



Analysis of Industry readiness of engineering students with respect to sustainable employability skills in Nagpur region

Dr.Madhavi Wairagade
Associate Professor
Jhulelal Institute of Technology,Nagpur
[Email-mwairagade@jit.org.in](mailto:mwairagade@jit.org.in)
[Contact Details – 9922417370](tel:9922417370)

Abstract:

India aims to become a global super power. The current situation is alarming and the future of thousands of engineering graduate students is at stake. Every small step in the right direction by researchers to nurture and build a talented & employable workforce will play a significant role in realizing this dream. Currently, while there is no shortage of opportunities in the employment setup, there is a considerable lack of employable talent. Students in today's campuses encounter a variety of complex situations for which they are often ill-prepared by experience or individual development. Students must be given the space and scope to think and innovate, to question and to come up with solutions. This applies to both school education and higher education. The lack of ability of the students to deliver their views effectively at the interview leads to rejection of even the most brilliant candidate. The ability to apply the concepts learnt to develop innovative things and find solutions to complex problems are main factors working behind the employability of an engineer. Campus placement activity is very important for technical institutes, industries and students. Parents prefer institutes which help their wards in providing placement opportunities. Education should mould the personality of an individual. Education should be a light of knowledge which should lead the world in a right path. Educational institutions should give more importance to value based education in addition to preparing the students to get more marks in examinations. Education has always been concerned with broader sense of humanity, quality of human life and human excellence.



Nagpur region is churning out thousands of graduates every year which should ideally fill new jobs however the reality is that many of these fresh graduates are not fully ready for the jobs that the industry is offering. In spite of having huge requirement of engineering manpower, industry finds it difficult to get suitable manpower. In this study, the various employability skills linked with the past performance of engineering students in academics, co-curricular activities, extracurricular activities and their value based education that may likely influence their performance in campus placement are in consideration.

Keywords:

Employability, placement academics, co-curricular activities, opportunities, technical institutes, extracurricular activities industries , engineering students,

Introduction:

Employability of an individual is the possession of the qualities and competencies required to meet the changing needs of employers and customers and thereby help to realize his or her aspirations and potential at work.

There are various elements of generic skills namely communication skills, creative thinking, problem solving skills, team working skills, lifelong learning, information management, entrepreneurship skills, morale, professional ethics and leadership skills. Generic skills development is crucial to be employable. The issue of low employability of engineering graduates is a matter of concern for technical institutes, industries and also the government. This situation

demands a tool to predict employability & level of skill sets required by students. Institute needs to change their traditional focus & make special efforts to help their students to develop competencies that best foster employability.

Prediction of performance in engineering field may be useful to students to decide their career & may motivate & encourage them to pursue higher studies. The quality of candidates admitted into any higher institution affects the level of research and training within the institution and by extension, has an overall effect on the development of the country itself, as these candidates eventually become key players in the affairs of the country in all sectors of the economy.



The distinctive nature of the institutional ethos affects the values and interests manifested in the campus climate and the overall effect of the college experience on the student. Value education should promote lively discussion and thoughtful reflection that leads to explore further values as a part of academics and in society, the community, and one's individual life. The process of value education involves clarifying, modeling, teaching, and asking students to role model values and to apply them in their educational, personal and professional lives. Value education facilitates moral maturity and a holistic mindset. This research deals with the need to create such a mindset and the human values associated with it.

The purpose of this research is to offer advice to the engineering profession and

Literature Review :

Gokuldas (2011), identified predictors of employability of undergraduate engineering students in campus recruitment drives of Indian software companies. They have conducted a study of engineering graduates from a reputed engineering college in South India with respect to their academic background along with their performance in various

industry to aid the development of strategies for attracting students in its direction and also to create engineering professionals to suit the requirement of industry & corporate world. The employability of engineering students and their aspirations should match in order to have fruitful and successful career. Hence the mapping of various academic parameters, superimposed with current assessment of their potential on the basis of aptitude test, group discussion and personal interview can generate certain indicators of success in future placement, higher education or entrepreneurship. With our experience of over 25 years, it is observed that an early indication to students & parents may be reasonably given before entering engineering education to enhance the overall satisfaction rate.

non-technical trainings was analyzed vis-à-vis their performance in the campus recruitment drives of major information technology companies in India. It was observed in this study that knowledge of engineering (GPA) and proficiency in English language were two important predictors of employability for engineering graduates in campus interviews of



software services companies. It was also found that, in campus recruitment drives of industries related to software services, female students were better performers than their male counterparts, unlike in other core engineering sectors.

Little (2011), has explored the impact of foundation degrees on students and the workplace, in the light of government's plans for the continuing expansion and discussions about employability. The study found that the majority of the students cited increased confidence as the main gain from their studies. The confidence was expressed in terms of how students' enhanced knowledge and understandings informed their workplace activities and tasks but these expressions did not necessarily fit neatly into narrow skills' definitions. Also the findings hinted at some students facing difficulties in using their enhanced "skills" in the workplace.

Mishra and Mishra, (2011), have stated that changing business environment has led to changes in the meaning of employment. The objective of this study was to develop a measure of employability skills for respondents willing to work in business organizations. The findings of the

study show that employability skills can be measured using the instrument on six dimensions viz. skill up-gradation and career growth, task-orientation, blue-eyed boy of bosses, professional networking and concern for time and love for challenge. The reliability of the instrument ranges from moderate to high for each of these dimensions, the instrument can be further validated with other existing instruments on employability to make it more robust.

Morgan and O'Gorman, (2011), have revealed that although engineers are employed primarily for their technical skills, the general consensus is that employers are looking for graduates who possess excellent interpersonal skills, are commercially aware and who can contribute to the success of the organization. Small to medium-sized enterprises (SMEs) do not generally have customized graduate training programs like large corporate. So the graduate engineer is often required to do multitasking and is in a managerial position within a very short time of taking up employment. The study is conducted in UK and Ireland, where majority of engineers are employed by SMEs. Since



most employers within Northern Ireland fall in this category, it follows that engineering courses within a regional university such as the University of Ulster should seek to embed these essential skills within its engineering programs. Engineering programs in many UK universities offer curricula that are already packed with modules that lay the foundations for the mathematical, scientific and technical knowledge base that is fundamental to the formation of the professional engineer. The challenge for program developers within higher education is to maintain the technical excellence within engineering degrees whilst simultaneously developing the business awareness and soft skills that industry has identified as being so important when recruiting graduate engineers. Most professional engineers aspire to become chartered engineers and a chartered engineer is expected to provide leadership, not just technical but commercial and management leadership,

Objective of the paper

To measure industry readiness of engineering students of Nagpur region

Hypothesis:

mediated through effective interpersonal skills.

Rao,(2011), has concluded that there is a gap between expectations of employers and the services delivered by graduates. Employers do not want to experiment. They are also reluctant to spend time and resources on graduates training program. They expect that employee should perform at his best from day one. Hence, they do not select the fresh graduates on large scale. Employers are inclined to select those graduates who have some basic knowledge about working in organization, have better communication and presentation skills and those who have the capability of transforming their knowledge into output. So less preference is given to fresh graduates as compared to experienced ones. As per this study the important employability skills are problem solving skills, team work, and self confidence

with respect to sustainable employability skills and social role of engineering education



Industry readiness of students is dependent on value based education and excellence in engineering

.Evidences from the Engineering colleges in Nagpur

Employability of an individual is the possession of the qualities and competencies required to meet the changing needs of employers and customers and thereby help to realize his or her aspirations and potential at work.

The issue of low employability of engineering graduates is not only the concern of technical institutes but also of industries and the government at large. This situation demands a tool to predict employability & level of skill sets required by students. Institute needs to change their traditional focus & make special efforts to help their students to develop competencies that best foster employability. Value education enhances moral maturity and the development of a holistic mindset. This research deals with the need to create such a mindset and the human values associated with it.

Most of the engineering undergraduates need training to make them employable. Only 7.5 percent of engineering students are found employable for non IT field, when all factors like Technical, Analytical

and Communication Skills are considered. Around 80 percent of the students do not meet the requirements on problem solving & analytical skills, 64% of employers are not satisfied with quality of skills possessed by fresh engineering graduates. The learners need to pick up skills as a part of their education. Only 18.43% are employable in software development, while only 3.95% have appropriate training for direct deployment on projects. This percentage of employable fresh engineers is only 5.55% for core jobs in mechanical, 7.07 % in electronics/electrical and 6.48% in civil engineering sector.

The purpose of this research is to offer advice to the engineering profession and industry to aid in creating engineering professionals to suit the requirement of corporate worldand also for development of strategies to attractstudents.An early indication to students & parents before entering engineering education may enhance the overall satisfaction rate



.Impact of performance in academics as well as co-curricular and extra-curricular activities on Aptitude Test Score, Group Discussion Score and Personal Interview Score:Academic Performance

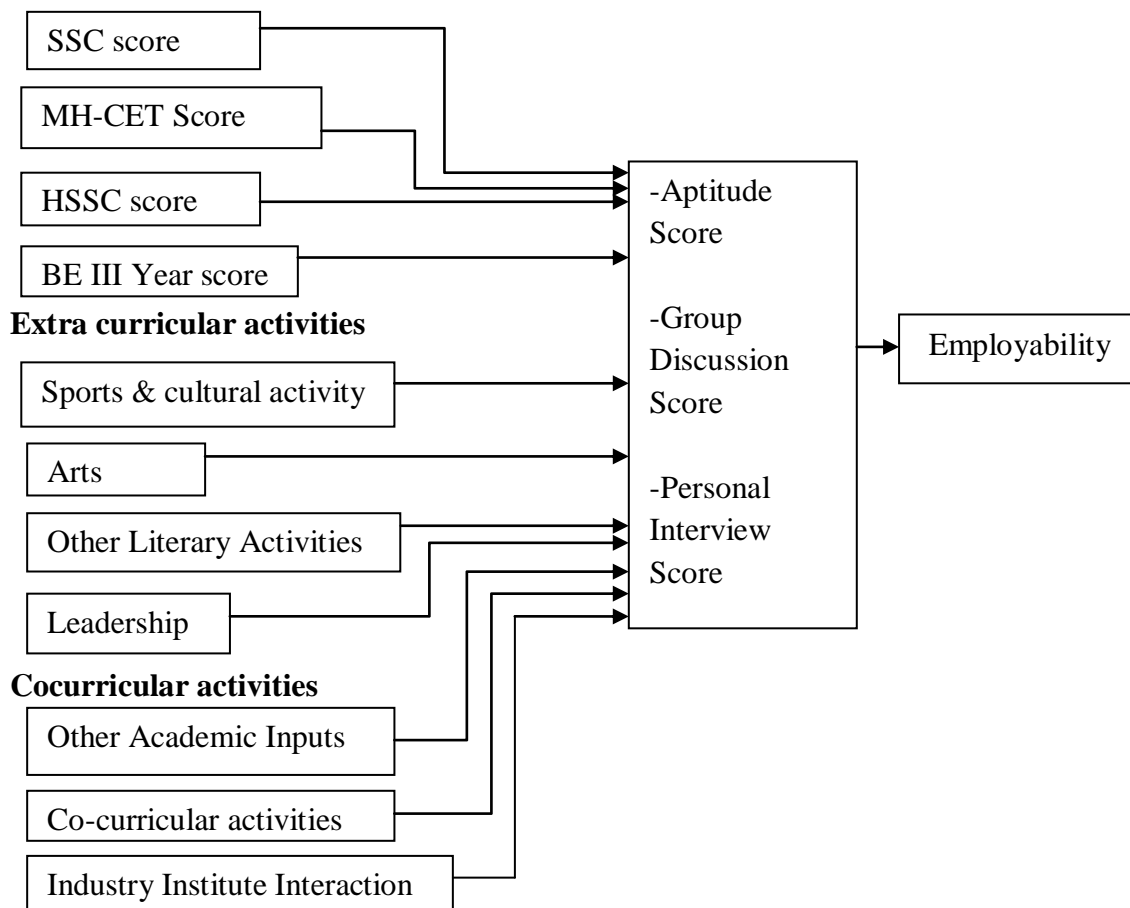


Figure 1: Block diagram for effect of academic as well as performance of students in Co-curricular and Extra Curricular activities on their employability for models VII, VIII & IX.

In next three models, that is model number VII, VIII and IX, the effect of performance of students in academics as well as extra & co curricular activities, on their

performance in aptitude, group discussion and personal interview rounds conducted in campus placement drives has been studied

Aptitude Test & Performance of students in academics as well as in co-curricular and extra-curricular activities



This model studies the effect of performance of students in both academics as well as various extra and co curricular activities in past and present, on their

performance in aptitude test round. Linear multivariate regression analysis, using SPSS is done for this model

Table 1: Regression Model Summary for Aptitude Test Score and Academic performance, Co-Curricular and Extra Curricular Activities’ Scores

Model Summary				
Model	R	R ²	Adjusted R ²	Std. Error of the Estimate
VII	.797 ^a	.636	.629	1.09020
a. Predictors: (Constant), leadership qualities, arts, industry institute interaction, curricular activity, sports and culturalactivity, literary activity, other academic inputs, SSC %, CET %, BE III yr %, HSSC %.				

Table 1 shows the regression model summary for an equation where aptitude score is dependent variable while academic performance and performance in extra and co curricular activities are independent variables. R represents the coefficient of correlation. The value of R is found to be 0.797 which shows high

positive correlation between aptitude score of the students and academic performance and extra and co curricular activities. R², Coefficient of Determination, is found to be 0.636 i.e. 63.60% which shows that 63.60% changes in aptitude score are explained by academic performance and performance in extra and co curricular activities with a standard error of estimate of 1.09

Chi-Square Automatic Interaction Detection (CHAID) Analysis for Aptitude Test Score and Academic performance, Co-Curricular and Extra Curricular Activities’ Scores

The tree diagram in figure 1 shows the result of Model in the form of CHAID

analysis. CHAID analysis shows that performance of students in aptitude test is

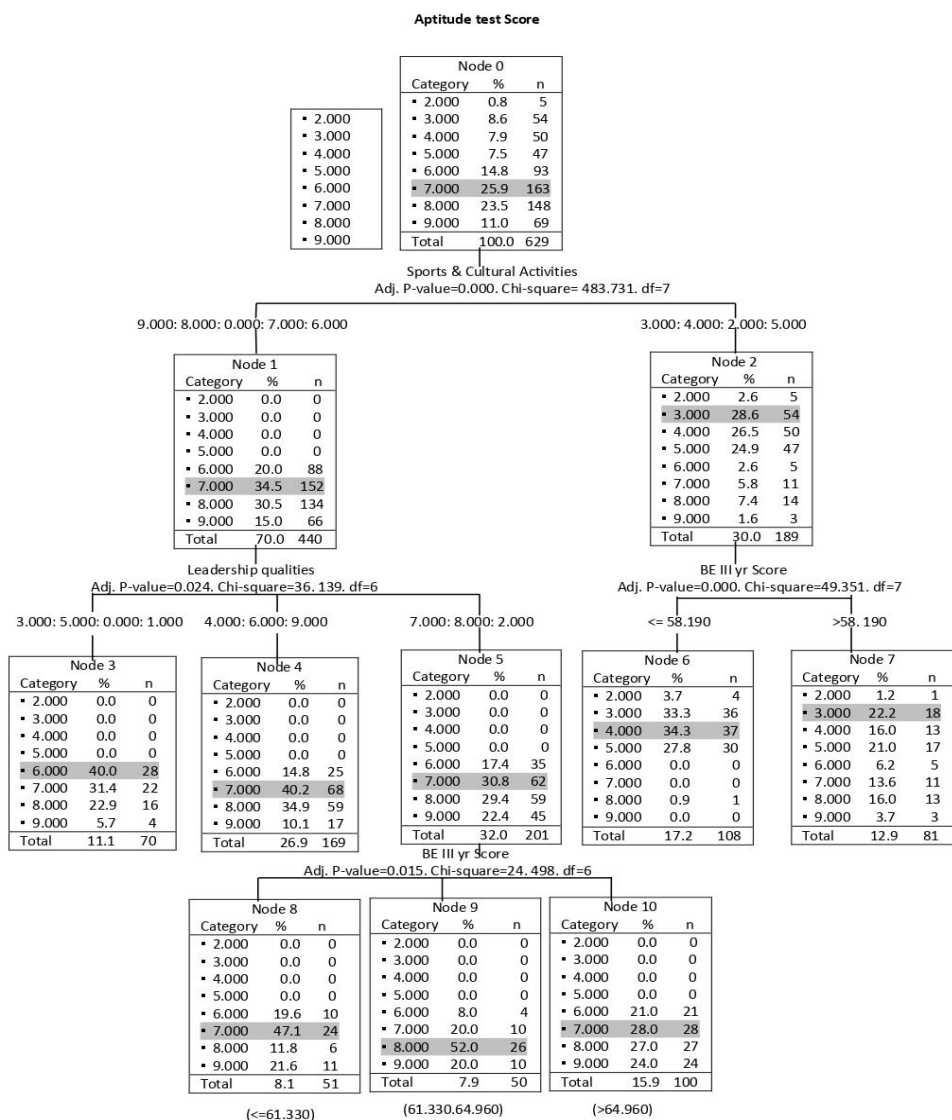


dependent upon their performance in sports & cultural activities. However regression does not show significant relationship of participation in sports and cultural activities with aptitude score of the candidate. CHAID analysis shows the relationship based on nodes (groups) formed. Participation in sports and cultural activities is classified into two nodes viz. node 1 and node 2. As seen in figure, node 1 consists of students who had a score of 0, 6, 7, 8 and 9 out of 10 in sports and cultural activities. The number of students in this node is 440 i.e. 70% out of 629 students. Out of these 440 students, maximum 152 i.e. 34.2% students have scored 7 in aptitude test. 134 i.e. 30.5% students have scored 8 while 66 i.e. 15% students have scored 9 in aptitude test out of 10. 88 i.e. 16% students have scored 6. None of the students in this node have scored below 6 in aptitude test.

Thus it can be concluded that the students who participated more in sports and cultural activities were able to score more in aptitude test. Some exceptional students who did not participate in sports and cultural activities were also able to score more than 6 in aptitude score. Probably these students would have performed very well in sports and cultural activities but did not get an opportunity to participate. Node 2 consists of students who had a score of 2, 3, 4, and 5 out of 10 in sports and cultural activities. The number of students in this node is 189 i.e. 30% out of 629 students. Out of these 189 students, 54 i.e. 28.6% students have scored 3 in aptitude test. 50 i.e. 26.5% students have scored 3 while 47 i.e. 24.9% students have scored 5 in aptitude test. 14 i.e. 7.4% students have scored 8 in aptitude test. 11 i.e. 5.8% students have scored 7 and 5 students each have scored 2 & 6.



Figure 1 Chi-Square Automatic Interaction Detection Analysis for Aptitude Test Score and Academic performance, Co-Curricular and Extra Curricular Activities' Scores



Only 3 students could score 9 in aptitude test. Thus it can be concluded that those students who had lower participation in sports and cultural activities were not able to score good marks in aptitude test. This relationship of aptitude score with sports and cultural activities is found to be

significant based on chi-square test. The chi-square value is found to be 483.731 at 7 degrees of freedom. The p-value is 0.000 which is less than 5% level of significance. Hence it can be concluded that there is a relationship between the groups formed on



the basis of participation for sports and cultural activities and aptitude score.

Node 1 is further grouped into node 3, 4 and 5 which is based on its relationship with students' participation in leadership activities. Node 1 consists of 440 students which have been classified into node 3 with 70 students who have a score of 0,1,3 and 5 in leadership activities. Maximum 28 i.e. 40% out of these 70 students have scored 6 points in aptitude test. 22 students have scored 7 points, 16 students have scored 8 points while only 4 students have scored 9 points.

Node 4 consists of 169 i.e. 26.9% out of 440 students who have a score of 4,6 and 9 in leadership activities. Out of these 169 students, maximum 68 i.e. 40.2% students have scored 7 in aptitude test. 59 i.e. 34.9% students have scored 8 while 25 i.e. 14.8% students have scored 6. 17 students have scored 9 in aptitude test out of 10. Thus, it can be found that those students who had participated in leadership activities have done well in aptitude test and they also preferred sports and cultural activities.

Node 5 consists of 201 i.e. 32% out of 440 students who have score of 2, 7 and 8 in leadership activities. Out of these 201 students, maximum 62 i.e. 30.8% students

have scored 7 in aptitude test. 59 i.e. 29.4% students have scored 8 while 45 i.e. 22.4% students have scored 9. 35 students have scored 6 in aptitude test out of 10. None of the students have scored less than 6 in aptitude test in this node. Thus, it can be found that the students who had more preference to leadership activities have very good scores in aptitude test and they also preferred sports and cultural activities. These groups have found to have significant relationship with node 1 at 5% level of significance. Chi-square value is found to be 36.139 at 6 degrees of freedom as p-value 0.024 which is less than 0.05.

Node 5 containing 201 students have been further classified into three nodes viz. 8,9 and 10 on the basis of their BE III year marks. Node 8 consists of 51 students who have scored less than 61.33% in BE III year. Out of these 51 students, maximum 24 i.e. 47.1% students have scored 7 in aptitude test. 11 students have scored 9 while 10 students have scored 6 while 6 students have scored 8 in aptitude test out of 10.

Node 9 consists of 50 students who scored from 61.33% to 64.96% in BE III year. Out of these 50 students, maximum 26 students have scored 8 in aptitude test. 10



students each have scored 7 and 9 while 4 students have scored 6 in aptitude test.

Node 10 consists of 100 students who have scored more than 64.96% in BE III year. Out of these 100 students, maximum 28 students have scored 7 in aptitude score. 27 and 24 students have scored 8 and 9 respectively in aptitude score while 21 students have scored 6. It is found that those students who have scored more in BE III year, have scored more in aptitude test also. This relationship of BE III year score with node 5 has been tested with chi-square test. It is found that the chi-square value is 24.498 at 6 degrees of freedom. The p-value is 0.015 which is less than 5% level of significance. Hence, there is relationship between aptitude test score of students with preference of 2,7 and 8 in leadership activities and BE III year percentage.

Node 2 has been further classified into node 6 and node 7. Out of 189 students in

node 2, node 6 contains 108 students who have scored less than 58.19% in BE III year. Out of these 108 students, maximum 37 students have scored 4 in aptitude score. 36 students have scored 3 while 30 students have scored 5 in aptitude score. Only 1 student has scored 8.

Node 7 consists of 81 students who have scored more than 58.19% in BE III year. Out of these 81 students, 18 students have scored 3 while 17 students have scored 5. 13 students each have scored 4 and 8 in aptitude score. 11 students have scored 7 while 5 and 3 students have scored 6 and 9 respectively.

This relationship is also tested with chi-square test and is found to be significant at 5% level of significance. The chi-square value is found to be 49.351 with 7 degrees of freedom. P-value is found to be 0.000 which is less than 5% level.

Group Discussion and Academic performance, Co-Curricular and Extra Curricular Activities' Scores:

This model studies the effect of performance of students in both academics as well as various extra and co curricular activities on their performance in group

discussion round. Linear multivariate regression analysis, using SPSS is done for this model.



Table 2 shows regression model summary for an equation where group discussion score is dependent variable and performance of students in academics as well as various extra and co curricular activities are independent variables. R represents the coefficient of correlation. The value of R is found to be 0.787 which shows high positive correlation between aptitude score of the students and

academic performance and social skill variables. R^2 , Coefficient of Determination, is found to be 0.620 i.e. 62.00%. The value of R^2 shows that 62.00% changes in aptitude score are explained by academic performance and performance in extra and co curricular activities with a standard error of estimate of 1.35.

Table 2: Regression Model Summary for Performance in Group Discussion and performance in Academics as well as Co-Curricular and Extra Curricular Activities

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
VIII	.787 ^a	.620	.613	1.35831
a. Predictors: (Constant), art, sports and cultural activity, leadership qualities, literary activity, industry institute interaction, other academic inputs, curricular activity, SSC %, CET % Score, HSSC %, BE III year %.				

Chi-Square Automatic Interaction Detection (CHAID) Analysis for Performance in Group Discussion with performance in Academics as well as Co-Curricular and Extra Curricular Activities

The tree diagram in figure 2 shows the CHAID result. It shows relationship between group discussion score and students' participation in leadership activities. It is found that out of 11

independent variables, group discussion score is found to be related to participation of students in leadership activities. This tree diagram relation has been constructed using chi-square test of association in



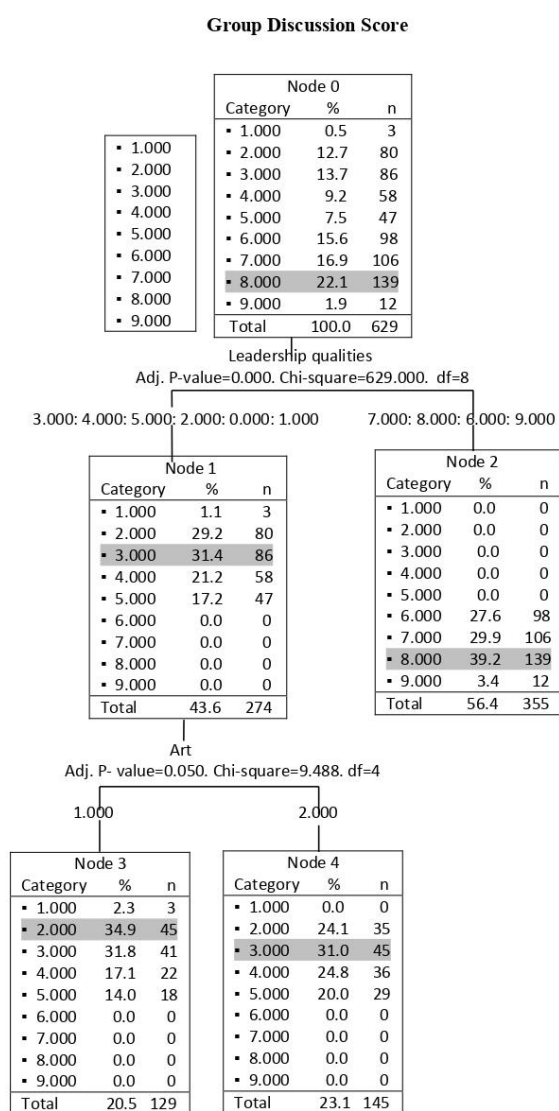
CHAID. Node 0 of group discussion score has been classified into node 1 and node 2.

Node 1 consists 274 i.e. 43.60% out of 629 students who had score of 0,1,2,3,4 or 5 out of 10 in leadership activities. Out of these 274 students, maximum 86 i.e. 31.4% students have scored 3 in group

discussion. 80 students have scored 2, 58 students have scored 4 while 47 students have scored 5. Only 3 students out of 274 were able to score 1 in group discussion. None of these 274 students could score 6 or above in group discussion.



Figure 2 Chi-Square Automatic Interaction Detection (CHAID) Analysis for Performance in Group Discussion and performance in Academics as well as Co-Curricular and Extra Curricular Activities



Node 2 consists of 355 i.e. 56.4% students out of 629 who have a score of 6,7,8 or 9 out of 10 in leadership activities. Out of these 355 students, 139 i.e. 39.2% students have scored 8 in group discussion. 106

students have scored 7 in group discussion. 98 students have scored 6 while 12 students have scored 9. This relationship is found to be significant based on Chi-square test. Chi-square value is found to be



629.00 at 8 degrees of freedom. The p-value is 0.000 which is less than 5% level of significance. It shows that there is relationship between participation of students in leadership activities and their group discussion score. All the 355 students in this category have scored 6 or above in group discussion. This indicates that more preference of students to leadership activities will increase their group discussion score.

Further node 1 with 274 students has been divided into node 3 and node 4 based on students' participation in artistic activities. Node 3 consists of 129 students out of 274 students in node 1 who did not participate in artistic activities. It is found that out of 129 students who did not participate in artistic activities, maximum 45 i.e. 34.9% students were able to score 2 in group discussion. 41 students have scored 3, 22 and 18 students have scored 4 and 5 respectively while only 3 students scored only 1 in group discussion.

Node 4 consists of 145 students out of 274 students in node 1 who had participated in

Performance in Personal Interview and performance in Academics as well as Co-Curricular and Extra Curricular Activities

This model studies the effect of performance of students in both academics as well as various extra and co curricular

artistic activities. It is found that out of 145 students who had participated in artistic activities, 45 i.e. 31% students were able to score 3 in group discussion. 36 students have scored 4, 35 and 29 students have scored 2 and 5 respectively. Thus, it is found that those students who had participated in artistic activities were able to score more than the students did not participate in artistic activities. This relationship is tested with chi-square test and is found to be significant at 5% level of significance with chi-square value of 9.488 at 4 degrees of freedom. The p-value is found to be 0.050 which exactly is the 5% level of significance.

It can be concluded that group discussion score has relation with participation in leadership activities. Students who had lower preference to leadership activities had low scores in group discussion and had relationship with participation/non participation in artistic activities.

activities on their performance in personal interview round. Linear multivariate



regression analysis, using SPSS is done for this model.

Table 3: Regression Model Summary for Performance in Personal Interview and performance in Academics as well as Co-Curricular and Extra Curricular Activities

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
IX	.804 ^a	.646	.639	1.21033
a. Predictors: (Constant), art, industry institute interaction, other academic inputs, curricular activity, sports and cultural Activity, leadership qualities, literary activity, SSC %, CETScore, HSSC %, BEIII yr %.				

Table 3 shows regression model summary for an equation where personal interview score is dependent variable and performance of students in academics as well as various extra and co curricular activities are independent variables. R represents the coefficient of correlation. The value of R is found to be 0.804 which shows high positive correlation between personal interview score of the students

and academic performance and social skill variables. R^2 , Coefficient of Determination, is found to be 0.646 i.e. 64.60%. The value of R^2 shows that 64.60% changes in personal interview score are explained by academic performance and co-curricular & extra-curricular activities with a standard error of estimate of 1.21.

Chi-Square Automatic Interaction Detection (CHAID) Analysis for Performance in Personal Interview and performance in Academics as well as Co-Curricular and Extra Curricular Activities

Tree diagram shows CHAID analysis where personal interview score is dependent and 11 independent variables including academic and extra & co-curricular activities. Personal interview

score has been divided in 4 nodes. The tree diagram shows the CHAID analysis between personal interview score and academic and extra & co-curricular activities using chi-square test. It is found



that personal interview score is highly related to students' participation in industry institute interaction with chi-square value of 537.254 and degrees of freedom 24. This value is found to be significant at 5% level of significance.

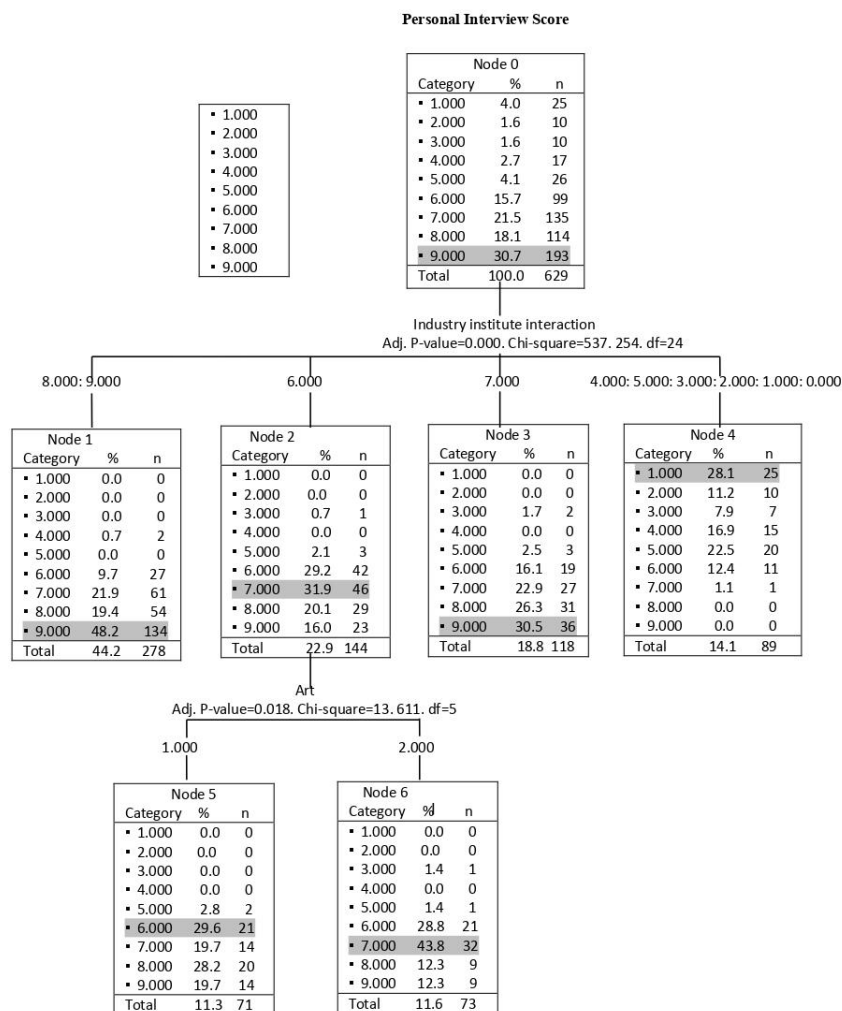
It is found that out of 629 students, 193 i.e. 30.7% students have scored 9 in personal interview out of 10. 135 i.e. 21.5 students have scored 7 while 114 i.e. 18.10% students have scored 8 out of 10. Total 99 i.e. 15.7% students have scored 6. Remaining 26, 25, 17 and 10 students have scored 5, 1, 4, 2 and 3 respectively.

CHAID analysis hasfound relationship with industry institute interaction based on nodes formed which have been classified into node 1, 2, 3 and 4 with participation score in industry institute interaction as 8 and 9, 6, 7, and 0 to 5 respectively.

Node 1 has 278 i.e. 44.2% students out of 629. 134 i.e. 48.2% out of 278 students of this node have scored 9 in personal interview. 61 i.e. 21.9% students have scored 7 in personal interview while 54 i.e. 19.4% students have scored 8 in personal interview. Remaining 29 students have scored 6 and 4 in personal interview.



Figure 3 Chi-Square Automatic Interaction Detection (CHAID) Analysis for Personal Interview Score and Performance in Co-Curricular and Extra Curricular Activities



Node 2 has 144 i.e. 22.9% students out of 629 who have participation score of 6 in industry institute interaction activities. Out of these 144 students, 46 i.e. 31.9% students have scored 7 in personal interview. 42 i.e. 29.2% students have

scored 6 in personal interview. 29 and 23 students have scored 8 and 9 in personal interview while only 3 and 1 students have scored 5 and 1 respectively.

Node 3 has 118 i.e. 18.8% students out of 627 who have a score of 7 in industry



institute interaction activities. Out of these 118 students, 36 i.e. 30.5% students have scored 9 in personal interview. 31, 27 and 19 students have scored 8, 7 and 6 in personal interview respectively. Only 4 students have got the personal interview score of 5 and 3.

Node 4 has 89 students who have a score of 0 to 5 in personal interview. Out of these 89 students, 25 i.e. 28.1% students have scored only 1 in personal interview. 20 i.e. 22.5% students have scored 5 in personal interview. None of the students out of 89 have secured 8 and 9 in personal interview. Only 1 student has been able to secure 7 in personal interview.

Node 1 is classified in two nodes viz. node 5 and node 6 based on their score in CET. Node 5 consists of 163 students out of 278 who have scored between 30% to 60% marks in CET. Out of these 163 students, 84 students have secured 9 in personal interview. 39 and 34 students have secured 8 and 7 in personal interview respectively. Only 4 students have scored 6 in personal interview out of 163.

Node 6 consists of 115 students who have scored less than 30% marks and 60%-70% marks in CET. Out of these 115 students, 50 students have secured 9 in personal interview, 27 and 23 students have secured

7 and 6 respectively while only 15 students have secured 8. Node 1 is found to have significant relationship with node 5 and node 6 based on chi-square test of association. Chi-square value is found to be 28.015 at 4 degrees of freedom. This value is found to be significant at 5% level of significance as p-value is less than 0.05. Node 6 has been further divided in node 11 and node 12 based on students' participation and non participation in artistic activities. Node 11 consists of 55 students out of 115 who did not participate in artistic activities. Out of these 55 students, 26 have scored 9 while 17 have scored 7 in personal interview. Only 3 students have scored 8 and 9 students have secured 6 in personal interview.

Node 12 consists of 60 students out of 115 who have participated in artistic activities. Out of these 60 students 24 i.e. 40% students have scored 9 while 14 students have scored 6 in personal interview. 10 and 12 students have scored 7 and 8 in personal interview respectively. Node 11 and node 12 is found to have significant relationship with node 6 at 5% level of significance. Chi-square value being 8.180 at 3 degrees of freedom and p-value is 0.042 which is less than significance level of 0.05.



Further Nodes have been classified based on score in artistic activities. Node 2 has been classified into node 7 and node 8. Node 2 has 144 students who have been classified based on their participation and non-participation in arts. Thus node 7 has 71 i.e. 11.3% students who did not participate in arts. Out of these 71 students, 21 i.e. 29.6% students have scored 6 in personal interview. 20 students have scored 8 while 14 students each have scored 7 and 9 in personal interview.

Node 8 has 73 students out of 144. Total 32 i.e. 43.8 students have scored 7 in personal interview while 21 students have secured 6 in personal interview. 9 students each have scored 8 and 9 in personal interview. The score of these 144 students is found to have relationship with personal interview score based on the chi-square value of 13.611 at 5 degrees of freedom at 5% level of significance who have a score of 6 in industry institute interaction.

It can be concluded that group of students with participation in industry institute interaction has relation with personal interview score. But students who had a

score of 6 are found to have relation with participation in arts.

Node 3 has been further divided into node 9 and node 10. Node 3 consists of students who have a score of 7 in industry institute interaction. Out of these 118 students in node 3, total 62 students belong to node 9 who have secured less than 66% in HSSC. Out of these 62 students, 24 students have secured 8 in personal interview while 19 students have 9 score. 10 and 6 students have secured 7 and 6 respectively. Only 3 students have secured 5.

Out of these 118 students in node 3, 56 students belong to node 10 who have secured more than 66% in HSSC. Out of these 56 students, 17 students each have secured 7 and 9 in personal interview while 13 students have 6 score. 7 and 2 students have secured 8 and 3 respectively. The score of these 118 students at node 3 and node 9 and 10 is found to have significant relation at 5% level of significance. Chi-square value is found to be 18.57 at 5 degrees of freedom. The students who scored more in HSSC have preferred industry institute interaction and have done well in personal interview.

Interpretation

Testing of hypothesis



The hypothesis tested the impact of value based education and excellence in engineering on industry readiness of students.

During interview and discussions with HR personnel of recruiting organizations, it was revealed that, in addition to the

technical knowledge the candidates are assessed for values or personality attributes also. These values reflect in their performance and are evaluated on the basis of their participation and contribution in various activities mentioned in table

Table4: Contribution of Values / Personality Attributes in Performance

Attributes	Contribution	
Team Work	Leadership & cooperation	Any post held in any club or social service group (like monitor, president, secretary etc.) in school, college, NCC, NSS, scout, guide, technical or cultural clubs, events Participation & organization of team events like projects, sports, cultural activities, technical competitions etc.
Integrity	Reliability & responsibility	Organising social, technical events & funds management
Discipline and efficiency	Self motivation & standard of work	Initiative & participation in activities over & above academics, hobbies, performance in competitive examinations like GATE, GRE, TOEFL, CAT/MAT/XAT, scholarship exams etc., participation in social service activities, consistency in their performance etc.

**Table
5:**

Criteria for Selection in Campus Placement Drives

Sr. No	Parameter	Past Performance Weightages	Present Performance Weightages	Total Score Total
1	Team Work	5	5	10
2	Integrity	5	5	10
3	Discipline and efficiency	5	5	10
4	Academic performance	10	10	20



Total	50
--------------	-----------

It is also

found that the tentative weightages given to different values or attributes during campus drives are like that given in table and minimum 50% score (i.e. 25 out of 50) is required for getting selected in these drives.

From table 4 & 5, it is inferred that value based education and excellence in engineering academics is important for getting selected in campus placement drive.

Hence the hypothesis which states that industry readiness of students is dependent on value based education and excellence in engineering is accepted.

Conclusion : From the above findings it has been concluded that:

1. The performance of students in other academic inputs, industry institute interaction, leadership qualities show strong positive

effect on their performance in campus placement drives.

2. The performance of students in B.E. III year Score and MH-CET Score, literary activities have also shown moderately positive effect on their performance in campus placement drives.
3. The performance of students in SSC examination, sports, cultural and co curricular activities does not show any significant relationship with performance in placement drives.
4. During personal interview in HR rounds, graduates are assessed for their various personality attributes like discipline, team work, integrity, efficiency etc. through their participation and performance in various technical and non technical activities which take place during their academic life. This indicates that these values play an important role in the selection process.



References:

- Alpay, E; Ahearn, A. L.; Graham, R. H. & Bull, A. M.J., (2010), “*Student Enthusiasm for Engineering: Charting Enthusiasm for Engineering: Charting Changes in Student Aspirations And Motivation.*” European Journal of Engineering Education, Volume 33, Issue 5, 573-585.
- Aspiring Minds, (2011), *Report on National Employability study IT/ITeS sector.* http://www.aspiringminds.in/docs/national_employability_report_engineers_2011.pdf (Browsing date 10th september 2017)
- Aspiring Minds, (2014), *Report on National Employability study IT/ITeS sector.* <https://www.aspiringminds.com/research-reports/national-employability-report-for-engineers-2014/>(Browsing date 8th september 2017)
- Avramenko A, (2012), “*Enhancing Students' Employability Through Business Simulation.*” Education & Training, Vol. 54 Issue: 5 pp. 355 – 367.
- Baillie, C. & Fitzgerald, G. (2010), “*Motivation and Attrition in Engineering Students.*” European Journal of Engineering Education, Volume 25, Issue 2, 145-155.
- Bholra, S. S. and Dhanawade, S. (2013), “*Higher Education and Employability - A Review.*” SSRN Electronic Journal: <https://ssrn.com/abstract=2290103>.
- Blom A. and Saeki H.(2011), “*Employability and Skill Set of Newly Graduated Engineers in India.*” Policy Research Working Paper 5640, The World Bank South Asia Region Education Team, 1-58.

