

Constructing an Emotional Intelligence Radar for Indian Professional College Students

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Abstract

Emotional Intelligence (EI) is a subject of intensive investigations by academicians as well as human resources and management professionals both in corporate and consultancy. This study on EI highlighted ways to develop students that are personally meaningful, as well as constructive and meaningful for society along with guidelines for teachers and parents. This paper aims at constructing clusters based on the scores of EI, its factors and many other variables for a student's data of 752 (age group 21 – 27 years). As a result of development of clusters; four EI radars were formulated. EI radars developed for professional students could assist in increasing the effort by researchers, academicians, students and their parents to improvise EI scores.

Keywords: Radar, Emotional intelligence; Adaptability; Organizational development; Leadership, Ability models; Trait models.

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INTRODUCTION

The EI construct has important clinical and therapeutic implications because it has emerged from an amalgamation of research findings on how people appraise, communicate and use emotion (Salovey and Mayer, 1990). Goleman (1995) suggested that EI could predict academic success better than the traditional measures of intelligences. Zeidner et al. (2004) correctly pointed out that there hasn't been sufficient research to fully understand the impact EI has on academic success. On further research, it has been proved that there is conflicting evidence regarding the relationships between EI and academic success measured as grade point average (GPA). Possibility of greater variability in the measures of EI could have resulted in conflicting evidences. Using the Mayer - Salovey – Caruso emotional intelligence test (MSCEIT) has not observed any correlations between EI and academic achievement (O'Connor and Little, 2003; Bastian et al., 2005). In case of associations between EI and GPA, the results have been found to be inconsistent. In a study made by Parker et al. (2004) with the emotional quotient inventory – youth version (EQ-i -YV) significant correlations were found between 3 subscales – stress management, adaptability and intrapersonal EQ-i. However, overall EI scores did not correlate with GPA. Newsome et al. (2000) used the EQ-i measure and found no correlations between academic achievement and EI. Similarly, Petrides and Furnham (2004) examined the role of trait emotional intelligence on academic performance. They

tested in individuals with low intelligence quotient (IQ) relative to individuals with high IQ. The results suggested that trait EI was related to academic performance only in individuals with low IQ scores. Specifically the study concluded with stating that high trait EI was more important for academic success in individuals with low IQ. Similarly numerous studies were conducted examining the relationship between emotional intelligence and cognition (Barchard, 2003; Brackett and Mayer, 2003) personality (Bastian et al., 2005; Van der Zee et al., 2002) and academic transitions (Parker et al., 2006) of students.

The pioneers of EI also claim that family socialization practices determine the development of EI in children (Rubin, 1999; Schutte et al., 2001; Salovey, and Sluter, 1997). Parental socializations have been found to impact directly child's social and emotional competency as well as work indirectly on the understanding of emotions and gaining social knowledge (Zeidner et al., 2002). Parental socializations take effect through explicit lessons or informal conversations about regulation of emotion. Parental influences also occur through the child's observational capacity. The basic assumption is that a child whose parent displays constructive EI related behavior in everyday life is most likely to implement it as a part of its own behavior. In addition to parents, school setting is one of the most important contexts for learning emotional skills and competencies (Mayer and Salovey, 1997). In the process of emotional learning the individual develops the aptitudes, skills, attitudes and values necessary to acquire higher emotional intelligence. Mayer and Geher (1996) hypothesized that those who are low in emotional intelligence could be educated to recognize, express and regulate their feelings better. It is observed from the literature survey that many studies have been conducted to measure EI and its validity is tested with business organizations. We find a very little evidence of EI application for students in the age group 21-27 years. A restricted view of EI by students, parents, academicians and researchers could miss opportunities. A new framework of EI radar could possibly help avoid that. Therefore, the objectives of this paper are as follows:

- To develop clusters of students with factors of EI along with the demographic variables considered for the study.
- To develop a new framework termed as EI radar to assist students, parents, other stakeholders and academicians in improving EI scores of students. (age group 21 – 27 years)

LITERATURE REVIEW

EI as a field of extensive study and research emerged after Goleman's publication in 1995. But EI has its generic origin before. In the 17th century, Descartes discussed that a person's intelligence was responsible for creating knowledge and validating the truth (PSI Psychology tutor, 2007). He recognized that intelligence is at least partly responsible for what it is that makes each person unique. He also maintained that mind and body are separate entities. In the same century, another English philosopher - Locke believed that a person was born as a blank slate and that intelligence was the ability to reason built up over time by interactions with the environment (PSI Psychology tutor, 2007). Spinoza (1677) believed for the measurement of cognition, emotion and intellect together. He asserted that cognition comprised of emotional cognition, intellectual cognition and some level of intuition. Despite the introduction of the concept of 'intelligence', there was low empirical evidence and introduction of psychometric testing. Appendix- I summarize the sequence of evolution from 1900 –2011 chronologically. We can classify the sequence of continuous evolution of EI in four distinct phases explained in a time frame as depicted in Fig 1.

First Phase (1900 – 1919) Theme: Development of IQ Measurement Scale

This phase is the nascent stage of the development of intelligences. In this phase, 'intelligence' was explained. Intelligence testing began in earnest in France, when in 1904 psychologists Binet and Simon were commissioned by the French government to find a method to differentiate between children who were intellectually normal and those who were inferior. The purpose was to put the intellectually inferior students into special schools, where they would receive more individual attention. This led to the development of the Simon-Binet Scale. The test had children do tasks such as follow commands, copy patterns, name objects, and put things in order or arrange them properly. Binet gave the test to Paris school children and created a standard based on his data. For example, if 70 percent of 8-year-olds could pass a particular test, then success on the test represented the 8-year-old level of intelligence. Following Binet's work, the phrase 'intelligence quotient' or 'IQ' entered the vocabulary. The tests were soon available for widespread use. In 1916 Stanford and Binet modified the IQ test with the exclusion and inclusion of relevant components. Thurstone (cited in Gardner, 1983) believed the existence of a small set of primary mental factors that are relatively independent of one another and are measured by different tasks. Thurstone nominated seven such factors: verbal comprehension, word

fluency, numerical fluency, spatial visualization, associative memory, perceptual speed and reasoning. Identifying these flaws in IQ, psychologists researched further.

Second Phase (1920 – 1972) Theme: Expansion of the Theories of Intelligence

This was the developmental phase of intelligences. This phase markedly showed a lot of research conducted on the development of IQ, introduction of personality parameters and social intelligences. The roots of EI can be traced back to the concept of 'social intelligence' coined by Thorndike (1920) to refer to the ability to understand, manage and act wisely in human relations. Thorndike (1920) first identified the concept of 'social intelligence' (SI). He defined SI as the ability to understand and manage men and women, boys and girls - to act wisely in human relations. From 1920 through 1937 (cited in Thorndike and Stein, 1937), seven of the ten published studies discussed a measure of SI known as the George Washington SI test, developed by Moss and his colleagues at George Washington University. Thorndike and Stein (1937) criticized the test as there was no data to indicate impact of personality, interests, or academic / abstract intelligence from the social intelligence scores. In addition, the test was found to be heavily loaded in verbal ability resulting in its similarity to the existing measures of academic intelligence. These 17 years were the only serious attempt to measure social intelligence, which unfortunately did not succeed.

Wechsler (1940) observed the impact of non-cognitive and cognitive factors of what he referred as 'Intelligent behavior'. Maslow (1954) wrote about the enhancement of emotional, physical, spiritual and mental strengths in people. His work set to life the 'Human Potential Movement' and to the development of many new sciences of human capacity in the 1970s and 80s. Other researchers Cattell and Butcher (1968) tried to predict both school achievement and creativity from ability, personality, and motivation. The authors succeeded in showing the importance of personality in academic achievement. Studies to more fully assess the relative importance of both ability and personality variables in the prediction of academic achievement were also conducted. There was identification of cognitive as well as non-cognitive behavior. Researchers succeeded in showing the importance of personality in academic achievement. One contribution of this stage: Ability as well as trait personality dimensions are responsible for individual's success.

Third Phase (1973 – 1995) Theme: Development of EI

There is an identification of limitations of cognitive abilities in an individual in this phase. Existence of multiple intelligences in an individual is identified and concluded with the introduction of EI. McClelland (1973) launched an entirely new approach to the measure of intelligence proposing a set of specific competencies including empathy, self-discipline and initiative. Research in seventies focused on high academic achievement and the reasons for the same. Gardner (1983) discussed intelligence to entail a set of skills of problem solving – enabling the individual to genuine problems or difficulties that one encounters when appropriate to create an effective product. It must also entail the potential for finding or creating problems that lays the groundwork for the acquisition of new knowledge. Gardner (1983) includes intrapersonal and interpersonal intelligences in his theory of multiple intelligences. Intrapersonal intelligence includes attributes leading to self-understanding and mastery with awareness of feelings, psychological insight, ability to manage emotions and behave in ways that meet ones needs and goals (Gardner, 1983; 1993; Goleman, 1995). Interpersonal intelligence involves social competence with the capacity for empathy, altruism, and emotional intimacy (Gardner 1983, 1993; Goleman, 1995).

Gardner (1983) proposed that there are seven primary types of intelligence: verbal, mathematical-logical, spatial, kinesthetic, musical, intra physical abilities (insight, inner contentment) and personal intelligences. The personal intelligences consist of interpersonal intelligence, the ability to understand others, and intrapersonal intelligence, the ability to develop an accurate model of the self and use it effectively to operate throughout life. Gardner (1983) noted that the IQ tests have predictive power for success in schooling but relatively lesser predictive power outside the school context. This is applicable especially when more potent factors like social and economic back ground are considered. Gardner introduced his theory of the various frames of mind, which opened doors to other theories. Triarchic theory as developed by Sternberg (1985) stated that in addition to academic performance, adaptation to environment, experience and the internal world of the individual was equally important. The triarchic theory comprised the following:

- a. Intelligence and the internal world of the individual
- b. Intelligence and experience and
- c. Adaptation to the environment

Each part of the theory highlights a different aspect of intelligence that is applicable to different groups as well as individuals. Sternberg's theory also included the concept of practical intelligence (Sternberg, 1993; Sternberg et al., 1995). Practical intelligence depends on tacit knowledge that is acquired through day-to-day practical experiences and is basically – what to do in a given situation. Sternberg's theory focuses beyond the cognitive aspect of intelligence and acknowledges Meta intelligence comprising of social, practical and emotional aspects. The theories of Gardner and Sternberg were seen as expansive theories of intelligence and with these base researchers on EI have considered system theory account of intelligence more than the cognitive theories.

The first of the three major theories on EI to emerge was that of Bar-On (1988). In his doctoral dissertation he coined the term emotional quotient (EQ), as an analogue to intelligence quotient (IQ). In 1990, Salovey and Meyer described that over the last few decades the beliefs about emotions and intelligence have both changed. Intelligence was once perfection, and the people soon recognized that there was more than intelligence to life. Whereas emotion was once perdition and people were recognizing that it might have substantive value. Goleman published his famous book on EI 'Emotional Intelligence: 'why it can matter more than IQ' in 1995 which lead to mass awareness. Additionally a paper published in Harvard Business Review vitalized the concept. Thereafter, articles on EI began to appear with increasing frequency with empirical work on the construct along with scientific theoretical literature with academic interests. Any science has its detractors and no science is complete without its fair share of them. EI pioneers founded their theories at different times and on a different platform. Salovey and Bar-On framed their theories as general theories of social and EI and EI respectively, Goleman's theory is specific to the domain of work performance. Salovey and Mayer's theory along with Bar-On's theory was considered for its suitability in children and adolescents.

Fourth Phase (1996 – 2008) Theme: Corporate Cognition

The theme of the fourth phase is "corporate cognition". Cognition is a concept used in different ways by different disciplines, but is generally accepted to mean the process of thought. Path-breaking introduction of EI marked this phase. Many accreditation programs, corporate training programs, training students have been developed to enhance cognitive as well as non-cognitive skills of individuals. EI is being recognized as a set of competencies to develop leaders and decision makers. Emotionally intelligent leadership appears to be one key contributor to the development of a psychologically healthy workplace. Leaders are directly influencing morale, retention, commitment, satisfaction and perceptions of stress. A variety of approaches are being tried by corporations to consider deploying EI in the development of a healthy workplace. Six Seconds in USA and Javelina's A and M Texas University has programs devised for enhancing the EI of students. Formation of a consortium for research on EI for the western countries and FEIL (Forum of Emotional Intelligence and Learning) in India concentrates on research, education, corporate training and generating social awareness of EI. The next section describes the research design for our study.

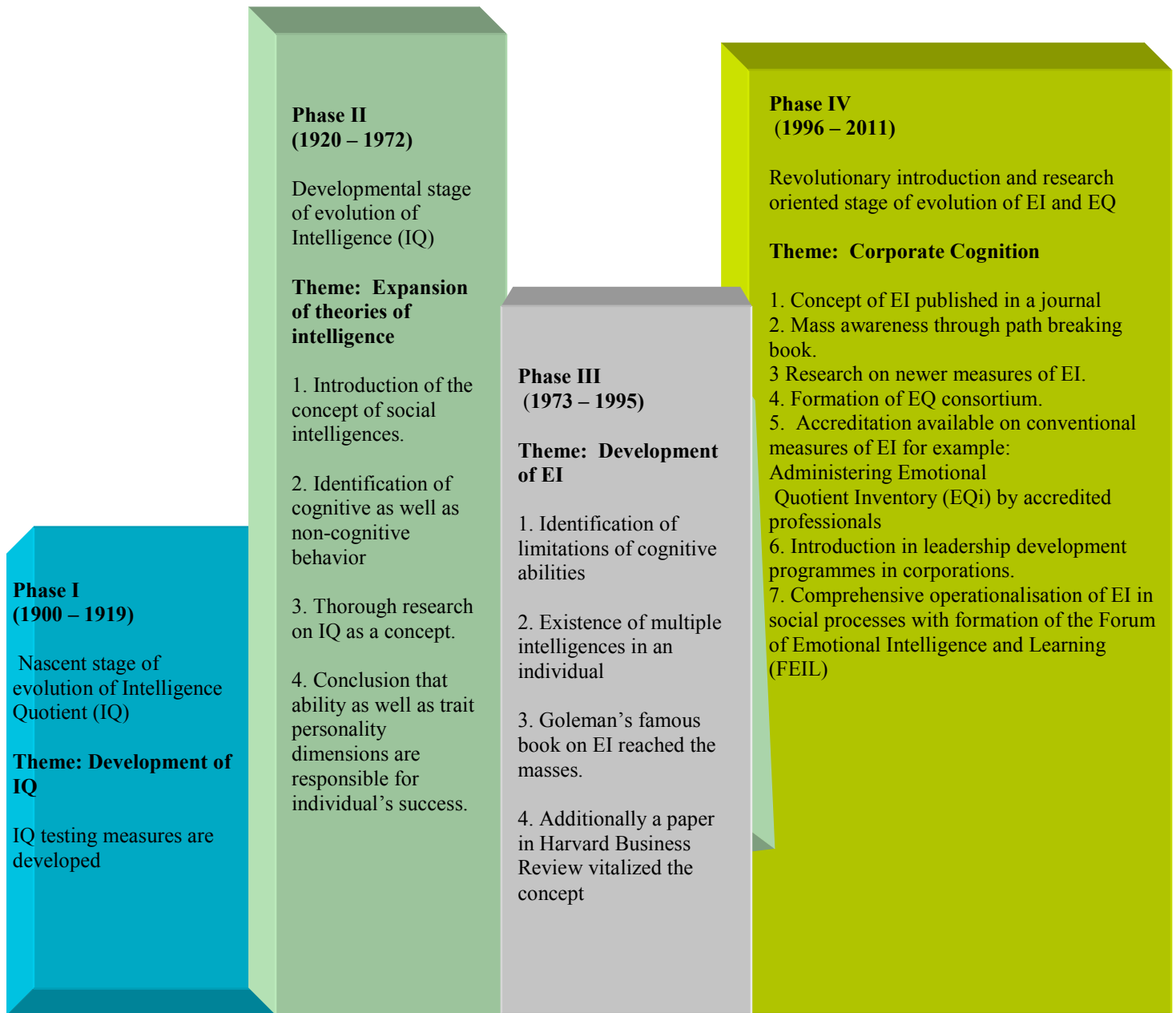


Fig 1: Stages of Development of EI

Factors affecting EI for professional students

There are two models of EI – Ability models and Mixed models. Intelligence involving emotions constitute the Ability models (cited in Goldenberg et.al 2006). Such models define EI in a traditional sense (e.g. Mayer and Salovey 1997). They are a concept comprising a set of mental abilities with emotions and processing of emotional information. The essential elements of the ability model are Emotional perception and expression, emotional facilitation of thinking, emotional understanding and emotional regulation. In contrast, mixed models have EI as partly or wholly a personality-like trait. Mixed models make references to abilities in the processing and use of emotional information. Also there is a combination with other traits and characteristics such as optimism, motivation and social relationships (Bar-On, 2000, 2001; Goleman 1995, 1998). However Matthews (2003) noted that mixed models do not relate to the concept of emotion specifically.

Bar- On (2000) has identified 5 factors namely intrapersonal ability, interpersonal ability, stress management, adaptability and general mood. This study has factors outlined by Bar-On and the relationship of emotional intelligence

with interpersonal ability, intrapersonal ability, stress management, adaptability and general mood with Indian students of professional colleges is tested. Intrapersonal ability consists of the ability to identify feelings correctly, recognizing and labeling one's feelings. Interpersonal ability deals with the relationship with peers, subordinates and superiors, identifying emotions of others and being empathetic. Stress Management consists of abilities like responding to a stressful event without an emotional outburst. Adaptability involves skills related to management of change and of abilities like being to adjust one's emotions and behavior to changing situations or conditions. General mood is the ability to enjoy life and maintain a positive disposition. This study involves usage of these five factors which are described in the subsequent sections.

RESEARCH DESIGN

This study is exploratory in nature and four clusters are formed. Cluster analysis leads to the formation of an EI radar and EI Competency ladder.

Participants

The sample size comprised a total number - 761 students from 7 different types of professional colleges. 9 students did not complete the main battery of measures could not be considered hence the main sample size reduced to 752 students – all of them belonging to age groups 21- 27 yrs. 434 (57.712%) of respondents were male and 318 (42.288%) female.

Data of students in the age group of 21 – 27 years was collected from management institutes, engineering colleges and colleges providing Master’s in Computer Application degrees. Two institutes provided residential courses and three institutes provided autonomous education.

The criterion for classification for students (21 – 27 years) based on the courses offered by institutes, boarding type of students and differentiation of college students is shown in Table 1. These students represent diverse socio – economic background characterized by upbringing of students with differing levels of parental literacy, parental occupation and family income. The criterion for classification based on parental characteristics as shown in table 5.4 in section 5.4.1 is also considered for this sample of students (aged 21 – 27 years).

Table 2 depicts the category wise classification statistics for students (21 – 27 years) (n = 752) based on their gender, occupation of father and mother along with literacy levels of father and mother. Lastly the count of students based on family income is also considered. Ratio analysis revealed that of 623 MBA students, 53.4% were males. Of the 83 MCA students, 68.67% were males and of the 26 Engineering students, 92.3% were males. When open workshops were conducted, MBA students were more interested than MCA and engineering students.

A covering letter was drafted to the head of the institution –college and school, which included general information about the research work and instrument - purpose of the study, confidentiality of the responses and request for returning the filled questionnaire. Administering questionnaires from February to September 2008 collected data. A workshop for students along with personal interviews for teachers and the principal were two additional activities that were conducted.

Procedure

Participants were asked if they would volunteer to study on "emotional intelligence" Participants completed the Bar-On Emotional quotient inventory (2000). Professional college students were also asked to complete the EQi after their lecturing hours in the premises of their institute. In exchange for their participation, individuals were provided with a confidential feedback report on their results of the instrument.

Table 1: Criteria for Classification for Students (21 – 27 years)

Criterion	Type
Degree/Diploma offered by institutes	University approved courses – AICTE approved autonomous diploma
Boarding	Residential – Non residential
Program	Management – Engineering - Computer application

Table 2: Classified Data of Students' (21 – 27 years) of 752 Samples

Criteria	Total number of Students	MBA Students	MCA Students	Engineering Students	Residential Students	Non Residential students	Mumbai University Affiliated colleges	AICTE Approved Autonomous Institutions
Male	434	333	57	24	196	238	224	210
Female	318	290	26	2	69	249	208	110
Father's occupation								
0	7	5	2	0	1	6	4	3
1	132	101	29	2	18	114	54	78
2	146	95	42	9	18	128	82	44
3	397	293	94	10	116	281	209	188
4	69	44	20	5	20	49	34	35
Mother's occupation								
0	2	1	1	0	0	7	1	1
1	688	505	161	22	167	521	345	343
2	50	25	22	3	6	44	32	18
3	5	4	1	0	1	4	1	4
4	7	4	3	0	0	7	4	3
Father's Literacy level								
1	225	188	35	2	85	140	76	149
2	457	308	127	22	70	387	269	188
3	70	43	25	2	19	51	38	32
Mother's Literacy level								
1	431	347	66	18	126	305	182	249
2	309	185	116	8	47	262	194	115
3	12	7	5	0	1	11	7	5
Family Income								
Upto 1,00,000	752	539	187	26	174	578	383	369
1,00,000 to 5,00,000	161	119	40	2	21	140	69	92
Above 5,00,000	254	194	57	3	54	200	129	125

Measures

EI for students in the age group of 21 -27 years was measured using Bar - On (1997^b) which consists of 133 statements measuring five EI factors: intrapersonal EQ-i, interpersonal EQ-i, adaptability EQ-i, stress management EQ-i and general mood EQ-i. The EQ-i is further divided into fifteen sections. The first, intrapersonal EQ-i includes measures of self-awareness, self-actualization and independence, the ability to assert oneself, and the ability to view oneself positively. The second, interpersonal EQ-i includes such skills as empathy, interpersonal relationships and social responsibility. The third, stress management EQ-i, includes skills such as stress tolerance and impulse control. The fourth, adaptability EQ-i includes flexibility, problem solving and reality testing. Finally, general mood EQ-i includes happiness and optimism. Responses are rated by the participant on four-point Likert scales, ranging from 1 for "very seldom or not true of me," to 5 for "very often true or true of me." The final item is a self – report on honesty of responding and is not included in any scale. The scales and subscales are intrapersonal EQ-i (emotional self – awareness, assertiveness, self –regard, self – actualization, independence); interpersonal EQ-i (empathy, interpersonal relationships, social responsibility); adaptability EQ-i (problem solving, reality testing, flexibility); stress management EQ-i (stress tolerance, impulse control); general mood EQ-i (happiness, optimism). Higher scores indicate a higher level of emotional intelligence. EI scores were derived by using item scales as given in the manual.

Computation of EI Scores

As per the technical manual of the EQi the scores of students were computed. Data sheets were compiled in Microsoft excel sheets and finally data was analyzed using the SPSS 11.5 for MS Windows.

Descriptive Statistics

As per guidelines provided by Multi Health Systems the scores of students were computed and results compared with findings by Hemmati et al. (2004)

Table 4: Statistics for Students in the Age Group of 21 – 27 years

	Minimum		Maximum		Mean		Std. Deviation		Std. error	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
Age	21	21	27	27	24.41	23.55	1.15	1.11	0.28	0.34
EI	76	79	130	130	94.18	96.9	14.68	13.51	0.26	0.31
Intrapersonal EQ-i	123	124	165	165	97.85	96.32	14.42	14.02	0.28	0.34
Interpersonal EQ-i	92	91	122	123	90.06	90.88	16.94	17.98	0.26	0.31
Stress Management EQ-i	42	44	80	81	88.31	87.55	13.47	12.54	0.03	0.03
Adaptability EQ-i	65	65	111	111	95.22	97.73	16.43	16.78	0.26	0.32
General mood EQ-i	51	52	69	75	87.92	88.54	15.09	15.87	0.26	0.31

- EI and its factors had 65 as lowest score.
- In case of EI, intrapersonal EQ-i and adaptability EQ-i scores are 120, 165 and 111 respectively.
- In case of general mood EQ-i the maximum score is 75.

Stress management EQ-i and interpersonal EQ-i have maximum score of 81 and 123 respectively.

Cluster Analysis

Cluster Analysis is a multi-variate procedure (Nargundkar, 2002) is a group of similar objects. Cooper and Schindler (2007) have identified five basic steps:

- Selection of sample to be clustered.
- Definition of the variables on which to measure the objects.

- c. Computation of the similarities through correlation.
- d. Selection of mutually exclusive clusters.
- e. Cluster comparison

Based on these steps EQ-i and its factor scores of students in the age group of 9 – 14 years were classified as:

1. 65 – 89: low EI
2. 90 – 110: high EI
3. Above 111: very high EI

The intrapersonal EQ scores were classified as:

1. 65 – 89: low intrapersonal ability
2. 90 – 110: high intrapersonal ability
3. 111 - 130: very high intrapersonal ability

The interpersonal EQ scores were classified as:

1. 65 – 89: low interpersonal ability
2. 90 – 110: high interpersonal ability
3. 111 - 125: very high interpersonal ability

The adaptability EQ scores were classified as:

1. 65 – 89: low adaptability
2. 90 – 110: high adaptability
3. 111 - 130: very high adaptability

The stress management EQ scores were classified as:

1. 65 – 89: low stress management
2. 90 – 110: high stress management
3. 111 - 126: very high stress management

The general mood EQ scores were classified as:

1. 65 – 89: low general mood
2. 90 – 110: high general mood
3. 111 - 122: very high general mood

The basic clustering methods (Nargundkar, 2002) used in computer packages are

- a. Hierarchical clustering or Linkage methods
- b. Non - hierarchical clustering or Nodal methods

In this study, there are 4 clusters of students according to the category of EQ-i scores and its factors. Table 5 depicts the number of cases in each cluster and signifies that each cluster is determined by significant number of cases.

Table 5: Number of Cases in each Cluster

	1	227.000
	2	187.000
Cluster	3	196.000
	4	142.000
Valid		752.000
Missing		0.000

Final cluster centers describe the mean value of each variable for each of the 4 clusters. The brief description of each of the 4 clusters as depicted in Table 6 is given below:

Cluster 1

Students belonging to this cluster are 23-year males having high EQ-i score. They have high scores of intrapersonal EQ-i, interpersonal EQ-i, stress management EQ-i, adaptability EQ-i and general mood EQ-i. Their father manages their own business and mother is housewife. Father is a graduate and mother is studied till the 10th standard with family income between Rs. 100,000 and 500,000 per annum.

Cluster 2

Students belonging to this cluster are 23-year-old males with high EQ-i score. They have high scores of intrapersonal EQ-i, interpersonal EQ-i, stress management EQ-i, adaptability EQ-i and general mood EQ-i. Their father is in service with banks, in governmental organizations or private firms as officers, a supervisor and other clerical positions and mother is housewife. Father is a graduate and mother is studied till the 10th standard with family income between Rs. 100,000 and 500,000 per annum

Cluster 3

Students belonging to this cluster are 25-year-old females with low EQ-i score. They have low scores of intrapersonal EQ-i, interpersonal EQ-i, stress management EQ-i, adaptability EQ-i and general mood EQ-i. Their father is working for lowly jobs such as peons, sweepers and watchman and mother is housewife. Both parents are graduates with family income between Rs. 100,000 and 500,000 per annum.

Cluster 4

Students belonging to this cluster are 23-year-old males with low EQ-i score. They have low scores of intrapersonal EQ-i, interpersonal EQ-i, stress management EQ-i, adaptability EQ-i and general mood EQ-i. Their father manages their own business and mother is housewife. Father is a graduate and mother is studied till the 10th standard with family income above Rs. 500,000 per annum.

Table 6: Final Cluster Centers

	Cluster			
	1	2	3	4
Age	23	23	25	23
Gender	1	1	2	1
Category of intrapersonal EQ-i	2.20	2.12	1.64	1.64
Category of interpersonal EQ-i	2.45	2.01	1.31	1.26
Category of stress management EQ-i	2.70	2.25	1.34	1.35
Category of adaptability EQ-i	2.41	2.34	1.42	1.39
Category of general mood EQ-i	2.05	2.6 0	1.24	1.24

Category of Total EQ-i	2	2	1	1
Fathers Occupation	3	2	1	3
Mothers Occupation	1	1	2	1
Father's Literacy level	2	2	2	2
Mother's Literacy level	1	1	2	1
Income	2	2	2	3

FORMULATION OF EI RADAR

There are certain important issues and challenges facing education at college level. In this research, cluster analysis is an exploratory data analysis tool. Cluster helped formulate the radar.

Radar used in seas transportation is a system that uses electromagnetic waves to identify the range, altitude, direction, or speed of both moving and fixed objects such as aircraft, ships, motor vehicles, weather formations, and terrain (Malekar and Mohanty, 2011). In other words, a radar system is used to detect the position and / or movement of objects. It is similar to a map. EI radar displays the position of scores of EI and its factors for 4 clusters which were formed in cluster analysis. This tool presents and relates to all of the factors through which a professional college can look for opportunities to increase EI. We have developed and applied a new framework called the EI radar and it is based on the study conducted till date.

The following are the objectives of EI radar (Malekar and Mohanty, 2011)

- a. Understanding: Broaden and deepen the construct of EI.
- b. Managing: Identify dimensions, which contribute to managing EI.
- c. Improving: Identify best practices to improve EI related to culture, ethnicity of students.
- d. Institutionalizing: Develop framework for enhancing EI of students.

We have identified 4 clusters and the cluster components are age, gender, father's occupation, mother's occupation, father's literacy, mother's literacy and income. Similar to a map, the EI radar consists of five factors that serve as anchors to guide academicians to identify a methodology that would surely increase EI.

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Based on the empirical analysis, various factors affecting EI helped to identify and define the radar's 5 dimensions which were:

1. Intrapersonal EQ-i
2. Interpersonal EQ-i
3. Stress management EQ-i
4. Adaptability EQ-i
5. General mood EQ-i

We have identified 4 clusters and the cluster components are age, gender, father's occupation, mother's occupation, father's literacy, mother's literacy and income. Similar to a map, the EI radar consists of five factors that serve as anchors to guide academicians to identify a methodology that would surely increase EI. EI radars are shown in Fig 11.6 – 11.9 for students (age group 21- 27 years).

Clusters 1 and 2 have high scores of all the five factors - intrapersonal EQ-i, interpersonal EQ-i, adaptability EQ-i and general mood EQ-i resulting in subsequent display in radar 1 and radar 2. (Fig 1 and Fig 2)

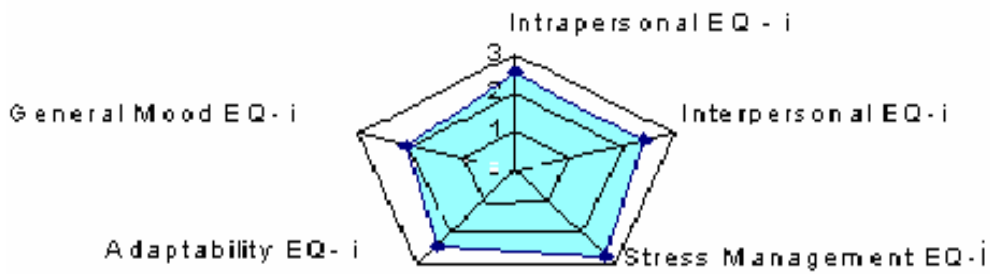


Fig. 2: EI Radar for Students (21 – 27 years) in cluster 1

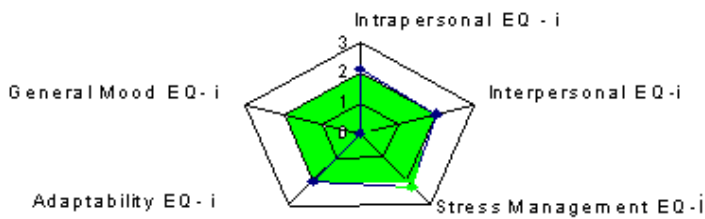


Fig. 3: EI Radar for Students (21 – 27 years) in Cluster 2

Cluster 3 and 4 have low scores of all the five factors - intrapersonal EQ-i, interpersonal EQ-i, adaptability EQ-i and general mood EQ-i resulting in subsequent display in radar 3 and radar 4. (Fig 4 and Fig 5)

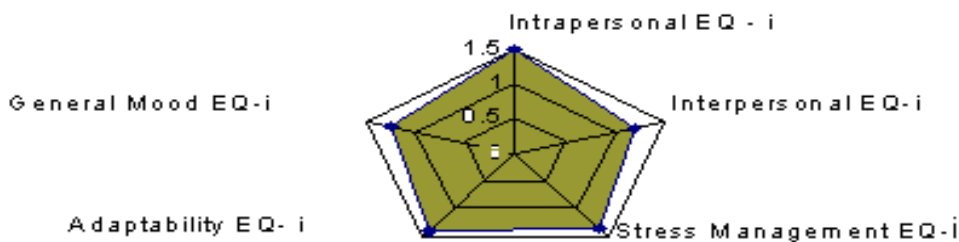


Fig. 4: EI Radar for Students (21 – 27 years) in Cluster 3

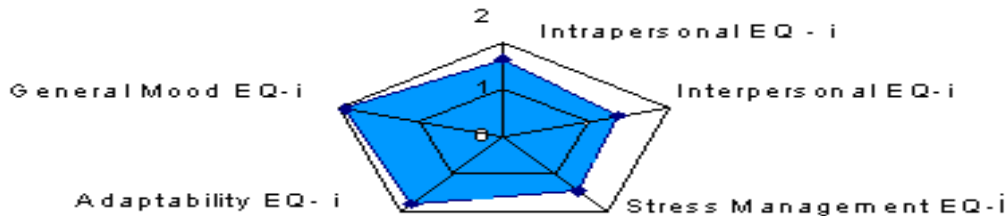


Fig. 5: EI Radar for Students (21 – 27 years) in Cluster 4

- a. To visualize holistically and systematically
- b. To brainstorm and explore the dimensions of EI in a systematic manner
- c. To diagnose and identify students with low scores.
- d. To prescribe and suggest a curriculum for EI development.

CONCLUDING REMARKS

This paper discussed the four stages of evolution of EI. This exploratory study, with a sample size of 752 students aimed at providing a direction to improve their EI scores. Four clusters formed assisted in forming four clusters to provide direction to the students. Education, training, and counseling approaches aimed at developing personal excellence in individuals will provide a widely applicable model for making the world a better place (Malekar and Mohanty, 2011). Even though the primary attention of education is academic performance, there is simply too much convincing evidence that schools and colleges should not and cannot neglect the development of EI skills. Emerging trends necessitate new studies and applied research on the contributions of the emotional mind and the emotional domain of learning. Building healthy and productive students requires the active and intentional development of EI skills and competencies as normal and integral part of the process of education. Thus the final purpose of the research is to create a platform that can practically be used to measure EI and its significant factors and thus provide guidance in the development of youths pursuing career oriented studies to build modern India.

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Appendix I: Chronological Evolution of EI

The chronological evolution of IQ and EQ is seen below:

- * **2,000** years ago - Plato wrote about “all learning’s having an emotional base”.
- * **1677** - Spinazo talked about cognition comprises of emotions and intellect.
- * **1872** – Charles Darwin did the early work on the importance of emotional expression for survival and adaptation.
- * **1904** – A test to measure Intelligence Quotient is developed.
- * **1920** – Thorndike described social Intelligence and its importance for human performance.
- * **1943** – Wechsler observed the impact of non-cognitive and cognitive factors of what he referred as ‘Intelligent behavior’
- * **1954** - Abraham Maslow wrote about the enhancement of emotional, physical, spiritual and mental strengths in people. His work set to life the Human Potential movement and to the development of many new sciences of human capacity in the 1970s and 80s.
- * **1968** - Cattell and Butcher tried to predict both school achievement and creativity from ability, personality, and motivation. The authors succeeded in showing the importance of personality in academic achievement.
- * **1972** - Barton, Dielman and Cattell conducted a study to more fully assess the relative importance of both ability and personality variables in the prediction of academic achievement.
- * **1973** – McClelland launched an entirely new approach to the measure of intelligence proposing a set of specific competencies including empathy, self-discipline and initiative.
- * **1983** - Gardner introduced his theory of Multiple Intelligences, which opened doors to other theories like EI.
- * **1988** - The first of the three major theories to emerge was that of Bar-On. In his doctoral dissertation he coined the term emotional quotient (EQ), as an analogue to intelligence quotient (IQ).
- * **1990** - Salovey and Meyer described that over the last few decades the beliefs about emotions and intelligence have both changed. Intelligence was once perfection, and the people were recognizing that there was more to life. Whereas emotion was once perdition and people were recognizing that it might have substantive value.
- * **1993** – Gardner wrote about ‘Multiple Intelligence’ and proposed that ‘intrapersonal’ and ‘interpersonal’ intelligences are as important as the type of intelligence measured by IQ.
- * **1995** - Emotional intelligence was popularized when psychologist Daniel Goleman wrote his book, Emotional Intelligence: Why It Can Matter More Than IQ.
- * **1998** - Goleman’s 2nd book: Working with Emotional Intelligence, was published and attracted the maximum attention. It brought the concept of Emotional Intelligence to the fore. Goleman’s work was focused on organizations and its application in organizational life brought a different dimension to the management of human capital in organizations.

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- * **2002** – The consortium for research on emotional Intelligence in organizations is formed and has taken the responsibility to carry out quality research on Emotional Intelligence.
 - * **2003** - Singh and Chadha researched on EI and found 3 subscales: emotional competence, emotional maturity and emotional sensitivity.
 - * **2009** - Formation of FEIL (Forum for Emotional Intelligence Learning) is established in India, aimed at development, research and training in EI.