>
<tr>
<td>Opportunities for sports/extracurricular activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.541</td>
</tr>
<tr>
<td>Eigen Value</td>
<td>2.76</td>
<td>1.88</td>
<td>1.77</td>
<td>1.58</td>
<td>1.35</td>
<td>1.27</td>
<td>1.18</td>
<td>1.08</td>
</tr>
<tr>
<td>% of Variance</td>
<td>9.95</td>
<td>8.50</td>
<td>8.37</td>
<td>8.22</td>
<td>7.50</td>
<td>7.33</td>
<td>7.27</td>
<td>7.10</td>
</tr>
<tr>
<td>Cumulative % of Variance</td>
<td>9.95</td>
<td>18.45</td>
<td>26.82</td>
<td>35.04</td>
<td>42.54</td>
<td>49.87</td>
<td>57.14</td>
<td>64.24</td>
</tr>
</tbody>
</table>

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 9 iterations.
There are eight independent groups were extracted which account for a total of 64.24 per cent of variations on the 20 variables. The each of eight factors contributes 9.95 per cent, 8.50 per cent, 8.37 per cent, 8.22 per cent, 7.50 per cent, 7.33 per cent, 7.27 per cent and 7.10 per cent respectively. Factor-I: From the table, it is inferred that out of 20 selection criteria variables, three variables have their high, relatively tightly grouped factor loadings on factor-I. This factor consists of:

- Quality of faculty and teaching (0.69)
- Up-to-date facilities and classrooms (0.65)
- Advertising (newspaper, brochures) (0.56)

Hence, this factor is named as “QUALITY”.

Factor-II: is formed with:

- Quality of the programmes/academic excellence (-0.50)
- Availability of degrees and majors (0.66)
- Overall reputation and prestige(-0.78)

These variables are named as “VALUE”.

Factor-III: This factor includes:

- Safe environment for women (not mixed) (0.69)
- Opportunities for social activities (-0.75)
- Attractive and appealing Web site(0.67)

These three variables are named as “ATTRACTIVE”.

Factor-IV: This factor is formed with:

- Appearance of campus (0.79)
- Convenience of close to home (0.67)
- Opportunities for sports/extracurricular activities (0.54)

This factor is named as “COMFORTABLE”.

Factor-V: This factor includes:

- Employment opportunities/placement (0.68)
- Regional college ranking (-0.58)
- Recruiter visit or contact e(0.59)

The factor is named as “OPPORTUNITY”.

Factor-VI: This factor is formed with:

- Friends are also interested in the college (0.86)
- Personal contact with college (-0.59)
- Parents/family recommend the college(0.62)

This factor is named as “INFLUENCE”.

Factor-VII: This factor includes:

- Favourable campus visit (0.73)

The factor is named as “FAVOURATISM”.

Factor-VIII: This factor is formed with:

- Recommendation of teachers or counselors (0.82)

This factor is named as “RECOMMENDATION”.

65
Table- 3.2. Tests of Equality of Group Means among Parents & Employers

<table>
<thead>
<tr>
<th>Selection Criteria</th>
<th>Wilks' Lambda</th>
<th>F</th>
<th>df1</th>
<th>df2</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of faculty and teaching</td>
<td>.972</td>
<td>1.154</td>
<td>3</td>
<td>121</td>
<td>.330</td>
</tr>
<tr>
<td>Up-to-date facilities and classrooms</td>
<td>.921</td>
<td>3.480</td>
<td>3</td>
<td>121</td>
<td>.018</td>
</tr>
<tr>
<td>Employment opportunities/placement</td>
<td>.948</td>
<td>2.217</td>
<td>3</td>
<td>121</td>
<td>.100</td>
</tr>
<tr>
<td>Safe environment for women (not mixed)</td>
<td>.997</td>
<td>.136</td>
<td>3</td>
<td>121</td>
<td>.938</td>
</tr>
<tr>
<td>Opportunities for social activities</td>
<td>.987</td>
<td>.522</td>
<td>3</td>
<td>121</td>
<td>.668</td>
</tr>
<tr>
<td>Regional college ranking</td>
<td>.989</td>
<td>.453</td>
<td>3</td>
<td>121</td>
<td>.716</td>
</tr>
<tr>
<td>Attractive and appealing Web site</td>
<td>.942</td>
<td>2.501</td>
<td>3</td>
<td>121</td>
<td>.713</td>
</tr>
<tr>
<td>Recruiter visit or contact</td>
<td>.995</td>
<td>.200</td>
<td>3</td>
<td>121</td>
<td>.896</td>
</tr>
<tr>
<td>Quality of the programmes/academic excellence</td>
<td>.981</td>
<td>.774</td>
<td>3</td>
<td>121</td>
<td>.510</td>
</tr>
<tr>
<td>Parents/family recommend the college</td>
<td>.979</td>
<td>.885</td>
<td>3</td>
<td>121</td>
<td>.451</td>
</tr>
<tr>
<td>Availability of degrees and majors</td>
<td>.998</td>
<td>.065</td>
<td>3</td>
<td>121</td>
<td>.018</td>
</tr>
<tr>
<td>Personal contact with college</td>
<td>.969</td>
<td>1.297</td>
<td>3</td>
<td>121</td>
<td>.279</td>
</tr>
<tr>
<td>Overall reputation and prestige</td>
<td>.990</td>
<td>.403</td>
<td>3</td>
<td>121</td>
<td>.631</td>
</tr>
<tr>
<td>Appearance of campus</td>
<td>.985</td>
<td>.598</td>
<td>3</td>
<td>121</td>
<td>.617</td>
</tr>
<tr>
<td>Convenience of close to home</td>
<td>.977</td>
<td>.933</td>
<td>3</td>
<td>121</td>
<td>.427</td>
</tr>
<tr>
<td>Favourable campus visit</td>
<td>.997</td>
<td>.131</td>
<td>3</td>
<td>121</td>
<td>.942</td>
</tr>
<tr>
<td>Advertising (newspaper, brochures)</td>
<td>.965</td>
<td>1.468</td>
<td>3</td>
<td>121</td>
<td>.227</td>
</tr>
<tr>
<td>Recommendation of teachers or counselors</td>
<td>.998</td>
<td>.098</td>
<td>3</td>
<td>121</td>
<td>.961</td>
</tr>
<tr>
<td>Opportunities for sports/extracurricular activities</td>
<td>.952</td>
<td>2.022</td>
<td>3</td>
<td>121</td>
<td>.014</td>
</tr>
</tbody>
</table>

The F test is significant for five variables of up-to-date facilities and classrooms, employment opportunities/placement, availability of degrees and majors, overall reputation and prestige and opportunities for sports/extracurricular activities.

Table-3.3. Criteria for Selection of Engineering College among Faculty & Principal

<table>
<thead>
<tr>
<th>Selection Criteria</th>
<th>Weighted Mean</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good remuneration</td>
<td>4.81</td>
<td>Very Important</td>
</tr>
<tr>
<td>Up-to-date facilities and classrooms</td>
<td>3.78</td>
<td>Important</td>
</tr>
<tr>
<td>Promotion opportunities</td>
<td>4.68</td>
<td>Very Important</td>
</tr>
<tr>
<td>Safe environment</td>
<td>3.38</td>
<td>Neutral</td>
</tr>
<tr>
<td>Opportunities for social network</td>
<td>3.19</td>
<td>Neutral</td>
</tr>
<tr>
<td>Reputation</td>
<td>3.83</td>
<td>Important</td>
</tr>
<tr>
<td>Academic excellence</td>
<td>3.67</td>
<td>Important</td>
</tr>
<tr>
<td>Opportunities for continuous learning</td>
<td>3.71</td>
<td>Important</td>
</tr>
<tr>
<td>Appearance of college</td>
<td>3.78</td>
<td>Important</td>
</tr>
<tr>
<td>Good administration</td>
<td>3.83</td>
<td>Important</td>
</tr>
<tr>
<td>Convenience of close to home</td>
<td>2.88</td>
<td>Neutral</td>
</tr>
<tr>
<td>Recommendation of friends</td>
<td>3.74</td>
<td>Important</td>
</tr>
<tr>
<td>Trainings for skills and knowledge</td>
<td>4.85</td>
<td>Very Important</td>
</tr>
<tr>
<td>Encourage for innovation</td>
<td>4.79</td>
<td>Very Important</td>
</tr>
<tr>
<td>Information sharing</td>
<td>3.75</td>
<td>Important</td>
</tr>
<tr>
<td>Good working environment</td>
<td>3.82</td>
<td>Important</td>
</tr>
<tr>
<td>Job security</td>
<td>4.81</td>
<td>Very Important</td>
</tr>
<tr>
<td>Great scope for research activities</td>
<td>3.87</td>
<td>Important</td>
</tr>
<tr>
<td>Dynamic leadership</td>
<td>3.90</td>
<td>Important</td>
</tr>
<tr>
<td>Teamwork</td>
<td>3.84</td>
<td>Important</td>
</tr>
<tr>
<td>Commitment</td>
<td>3.99</td>
<td>Important</td>
</tr>
<tr>
<td>Motivation</td>
<td>3.87</td>
<td>Important</td>
</tr>
<tr>
<td>Professional treatment</td>
<td>3.81</td>
<td>Important</td>
</tr>
<tr>
<td>Behavior of students</td>
<td>2.94</td>
<td>Neutral</td>
</tr>
<tr>
<td>Inter-personal relationship among teachers</td>
<td>2.89</td>
<td>Neutral</td>
</tr>
<tr>
<td>Performance appraisal</td>
<td>4.02</td>
<td>Important</td>
</tr>
<tr>
<td>Good rewarding system</td>
<td>4.82</td>
<td>Very Important</td>
</tr>
</tbody>
</table>
The results show that good remuneration, promotion opportunities, trainings for skills and knowledge, encourage for innovation, job security and good rewarding system are very important criterion for selection of college by the faculty for engineering college.

The faculties are neutral with safe environment, opportunities for social network, convenience of close to home, behavior of students and inter-personal relationship among teachers.

The other criteria of up-to-date facilities and classrooms, reputation, academic excellence, opportunities for continuous learning, appearance of college, good administration and recommendation of friends are important as perceived by the faculty.

Besides, information sharing, good working environment, great scope for research activities, dynamic leadership, teamwork, commitment, motivation, professional treatment and performance appraisal are also important as perceived by the faculty.

4.0. FINDINGS

4.1. Students and Alumni

The factor analysis show that there are eight independent groups were extracted which account for a total of 64.24 per cent of variations on the 20 variables. The each of eight factors contributes 9.95 per cent, 8.50 per cent, 8.37 per cent, 8.22 per cent, 7.50 per cent, 7.33 per cent, 7.27 per cent and 7.10 per cent respectively and these factors are grouped in to quality, value, attractive, comfortable, opportunity, influence, favoritism and recommendation.

The discriminate analysis indicate that quality of faculty and teaching, employment opportunities/placement, recruiter visit or contact, quality of the programmes/academic excellence and overall reputation and prestige discriminate best among four branches of engineering. Based on the discriminant function, 60.80 per cent of the measures have been correctly classified.

The professionals’ opinion, professional performance, publicity through televisions, friends, exhibition and seminars and events are the major sources for image formation.

The results also show that ex-students’ opinion, ranking, existing students’ opinion, publicity through radio, opinion of teachers and advertisement in print media are also sources for image formation as perceived by the students of engineering colleges.

The correlation co-efficient shows that gender is positively significantly associated with branches and capitation fee at one per cent level of significance. The results also indicate that gender is negatively correlated with admission and total expenses per year at one per cent level of significance.

The correlation co-efficient indicate that branch is positively significantly correlated with total expenses per year at one per cent level of significance. The results also show that year is also positively associated with admission and friends at one per cent level of significance.

The age is positively significantly associated with existing students’ opinion and friends at one per cent level of significance. The correlation co-efficient indicate that admission is positively significantly associated with seminars and events at five per cent level of significance. The results also show that capitation fee is negatively correlated with seminars and events at five per cent level of significance.

The Edu QUAL (SERVQUAL) model show that there are nine independent groups were extracted which account for a total of 61.93 per cent of variations on the 44 variables. The each of nine factors contributes 11.41 per cent, 9.73 per cent, 8.40 per cent, 7.95 per cent, 6.55 per cent, 5.34 per cent, 4.84 per cent, 3.95 per cent and 3.76 per cent respectively and these factors are grouped in to training needs, infrastructure, quality, skills, effectiveness, interest, response, efficiency and adoption.

The results show that brand identity and brand reputation are very important for preference of college by the students while students are neutral with brand communication and institutional culture.
The results also indicate that brand personality, vision and mission, goals, administrative structure, educational ethos, awareness, recognition, experience, perceived quality, brand loyalty and brand association are also important for preference of college by the students. The results show that about 41.60 per cent of students felt that the image of college is good followed by ok (33.60 per cent) and very good (24.80 per cent).

The results indicate that about 44.80 per cent of students felt that the quality of education is satisfied followed by indifferent (29.60 per cent) and very satisfied (25.60 per cent).

The results show that the t-value for brand image-satisfaction of quality of education is 10.264 which is significant at one per cent level of significance. Hence, there is a significant difference exiting between brand image and satisfaction of quality of education in engineering colleges.

The multiple regression analysis indicates that the coefficient of multiple determination ($R^2$) is 0.69 indicating the regression model is moderately fit. The results show that brand personality, brand reputation and brand loyalty are positively influencing the brand image at one per cent level of significance, while awareness and recognition are also positively influencing the brand image of engineering college at one five cent level of significance.

4.2. Parents and Employers

The factor analysis show that there are ten independent groups were extracted which account for a total of 76.35 per cent of variations on the 20 variables. The each of ten factors contributes 8.86 per cent, 8.76 per cent, 8.33 per cent, 8.15 per cent, 8.03 per cent, 7.22 per cent, 6.90 per cent, 6.83 per cent, 6.71 per cent and 6.56 per cent respectively and these factors are grouped in to superior, favourable, career, image, recommendation, comfortable, exposure, academics, attractiveness and convenience.

The discriminant analysis indicates up-to-date facilities and classrooms, employment opportunities/placement, availability of degrees and majors, overall reputation and prestige and opportunities for sports/extracurricular activities discriminate best among four income groups. Based on the discriminant function, 79.20 per cent of the measures have been correctly classified. The professional performance, opinion of teachers, ranking, professionals’ opinion and publicity through televisions are the major sources for image formation.

The results also show that friends, seminars and events, exhibition, advertisement in print media and publicity through radio are also sources for image formation as perceived by the parents of students of engineering colleges.

The correlation co-efficient shows that occupation is positively significantly associated with monthly income at five per cent level of significance. The results also indicate that education is positively correlated with friends at five per cent level of significance.

The correlation co-efficient indicate that monthly income is positively significantly correlated with family size at five per cent level of significance. The results also show that family type is also negatively associated with family size at one per cent level of significance.

The family size is negatively significantly associated with seminars and events at one per cent level of significance. The correlation co-efficient indicate that admission is positively significantly associated with total expenses per year at one per cent level of significance while it is negatively significantly correlated with capitation fee at one per cent level of significance. The results also show that total expenses per year is positively correlated with capitation fee, professionals’ opinion and publicity through televisions at one per cent level of significance.

The Edu QUAL (SERVQUAL) model show that there are eleven independent groups were extracted which account for a total of 67.42 per cent of variations on the 44 variables. The each of eleven factors contributes 12.52 per cent, 9.94 per cent, 7.40 per cent, 6.02 per cent, 5.45 per cent, 5.01 per cent, 4.92 per cent, 4.86 per cent, 4.04 per cent, 3.94 per cent and 3.32 per cent respectively and these factors are grouped in to technical skill, quality, effectiveness, clarity, availability, adoption, opinion, information, dynamism, access and intimacy.
The results show that brand identity and brand reputation are very important for preference of college by the parents while they are neutral with brand communication.

The results also indicate that brand personality, institutional culture, vision and mission, goals, administrative structure, educational ethos, awareness, recognition, experience, perceived quality, brand loyalty and brand association are also important for preference of college by the parents.

The results show that about 48.00 per cent of parents opined that the image of college is good followed by very good (27.20 per cent) and ok (24.80 per cent).

The results indicate that about 47.20 per cent of parents are satisfied with the quality of engineering education followed by very satisfied (28.80 per cent) and indifferent (24.00 per cent). The results show that the t-value for brand image-satisfaction of quality of education is 11.038 which is significant at one per cent level of significance. Hence, there is a significant difference existing between brand image and satisfaction of quality of education in engineering colleges.

The multiple regression models indicate that the coefficient of multiple determination ($R^2$) is 0.69 indicating the regression model is moderately fit. The results show that brand identity is positively influencing the brand image at one per cent level of significance, while brand personality, brand reputation institutional culture and recognition are also positively influencing the brand image of engineering college at five cent level of significance.

4.3. Faculty and Principal

The factor analysis indicate that there are eleven independent groups were extracted which account for a total of 67.40 per cent of variations on the 27 variables. The each of eleven factors contributes 6.89 per cent, 6.54 per cent, 6.48 per cent, 6.46 per cent, 6.23 per cent, 6.16 per cent, 6.15 per cent, 6.07 per cent, 6.03 per cent, 5.43 per cent and 4.96 per cent respectively and these factors are grouped in to environment, favourable, coordination, excellency, recognition, comfortable, professionalism, appeal, relationship, goodwill and confidence.

The discriminant analysis indicates good remuneration, promotion opportunities, information sharing, great scope for research activities and good rewarding system discriminate best among four income groups. Based on the discriminant function, 75.20 per cent of the measures have been correctly classified.

The professional performance, opinion of faculties, friends, professional’s opinion and publicity through televisions are the major sources for image formation.

The results also show that seminars and events, exhibition, ranking, publicity through radio and advertisement in print media are also sources for image formation as perceived by the faculties of engineering colleges.

The correlation co-efficient shows that gender is positively significantly associated with friends at one per cent level of significance. The results also indicate that gender is negatively correlated with designation and age at five per cent level of significance while it is also negatively associated with department and monthly income at one per cent level of significance.

The correlation co-efficient indicate that designation is positively significantly correlated with age, education and monthly income at one per cent level of significance and it is negatively significantly associated with research experience and membership in professional bodies at one per cent level.

The results also show that age is negatively associated research experience and membership in professional bodies, while it is positively correlated with education, monthly income and teaching experience at one per cent level of significance.

The education is positively significantly associated with monthly income, teaching experience and it is negatively significantly correlated with membership in professional bodies at one per cent level.
The correlation coefficient indicates that monthly income is positively significantly associated with teaching experience and negatively correlated with research experience and membership in professional bodies at one per cent level of significance. The teaching experience is positively significantly associated with experience in current position and it is negatively correlated with research experience and membership in professional bodies at one per cent level.

The results also show that research experience is negatively correlated with experience in current position and membership in professional bodies while experience in current position is negatively correlated with membership in professional bodies at one per cent level of significance. The membership in professional bodies is negatively significantly correlated with ranking while it is positively significantly associated with exhibition at five per cent level of significance.

The Edu QUAL (SERVQUAL) model shows that there are ten independent groups were extracted which account for a total of 68.96 per cent of variations on the 44 variables. The each of ten factors contributes 13.68 per cent, 10.82 per cent, 9.20 per cent, 7.22 per cent, 8.82 per cent, 5.48 per cent, 4.62 per cent, 4.04 per cent, 3.82 per cent and 3.26 per cent respectively and these factors are grouped in to learning, orientation, facilities, development, encouragement, care, needs, transparency, effectiveness and adequacy.

The results show that brand identity, brand reputation and institutional culture are very important for preference of college by the faculties while they are neutral with brand communication, vision and mission and goals. The results also indicate that brand personality, administrative structure, educational ethos, awareness, recognition, experience, perceived quality, brand loyalty and brand association are also important for preference of college by the faculties.

The results show that about half (50.40 per cent) of faculties opined that the image of college is good followed by ok (44.80 per cent) and very good (4.80 per cent). The results indicate that about 63.20 per cent of faculties are satisfied with the quality of engineering education followed by indifferent (22.40 per cent) and very satisfied (14.40 per cent). The results show that the t-value for brand image-satisfaction of quality of education is 12.282 which is significant at one per cent level of significance. Hence, there is a significant difference exiting between brand image and satisfaction of quality of education in engineering colleges.

The results indicate that the coefficient of multiple determinations ($R^2$) is 0.64 indicating the regression model is moderately fit. The results show that brand identity, institutional culture and recognition are positively influencing the brand image at one per cent level of significance, while brand communication and goals are negatively influencing the brand image of engineering college at five cent level of significance.

4.4. Recommendations

Accreditation

Although there are regulatory mechanisms in place to rectify market failures, these regulatory mechanisms suffer from institutional failure. Thus, it is suggested to simplify require not only AICTE approval but also immediate NBA accreditation, with frequent re-accreditation. Furthermore, when the NBA accreditation is carried out, the NBA Manual of Accreditation should be followed. Once the regulatory mechanisms are executed, it seems that the market failures will be mitigated. The information asymmetry problem will be reduced, since NBA accreditation will signal quality in the labor market, thereby reducing quality uncertainty in the education market. Thence, the proliferation of low quality engineering education will be mitigated, as regulation will not allow such low quality products to appear in the market. Once the quality of engineering education in Chennai increases to a suitable level, the flight to foreign engineering colleges should also subside, thereby
solving the two major social ills associated with adverse selection in the engineering education market.

**Faculty Development**
(i) Available training programmes either do not match the training requirement of faculty members or the desired training areas are not available at the suitable time. To minimize the problem, a national calendar for the available pedagogy and subject area training programmes needs to be prepared and the calendar needs to ensure that programmes are not scheduled in the middle of academic calendar.
(ii) Filling up all faculty positions will facilitate deputation of faculty for training without disrupting academic work.
(iii) Participation in both academic and industrial training programmes for pre-defined periods may be made compulsory for faculty.
(iv) Qualitative and quantifiable indicators may be used to assess training achievements.
(v) Institutions need to be empowered to approve deputation of faculty for training, and to appoint substitute faculty on contract.
(vi) Training Needs Assessment (TNA) should be achievable with clearly identified training areas.
(vii) Institutions need to make pre-decided use of the training gains of faculty.

**Salary of Faculties**
Faculty salaries are not expected to be equivalent to the best industrial salaries. However, the differential is very high in Chennai. Industry salaries have increased significantly while faculty salaries have been capped/limited based on the salary structures of senior bureaucrats in government service. The increase in salary with experience (number of years) is marginal. The faculty salary structure needs to be changed based on knowledge and experience then only quality faculties come to teaching and research in engineering colleges.

**Networking**
(i) Formal Networking should not be limited within a small cluster of institutions. They should be allowed to opt for different network partners for various streams based on expertise available and requirements.
(ii) Concurrent academic calendar among network partners is necessary which otherwise poses problems.
(iii) Institutions within the proximity must have information on high-value inventory in other Institutions. They should have clear understanding amongst themselves to access to such physical resources for mutual interest on trans-disciplinary research or joint consultancy activities as a cluster of institutions.
(iv) To ensure student-centered activities, the cost especially related to exchange programme should be shared by both students and institutions.

**Service to Community and Economy**
(i) Involvement of faculty in SCE activity should be career linked.
(ii) Participation of students needs to be ensured through curricula.

**Industry Linkages**
(i) The curricula need to accommodate an industry project in the last two semesters with one supervisor each from the parent institution and industry.
(ii) Exposure to industrial practice for a period of at least two months in a year should be counted towards faculty career advancement.
(iii) Industries, being the major beneficiaries from academic excellence in engineering education, should adopt a few engineering institutions.

**Create New Engineering Colleges through Public-Private Partnerships**

The present model for private engineering colleges is unlikely to build long-term quality engineering institutions. The revenues from fees are capped and are the main income source. A possible model is the creation of a corpus by a private company/ group of companies, commitment by the state/ central government towards grant in aid (based on the number of students joining in the open seats), commitment by the private promoter to provide funds required to compensate any annual budget deficit.

The private promoter can be permitted to obtain returns from the annual surplus (based on the contributions made to the corpus). Alternately incentives could be provided in terms of tax savings; deductions for contributions to the corpus. In addition to this, the sponsors may be allowed a choice of government council members (from an approved master list of professionals, experts and educationalists) and may be provided priority in campus interviews.

**4.5. Conclusion**

The students and parents select a branch and college based on job opportunities/placement. Besides, he brand identity and brand reputation are very important for preference of college by the students and parents. The faculties select a college based on good remuneration and promotion opportunities. Besides, the brand identity, brand reputation and institutional culture are very important for preference of college by the faculties.

The stakeholders of engineering college do not consider the knowledge acquisition, knowledge sharing, research activities, quality teaching, intellectual thoughts and quality in life. Though, the privatization of engineering education significantly contributes in quantum jump, but principally and totally failed in qualitative aspects of engineering education and it results in “education as a business”.

**REFERENCES**


