ANALYSIS OF ENTREPRENEURIAL MINDSET IN ENGINEERING STUDENTS

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ABSTRACT

In current scenario there is strong requirement to develop Entrepreneurial mindset in engineering student. A simple method to analyses the level of existing competence among the students is to conduct Dermatoglyphics Multiple Intelligence Test of the students. DMIT test can help to get insight of the inmate characteristics of students to start Enterprise as career option. Along with DMIT Psychometric test based on questionnaire is also conducted to analyses their mindset depending upon their preconditioning and belief system. In the present work a sample of 90 students were taken and DMIT and Psychometric test was conducted on them. After the test an Entrepreneurship training program was conducted for these students. To validate the results again DMIT test and Psychometric test was conducted for these students. Test results of DMIT and psychometric analysis were carefully recorded and analyzed.

KEYWORDS— *Entrepreneur, Learning Style, Education, Entrepreneurial Mindset*

I.   INTRODUCTION

Fingerprints are formed in the womb of the mother and they can be utilized to identify the learning style of the student. There are four general patterns of fingerprint i.e. whorl, loop, arch, and accidental as shown in figure 1. Ridges on the skin of palm and toes begin to form in after 13th week embryo grows in maternal body. The formation of these patterns i.e. dermal lines will complete during the 24th week. Once fully developed the dermal patterns remains unchanged for the whole life. The formation and analysis of these patterns is correlated with development of brain and learning style of an individual.
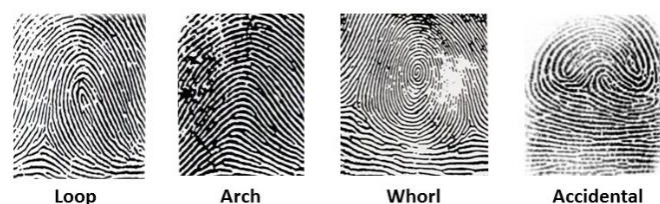

Figure 1 General types of fingerprints

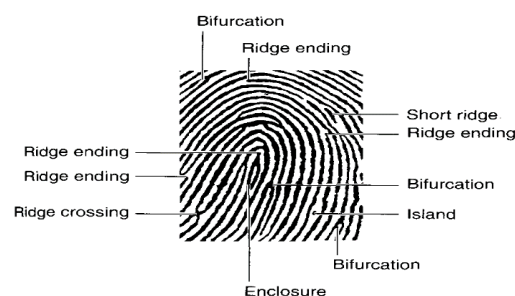Figure 2 shows the typical characteristics of fingerprint.

Figure 2 Characteristics of fingerprints

A. Career Options: Job/Business/Arts, Sports & Others

Dermatoglyphics refers to the branch of science in the study of the patterns of skins on the fingertips. Its reveals the genetic links between our fingers and our intrinsic qualities and talents. DMIT test is a Scientific process that uses our fingerprints reveal to us what we need and how we learn, transforming our lives through a holistic development approach. DMIT test is the 'Mother of all Tests', as it covers the features of Aptitude, I.Q. and any other Psychometric test and offers the most comprehensive analysis. Understanding of the behaviour and thought processes of the students can be done using DMIT. The Social Skills, Ability to Introspect, Logic and Reasoning, Visual and Spatial Judgement, Control over Body Movements, command over language and Comprehension skills are very important to get the right set of subjects one can benefit from. Choosing the right subjects using DMIT is important to get the career decision right on the basis of innate strengths and intelligence. The DMIT analysis helps in making the decision of suitable job profile and work environment, it also ensures success in the chosen career without any social pressure. Career counsellors also use psychometric assessment to understand the personality and interests of the students and assess their skill set to find a suitable career path. These tests are also used by recruitment agencies to determine if the candidate is suitable for a particular job. Both DMIT and psychometric analysis are carried out in present work for understanding the mindset of the students.

Rest of the paper is divided into different sections for the ease of understanding. Section II focuses on the related work done in this field. Section III depicts the proposed model and section IV provides the results and discussion. At the end, conclusion of the work has been given along with the future scope in section VI.

II.   RELATED WORK

Borchers, Andrew & Park, S.A. in their paper titled "With growing interest in entrepreneurship in higher education, faculty are facing increased calls to instill an "entrepreneurial mindset" in students. They also collected paired data from students before and after taking a course in innovation and new ventures. Along with basic analyses using correlation and paired sample t-tests, they performed confirmatory factor analysis and a Multi-Group SEM to test the effects of LOC on the link between ESE and ITSB [1]. Valentina Ndou et.al in their study gave "black box" of "how, when, why and what" entrepreneurial mindset and competencies in the field of technology entrepreneurship are learned over time in the Entrepreneurship Centers. This analysis provides the basis to introduce a process-based framework for entrepreneurial mindset creation in EE that is organized around four main phases: inspiration, engagement, exploitation and sustainment [2]. S. Lam-Lam described a general overview of basic concepts that coincide with the point of view of several researchers on the subject of social entrepreneurship, the characteristics, personality traits and the entrepreneurial process within a social context, the possible challenges and how to overcome them. They also suggested how these capabilities and competences can be used become a social entrepreneurs [3]. M. F. Lee et.al. in their paper suggested Job performance of an individual can be predicted through personal highlighted. Capable of predicting job performance is benefiting from all perspectives. Job performance in this study refer to the abilities of students in completing the task given by lecturer [4]. J. h. Bao focused their research on the entrepreneurial process and behavior instead of the personality traits of the entrepreneur. Distinguished from ordinary business operations, entrepreneurial activities are actions taken by entrepreneurs who identify, evaluate and exploit opportunities in the conditions of uncertainty [5]. From the above literature survey, it was observed that it is important to instill entrepreneurial mindset in engineering students. Section 3 proposes a novel model to analyze and get an insight of preferential career option for engineering students.

III.   PROPOSED MODEL

The proposed model requires that the data of total number of students is entered into the database. The proposed system will check the fingerprints of each student and analyze its preferential career option. Each student will be categorized into one of the three career options and put into 3 groups. Finally a database of all the students will be prepared according to their psychometric test and students will be categorized into 3 groups.

A. Preferential career assesment

In proposed system all the students database will be prepared according to their preferential career option and will be grouped accordingly [6-7]. The proposed system will analyze the entrepreneurial mindsets of students with the help of DMIT test and psychometric test. The test will be repeated for the same set of students after giving them one-week training of entrepreneurship. Again, both tests i.e. DMIT and psychometric analysis will be carried out for all the students and comparative analysis of change in their mindset after and before the training will be carried out.
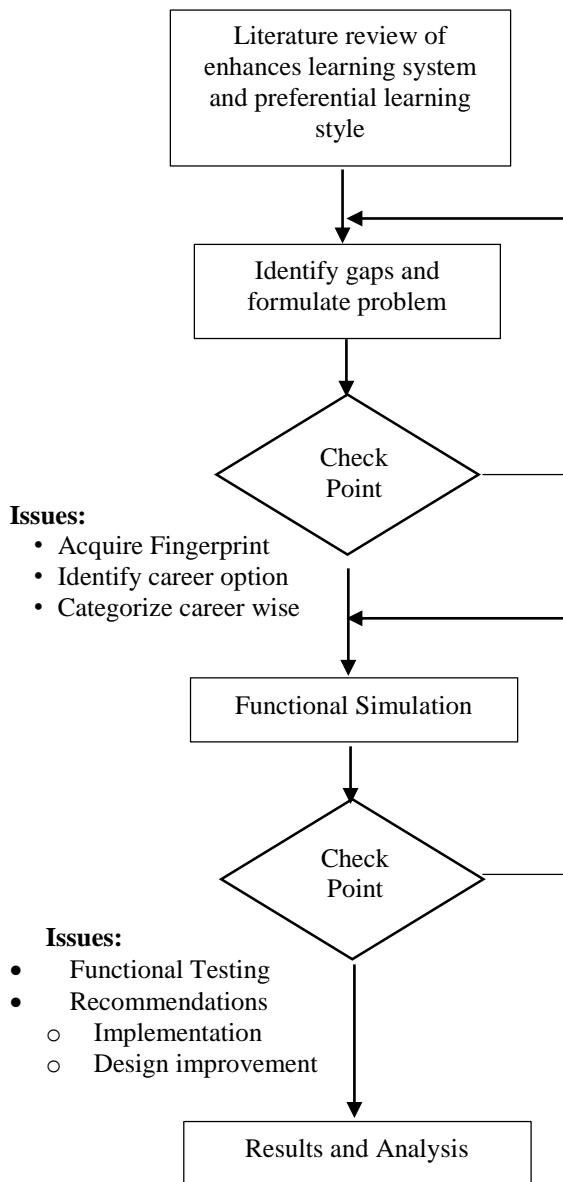
Figure 3 Analysis and validation process flow of proposed design of automated enhanced learning system

B. Experimental setup

The proposed system is implemented using Arduino Uno based embedded system. The figure 4 shows the fingerprint sensor (FPM10A fingerprint module) and Arduino board with necessary pin descriptions.
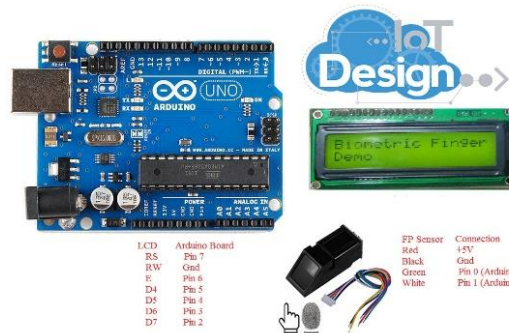
Figure 4 Main components of proposed model [11]

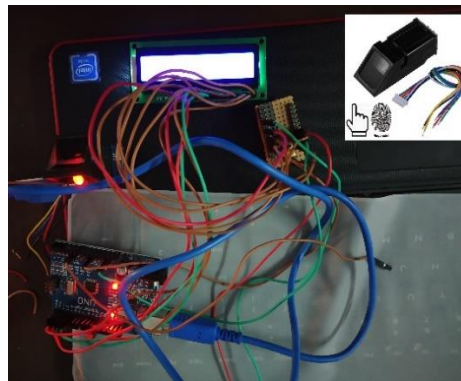Whereas figure 4 shows the experimental setup to implement the proposed model.

Figure 5 Experimental setup of proposed model [11]

IV.   RESULTS & DISCUSSION

A group of 90 engineering students were taken and the setup was used to acquire their fingerprints and classify them according to their learning abilities [9-12]. After that psychometric test based on questionnaire was conducted for same students. Sample fingerprints of 20 students and their data is given in table 1 and table2 respectively.

Table 1 Sample fingerprint of students and fingerprint type

S.No.	Name	Fingerprint	Type
1.	Priyanshu		Whorl
2.	Utsav		Loop
3.	Gaurav		Loop
4.	Adarsh		Whorl

5.	Aamir Zaman		Loop
6.	Himanshu		Whorl
7.	Jai Arora		Whorl
8.	Abhinav		Arch
9.	Kushal		Arch
10.	Arbaz		Arch
11.	Yugansh		Loop
12.	Saurabh		Loop
13.	Zeafaham		Whorl
14.	Paramdeep		Loop
15.	Faizan		Loop
16.	Nivedita		Loop
17.	Payal		Whorl
18.	Bhasker		Loop
19.	Atul		Loop

20.	Anubhav		Whorl

Students categorized into 3 groups as per the career options as given in table 2.

Table 2 Career distribution based on DMIT

S.No.	Name	Job	Business	Arts, Sports & others
1.	Priyanshu	39.68	42.33	17.99
2.	Utsav	32.91	34.84	32.25
3.	Gaurav	39.68	42.33	17.99
4.	Adarsh	40.75	30.94	28.3
5.	Aamir	36.94	32.84	30.22
6.	Himanshu	43.6	30.4	26
7.	Jai Arora	40.45	26.97	32.58
8.	Abhinav	27.43	33.14	39.43
9.	Kushal	42.86	25.97	31.17
10.	Arbaz	34.05	23.5	42.45
11.	Yugansh	28.3	30.94	40.75
12.	Saurabh	34.84	32.9	32.26
13.	Zeafaham	60.45	19.4	20.15
14.	Paramdeep	38.53	29.35	32.12
15.	Faizan	36.66	28.66	34.68
16.	Nivedita	27.43	33.14	39.43
17.	Payal	37.88	29.35	32.76
18.	Bhasker	30.65	40.54	28.81
19.	Atul	40.93	30.58	28.49
20.	Anubhav	32.14	35.71	32.14

Distribution of students as per their innate charachterstics in to three career options is shown in figure 6.
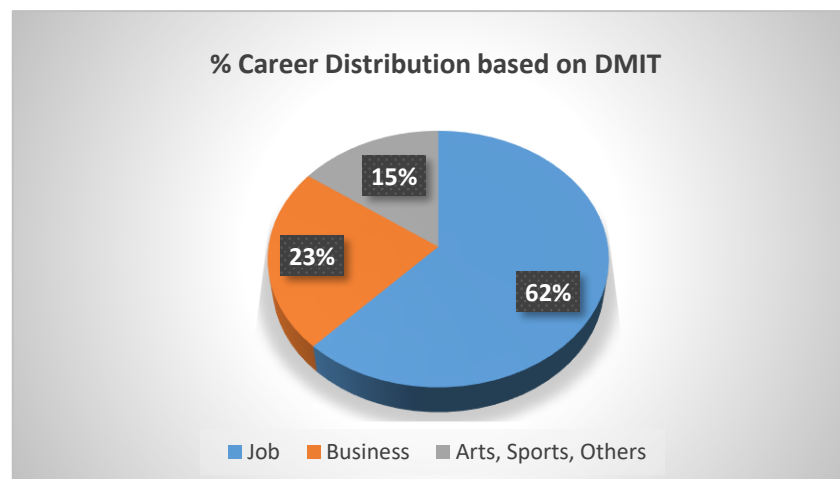
Figure 6 percentage career distribution of students into groups based on DMIT

The preferential career option for the students based on DMIT analysis categorized in to three groups i.e. job, business, arts/sports/others is given in Figure 6. From results depicted in figure 6, it is evident that psychometric results shows that for majority students (62%) the career option is getting a job type whereas 15% of the students can pursue other career options such as sports/arts/others and 23% students have innate potential to take entrepreneurship as career option.

With the help of psychometric test the data acquired (table 3) was analyzed and the students were divided into 3 groups as per the preferential career options.

Table 3 Career distribution based on Psychometric Analysis

S.No.	Name	Job	Business	Arts, Sports & others
1.	Priyanshu	42.33	28.75	28.92
2.	Utsav	34.84	32.91	32.25
3.	Gaurav	40.93	30.58	28.49
4.	Adarsh	40.75	30.94	28.3
5.	Aamir	40.45	26.97	32.58
6.	Himanshu	43.6	30.4	26
7.	Jai Arora	58.52	21.33	20.15
8.	Abhinav	34.05	23.5	42.45
9.	Kushal	42.86	25.97	31.17
10.	Arbaz	36.66	28.66	34.68
11.	Yugansh	28.3	30.94	40.75
12.	Saurabh	34.84	32.9	32.26
13.	Zeafaham	36.94	32.84	30.22
14.	Paramdeep	38.53	29.35	32.12
15.	Faizan	42.33	17.99	39.68
16.	Nivedita	52.94	21.16	25.9
17.	Payal	37.88	29.35	32.76
18.	Bhasker	40.54	30.65	28.81
19.	Atul	27.43	33.14	39.43
20.	Anubhav	27.43	33.14	39.43
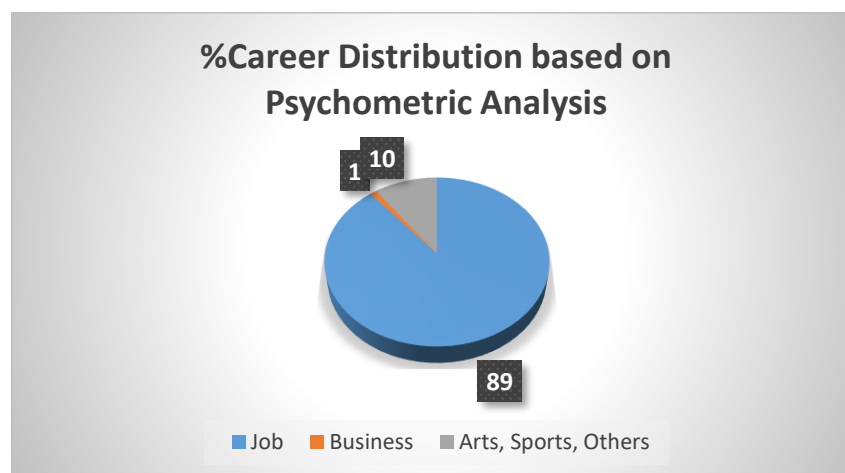
Figure 7 percentage career distribution of students into groups based on Psychometric Analysis

The preferential career option for the students categorized in to three groups i.e. job, business, arts/sports/others is given in Figure 7. From results depicted in figure 7, it is evident that psychometric results shows that the career option is getting a job type whereas 10% of the students are interested in pursuing other career options such as sports/arts/others and only 1% students are interested in taking entrepreneurship as career option.

Table 4 *Career distribution based on DMIT after one week training on Entrepreneurship*

S.No.	Name	Job	Business	Arts, Sports & others
1.	Priyanshu	36.94	32.84	30.22
2.	Utsav	32.91	34.84	32.25
3.	Gaurav	39.68	42.33	17.99
4.	Adarsh	40.75	28.3	30.94
5.	Aamir	39.71	42.30	17.99
6.	Himanshu	43.6	30.4	26
7.	Jai Arora	40.45	26.97	32.58
8.	Abhinav	27.43	33.14	39.43
9.	Kushal	42.88	25.97	31.15
10.	Arbaz	34.05	23.5	42.45
11.	Yugansh	28.3	30.94	40.75
12.	Saurabh	34.84	32.26	32.9
13.	Zeafaham	60.45	19.4	20.15
14.	Paramdeep	38.53	29.35	32.12
15.	Faizan	36.66	28.66	34.68
16.	Nivedita	27.43	33.14	39.43
17.	Payal	37.88	29.35	32.76
18.	Bhasker	30.65	40.54	28.81
19.	Atul	40.93	30.58	28.49
20.	Anubhav	32.14	35.71	32.14

Table 4 shows the sample students (20 out of batch of 90) categorized into 3 groups after DMIT as per the career options.
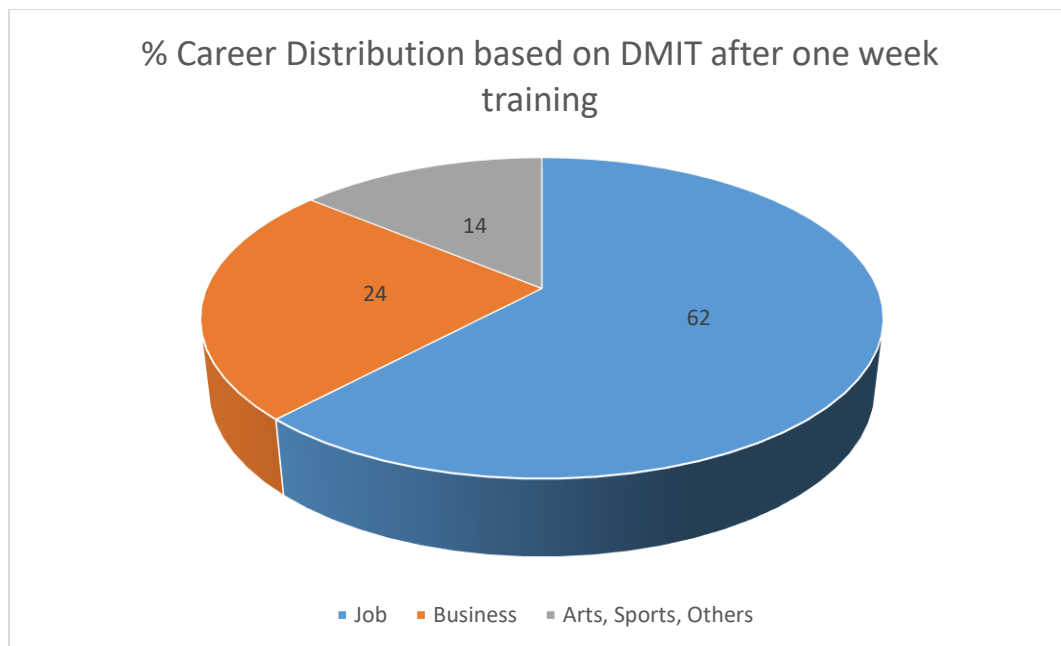
Figure 8 percentage career distribution of students into groups based on DMIT after one week training on Entrepreneurship

Figure 8. shows preferential career option for the students based on DMIT analysis categorized in to three groups i.e. job, business, arts/sports/others after providing one-week training on Entrepreneurship. From results depicted in figure 8, it is evident that there is no significant change in results of DMIT analysis after the training.

Table 5 Career distribution based on Psychometric Analysis after one week training on Entrepreneurship

S.No.	Name	Job	Business	Arts, Sports & others
21.	Priyanshu	35.28	31.29	33.43
22.	Utsav	31.88	35.54	32.58
23.	Gaurav	38.62	36.26	25.12
24.	Adarsh	37.06	35.26	27.68
25.	Aamir	34.12	42.95	22.93
26.	Himanshu	35.23	37.56	27.21
27.	Jai Arora	38.28	34.73	26.99
28.	Abhinav	28.59	35.89	35.52
29.	Kushal	43.56	31.52	24.92
30.	Arbaz	35.68	28.51	35.81
31.	Yugansh	38.69	31.2	30.11
32.	Saurabh	35.03	33.17	31.8
33.	Zeafaham	38.69	42.03	19.28
34.	Paramdeep	38.53	30.25	31.22
35.	Faizan	36.52	24.56	38.92
36.	Nivedita	26.69	34.61	38.7
37.	Payal	39.82	35.19	24.99
38.	Bhasker	33.46	41.52	25.02
39.	Atul	39.51	36.25	24.24
40.	Anubhav	38.12	37.65	24.23

Table 5 shows the sample students (20 out of batch of 90) categorized into 3 groups after psychometric test as per their preferential career options.
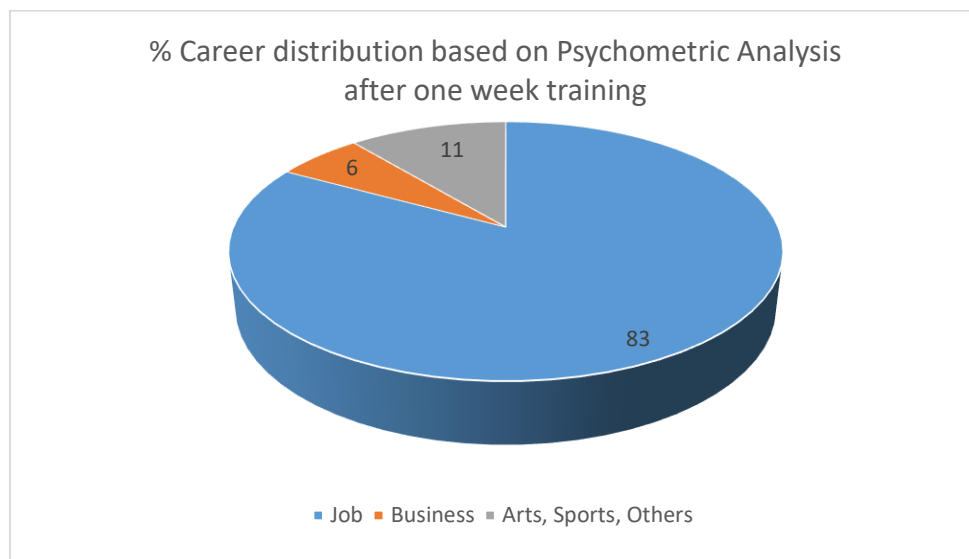

Figure 9 percentage career distribution of students into groups based on Psychometric Analysis after one week training

Figure 9. shows preferential career option for the students based on Psychometric analysis categorized in to three groups i.e. job, business, arts/sports/others after providing one-week training on Entrepreneurship. From results depicted in figure 9, it is evident that there is significant change in mindset of the students after getting one-week training on entrepreneurial skills. The percentage students interested in entrepreneurship has increased from 1% to 6%.

V.   CONCLUSION

DMIT and psychometric based assessments of the students can play an important role in developing entrepreneurial mindset of the students. This will improve the teaching learning process as teaching methodologies will be molded as per the analysis of the students. Students will be able to learn, understand and correlate subject in better way. The proposed technique will help educators in developing entrepreneurial mindset in students leading to better contribution of Engineering graduates to society. By the proposed approach the faculty member can easily assign the tutorials/ home assignments to the students depending upon their innate learning style. The proposed system can be further improved by training the software and providing the feedback of learning from the students.

VI.   FUTURE SCOPE

As the focus of universities and higher regulatory bodies is shifting towards promoting the entrepreneurial mindset among the budding engineers. The proposed method of analyzing mindset of individual on basis of DMIT and psychometric test can become an important element. As this will help educators in understanding, grasping and having insight of the characteristics of the students and impact of their teaching methodology. The proposed system if adopted will become a game changer.

ACKNOWLEDGEMENT

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