Factors affecting choice of Engineering Colleges in Odisha, India

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Abstract

Growth of MNC has provided ample scope of employment in India. This factor has widened the door of technical education in the country. Engineering Institutes at present are doing a commandable job in providing pragmatic and value based education. In this context the role of a prospective student in choosing technical education is a dedicate issue in influencing their career. The present study aims in identifying the key factors which affects student's decision in choosing an engineering college in the state of Odisha. Sample size taken in the study constitutes 200 respondents. Analysis was done by factor analysis technique to identify the key components which plays a significant role in student's decision making process.

Keywords: Engineering college, students decision, factor analysis.

Introduction

Education provides a framework within which an individual can learn and gain knowledge. Higher education is very important sector for the growth and development of Human resource which can take responsibility for social, economical and scientific development of the country[1]. In the past two decades education sector in India has changed its shape to provide more value based skills. With the growing concern in pragmatic form of education i.e. Learning by doing, present education system have turned into knowledge oriented, skill oriented, job oriented and competition oriented system. These days, technical education has become broad alternative among the potential students in contrast to that of traditional form of education. The reason may be due to availability of employment opportunity, availability of more specialization, choices criteria availability for entering industries, growth of professionalism etc. Engineering traits provides a student in fulfilling all those causes which is subjected to their career. There are total 2872 number of degree engineering colleges in India with an approximate intake capacity of 10,71,896 (Source: Ministry of Education, Government of India 2010). The total students enrolment in engineering and Technology is approximately 15, 10,762 which accounts for 10% of the overall students in higher education[1]. Therefore choosing the right engineering college is the major concern for the prospective students. Education is the basic right of an individual and parents can choose the same for their children[2]. State Odisha has matured as a major technical education provider in the form of engineering colleges. The state has altogether 91 private engineering institutes with an approximate intake capacity of 37,388 offering various disciplines (according to OJEE information brochure 2012)[3].

Literature Review: Shiao-Chuan Kung in his web survey of 380 samples identified 11 different factors which play a significant role in decision making process. The study was carried out in Wenzao Ursuline College of Languages in Taiwan with respect to distance learning programme. He arranged all the factors in the increasing order of their importance. He found interest in the subject of students interest followed by flexibility as per time and the chances to work with teachers belonging to different localities were the important aspects in the increasing order of their importance[4].

Mutekwe, Maropeng and Maphosa in their study on career choices identified different factors playing significant part on female students in selected high schools in Zimbabwe. They concludes that gender role socialization coupled with teacher attitudes, parental expectations and the influence of peers as well as learners' subject combinations have an enormous impact on the learners' resultant career trajectories[5]. Azubuike in his study in Southeastern Nigeria towards vocational courses identified factors influencing the attitude of the students. He found the interest in the subject, non-availability or shortage of faculties, lack of appropriate guidance, gender disparity lack of counselors and economical conditions of the parents in family were the factors contributing towards choice of vocational courses in the school[6]. Wegner and William in their study on colleges in state of Wisconsin found college type has no significance or is independent of getting a final graduation degree. They concluded getting good rank in hidh school, intellectuality of indivisual student, target oriented aspirants and students with good economic background have a greater chance of completing graduation degree[7]. Wajeeh and Micceri identified distinction between Metropolitan universities and traditional universities by the site of establishment and the ultimate purpose which provides edge of advantade to metropolitan population[8]. Burns in his master thesis studied the factors affecting the choice criteria of college of African-American students at the University of Missouri, Columbia. His

theoretical framework constituted Student Characteristics in the form motivational level Aspiration, rewards in high school and outside influence in the form of Friends, Parents, permanent College uniqueness, expenditure, site accessibility, hard work to converse with students, on paper Information, Campus appointment, admissions were different factors governing entry to a College[9]. Jensen identified three basis of student's retention in advanced education. These factors include Individual Level factors like educational concert, attitude and contentment; University level factors like intellectual commitment and outside factors like group and relatives support are the contributing measures influencing student's retention[10]. Kirmani and Siddiquah studied different factors affecting student's achievement in higher education. They identified six major factors in the form of educational, individual, Media, amenities, directional Services and Organizational atmosphere which contributes towards student's achievement in higher education[11]. Shammot in his study on Jordanian students defined the role of the marketing factors in affecting the choice of a private university. He identified the most important factor affected the students choice of the university was the financial costs, and the least factor was the parents pressure. Also, males give more attention to the cost than females[12]. Patel in their study in Gujarat identified the learner related factors, staff related factors and assessment related factors as significant for the outcome of the students in MBA Programme[13].

Objectives of Study: Present study aims at identifying various factors which affects students in choosing engineering colleges in the state of Odisha. The study is based on identifying the key criteria which influences the students in making decision regarding pursuance of technical education in the form of engineering courses.

Methodology

The study was conducted during the time of engineering counseling/OJEE counseling at four different nodal centers in the state of Odisha namely Cuttack, Rourkela, Burla and Bhubaneswar. It was during the period of July-August 2012. Nodal centers were meant for the final locking of the choice criteria provided by the candidates at the time of e-counseling. Data was collected from the respondents who came for the final choice of engineering college. A total of 200 self-structured questionnaires were administered to collect data from 200 respondents. A pilot survey was conducted by taking information from 20 respondents in order to find out the adequacy of questionnaire. Convenience sampling technique was used in the present study. Table-1 shows a total of 27 different variables were taken in the administered questionnaire. Each item in the questionnaire constitutes scale constituting five points. The points were distributed on the basis of respondent's strong agreement to strong disagreement over an issue. Respondents were then asked to rate the items on their best possible choice.

Table-1
Variables and their descriptions

Variable	Description
V1	Choosing an institution is based on elders suggestion
V2	Selection of an institution is based on its advertisement
V3	Selection of an institution is influenced by others remark
V4	I join institute where i get my choicest branch
V5	Number and qualities of faculty influences my selection of institution
V6	Famous and experience faculty influences my selection of institution
V7	Good infrastructure of an institution influences selection decision
V8	Location of the institution influences my selection decision
V9	I prefer institution nearer to my home
V10	I give importance to communication facilities before taking admission
V11	Institutions fee structure is not an issue before taking admission
V12	I give priority to older institute for taking admission
V13	College hostel and its facilities are very important for me
V14	I give importance to library facilities with provision of e-books before taking admission
V15	I prefer institute with maximum operation hours of library
V16	Availability of extracurricular activities is an important factor of choosing institution
V17	Ragging history of the college is an important consideration before taking admission
V18	I join that institution which has good university results
V19	I join that institution which has good track record
V20	I prefer institution on the basis of the result of that branch which i choose
V21	I join that institution where overall teaching is good
V22	I prefer institution where theory classes are taken regularly
V23	I prefer institution where laboratory classes are taken regularly
V24	I prefer institution having strict college administration
V25	I prefer an institution having discipline in students
V26	I would prefer an institution having good study environment
V27	I select that institution having good placement record

Table-2
Demography of the Respondents

		Frequency	Percent
Age of the respondent	15-20 years	127	63.5
	20-22 years	41	20.5
	23-25 years	19	9.5
	25 years and above	13	6.5
Gender of the respondent	female	43	21.5
	Male	157	78.5
Brought up in	Rural Area	42	21
	Semi-urban area	72	36
	Urban area	27	13.5
	City area	42	21
	Metro area	17	8.5
Monthly income of the Family	less than Rs 5000	12	6
	Rs 5001-Rs10000	25	12.5
	Rs 10001-Rs20000	90	45
	above Rs20000	73	36.5
Size of the Family	1-2 family members	74	37
	3-4 family members	78	39
	5-6 family members	31	15.5
	more than 6 members	17	8.5
Family profession	Service	75	37.5
	Business	62	31
	Cultivation	51	25.5
	Others	12	6
Process of decision making in the family	Father	63	31.5
	Mother	6	3
	Elders	40	20
	Joint decision	86	43
	Outsider	5	2.5
Have you ever associated with the engineering colleges in Odisha	Yes	63	31.5
	No	137	68.5
Source of collecting information regarding the engineering college in Odisha	Paper	40	20
	Relatives	48	24
	Internet	21	10.5
	Advertisement	77	38.5
	Others	14	7
Who motivate you to select a particular engineering college	Family member	58	29
	Relatives	60	30
	Friends	40	20
	Seniors	26	13
	Advertisement	16	8
	Total	200	100

Source: Data collected from Questionnaire

Data analysis was done by the means of SPSS Version 16. In order to draw meaningful inference from the study factor analysis technique was used. Factor analysis is used for data reduction so as to identify most important factors which have significance in the study. Principle component analysis was the approach used in factor analysis which explains the variances in total given by the data. It determines the factors which aggregate different items showing maximum accumulated variance in the data. Varimax method is used for rotation in the study. It maximizes the numbers of variable with high loading on a factor, which enhances the interpretability of factors.

Analysis and Interpretation: Table-2 shows the General background of the respondents i.e. demography. Data collected from all respondents were found to be students. The Age, gender, brought up place, monthly income of the family, family

size, Family profession, Process of decision making in the family, their association with engineering colleges, sources of collecting information and the motivating factors for their choice of colleges are shown in the table.

Reliability test: Before applying factor analysis reliability test was conducted by the means of chronbachs alpha. The overall value of chronbachs alpha for 27 different items was found to be

0.869 which suggests the data is reliable for analysis. Further, KMO test was performed and the value was found to be 0.847 indicating the fact that the sample was good enough for study. Moreover Bartlett Test of Sphericity was found to be overall significant (aprox chi-square=3015 with 0.000 significance value), which proved the data to be valid. Hence factor analysis can be applied by the researcher in the next step.

Table-3
Total Variance of Factors

Component	Eigen Value Total	Extraction Sum of Squared Loadings % of Variance	Cumulative %	Total	% of Variance	Cumulative %	Rotation Sum of Squared Loadings Total	% of Variance	Cumulative %
1	9.086	33.654	33.654	9.086	33.654	33.654	7.569	28.032	28.032
2	2.049	7.589	41.243	2.049	7.589	41.243	2.42	8.964	36.996
3	1.75	6.481	47.724	1.75	6.481	47.724	1.952	7.23	44.226
4	1.544	5.718	53.442	1.544	5.718	53.442	1.811	6.708	50.934
5	1.347	4.987	58.429	1.347	4.987	58.429	1.624	6.013	56.947
6	1.121	4.153	62.582	1.121	4.153	62.582	1.385	5.13	62.077
7	1.052	3.898	66.48	1.052	3.898	66.48	1.189	4.403	66.48
8	0.982	3.637	70.117						
9	0.94	3.48	73.597						
10	0.891	3.301	76.898						
11	0.87	3.221	80.12						
12	0.649	2.404	82.523						
13	0.601	2.225	84.748						
14	0.557	2.061	86.81						
15	0.47	1.739	88.549						
16	0.422	1.562	90.111						
17	0.4	1.48	91.591						
18	0.38	1.408	92.999						
19	0.358	1.326	94.324						
20	0.326	1.208	95.533						
21	0.279	1.033	96.565						
22	0.236	0.874	97.439						
23	0.189	0.698	98.138						
24	0.174	0.645	98.782						
25	0.131	0.486	99.268						
26	0.108	0.401	99.669						
27	0.089	0.331	100						

Source: Data analysis f
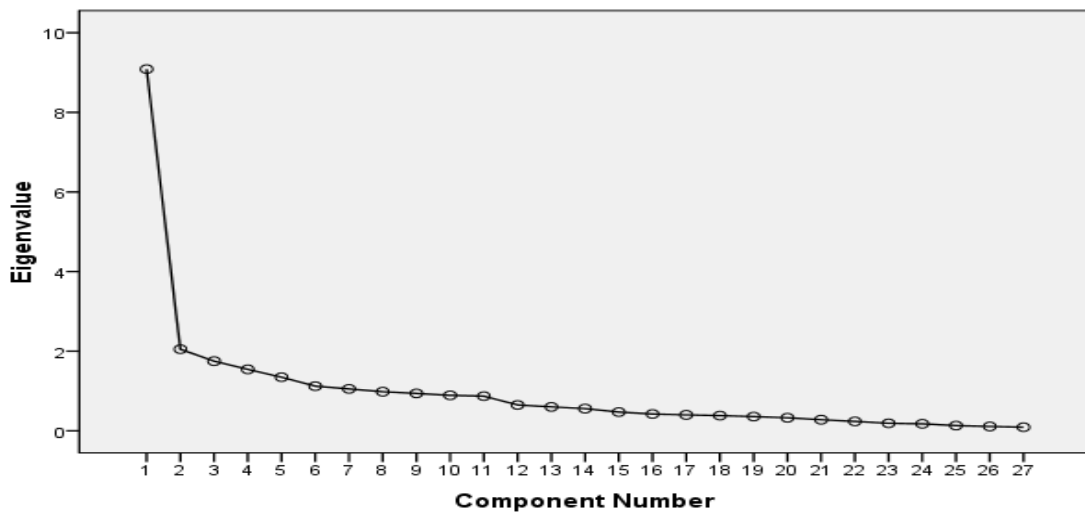
Figure-1
Scree Graph of Eigen Values

Table-4
Rotated component matrix

	1	2	3	4	5	6	7
V1	0.127	0.767	0.1	-0.011	-0.192	-0.133	0.056
V2	0.659	0.443	-0.164	0.035	-0.09	0.146	-0.089
V3	0.008	-0.064	0.316	0.245	0.535	0.104	-0.031
V4	0.51	0.472	0.236	-0.19	0.144	-0.084	0.107
V5	0.452	0.641	-0.03	-0.024	0.018	-0.017	-0.074
V6	0.511	0.477	0.037	0.08	-0.478	-0.151	0.022
V7	0.787	0.158	0.136	0.133	-0.182	-0.218	-0.083
V8	0.759	-0.007	0.12	0.165	-0.04	-0.163	-0.215
V9	0.129	0.064	0.777	-0.124	0.103	0	-0.049
V10	0.707	0.315	-0.087	-0.125	0.029	0.276	-0.05
V11	0.704	0.031	0.098	0.183	-0.382	-0.139	0.122
V12	0.768	0.154	0.246	-0.019	-0.113	-0.094	0.019
V13	0.464	0.124	0.329	0.333	-0.072	-0.31	0.317
V14	0.121	0.053	-0.258	0.022	0.13	-0.018	0.735
V15	0.236	0.547	0.193	0.005	0.336	-0.013	0.063
V16	0.25	0.152	0.702	-0.053	-0.065	0.115	-0.181
V17	-0.005	-0.064	0.022	0.02	0.098	0.808	-0.077
V18	0.69	0.313	0.067	-0.078	0.04	0.126	0.052
V19	0.757	0.215	0.183	-0.079	0.032	-0.035	0.22
V20	0.749	0.234	0.133	-0.114	0.253	-0.036	0.004
V21	0.606	0.079	0.355	-0.008	-0.031	-0.1	0.351
V22	0.768	0.135	0.034	-0.063	0.159	0.105	0.141
V23	0.818	0.052	0.022	-0.046	0.074	0.01	0.091
V24	-0.079	-0.179	0.319	0.18	-0.274	0.564	0.416
V25	-0.022	0.047	0.026	0.843	0.192	0.061	-0.053
V26	-0.042	-0.107	-0.206	0.821	0.114	0.004	0.103
V27	0.036	0.029	-0.103	0.183	0.683	-0.045	0.117

Principal Component Analysis, Varimax with Kaiser Normalization

Table-5
Factor extraction

Factors	% of Variance	Variable included in the Factor	Loading
F1	28.032	Advertisement(V2)	0.659
		Famous and experience faculty (V6)	0.511
		Good infrastructure of an institution (V7)	0.787
		Location of the institution (V8)	0.759
		communication facilities (V10)	0.707
		Institutions fee structure (V11)	0.704
		priority to older institute (V12)	0.768
		College hostel and its facilities (V13)	0.464
		good university results(V18)	0.69
		Good track record of institution (V19)	0.757
		result of that branch (V20)	0.749
		Good overall teaching (V21)	0.606
		Regular theory classes (V22)	0.768
		Regular laboratory classes (V23)	0.818
F2	8.964	Selection based on elders suggestion(V1)	0.767
		choicest branch(V4)	0.472
		Number and qualities of faculty (V5)	0.641
F3	7.23	nearer to my home(V9)	0.777
		extracurricular activities (V16)	0.702
F4	6.708	discipline in students(V25)	0.843
		good study environment(V26)	0.821
F5	6.013	Selection by others remark(V3)	0.535
		good placement record(V27)	0.683
F6	5.13	Ragging history of the college (V17)	0.808
		strict college administration(V24)	0.564
F7	4.403	library facilities with provision of e-books (V14)	0.735
		maximum operation hours of library(V15)	0.063

Results and Discussion

Factor analysis was applied to all the 27 variables taken for study. Table-3 explains the total variance of various factors for study. The eigen values were shown on a bicoordinate plane in the figure-1. It shows the total of 7 factors have eigen value more than one. The same is also observed from the table that only 7 factors had Eigen value more than 1, so considerations were made in regards to these factors. The variance explained in total by factor ranging from 1 to 7 was found to be 28.032, 8.964, 7.23, 6.013, 5.13, and 4.403 respectively. The overall cumulative variance explained by all these factors was found to be 66.48 percent. Rest of the variance was due to other factors which are least important for the study. Table-4 shows the Rotated component matrix of various factors with their factor loadings. Each item in the matrix is correlated with the factor corresponding to the factor loading. Stronger correlation is observed between the factor and items where the loading value is high. Table-5 shows the factor extraction table, which was prepared on the basis of rotated component matrix. The table shows different factors ranging from F1 to F7. Each factor constitutes different items with their factor loading. The factors are in order of percentage of variance explained by the collective items taken together. It can be observed from the table that advertisement, Famous and experience faculty, Good infrastructure of an institution, Location of the institution, communication facilities, Institutions fee structure, priority to older institute, College hostel and its facilities, good university results, Good track record of institution, result of that branch, Good overall teaching, Regular theory classes, Regular laboratory classes are the most important variables for choosing an engineering institution. Whereas variables like Ragging history of the college, strict college administration, library facilities with provision of e-books, maximum operation hours of library are the factors which are least important variables for choosing the same.

Conclusion

Present study examined various factors which are very important and least important for the prospective students of engineering education. After clubbing all the 27 variables into 7 different factors in order of their importance it was found that college related variables like advertisement, Famous and experience faculty, Good infrastructure of an institution, Location of the institution, communication facilities, Institutions fee structure, priority to older institute, College hostel and its facilities, good university results, Good track record of

institution, branch result, Good overall teaching, Regular theory classes, Regular laboratory classes are given the highest priority before taking admission in the college by the students. Variables like elders suggestion for college selection, availability of choicest branch, Number and qualities of faculty, College nearer to home, extracurricular activities in the college are of moderate priority in decision making regarding college choice where are variables like Ragging history of the college, strict college administration, library facilities with provision of e-books, maximum operation hours of library are the items in the factor which are considered to be less significant in the decision making by prospective students.

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