Factors affecting emotional intelligence: an empirical study for some school students in India

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Abstract: Emotional Intelligence (EI) is a subject of research, development and applications in the last few years. Most of the studies are concerned with development of models and measures that can be used in improving managerial performance. It is found from literature that a few studies are available relating to the application of EI among school students. We attempt here to identify critical determinants of EI for school students representing the diversity of India. Such a study will be useful in providing feedbacks about the potentials and limitations of each individual to the parents, teachers and other school authorities. An empirical analysis has been conducted to derive some meaningful conclusions for furtherance of research.

Keywords: management in education; emotional intelligence; intrapersonal ability; interpersonal ability; adaptability; communication; organisational development; leadership; ability models; trait models.


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Professor R.P. Mohanty is engaged in research and academic development work for the last 42 years of his career and has published more than 100 papers in international journals of repute. He has received lifetime achievement award from the Institution of Engineers (India) and several fellowship awards from reputed professional institutions.

1 Introduction

Emotional Intelligence (EI) has emerged as an important field of research during the last several years. Some of the pioneering researchers have defined EI as follows:
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- Goleman (1998) defined EI as the capacity for recognising our own feelings and those of others, for motivating ourselves, and for managing emotions well in us and in our relationships. EI describes abilities distinct from, but complementary to, academic intelligence or the purely cognitive capacities measured by IQ.

- Mayer and Salovey (1997) defined EI as the ability to perceive emotions, to access and generate emotions so as to assist thought, to understand emotions and emotional knowledge, and to reflectively regulate emotions so as to promote emotional and intellectual growth.

- Bar-On (2004) defined EI as a cross-section of interrelated emotional and social competencies that determine how effectively we understand and express ourselves, understand others and relate with them, and cope with daily demands and pressures.

All these pioneering definitions lead us to conclude that EI is important in shaping one’s personality, behaviour, style and abilities. EI has been studied scientifically in the past decade. Business organisations have used EI for organisational development and for enhancing organisation effectiveness (Lowe et al., 1996). EI improves managerial practices as well as helps in leadership development (Druskat and Wolff, 2001). EI is often used to motivate employees and to create a culture of high-performing work place. Huy (1999) introduced the concept of emotional capability to capture an organisation’s ability to acknowledge, recognise, monitor, discriminate and attend to its members’ emotions, and it is manifested in the organisation’s norms and routines related to the feeling.

Further, EI has been used as a predictor of ability by parents as it has been found to be a predictor of life satisfaction, healthy psychological adaptation, positive interactions with peers and family and higher parental warmth (Warwick and Nettelbeck, 2004). EI has also been used in education to lay the foundations to build the culture of a school committed to learning (Parker et al., 2004). The way a child is raised can dramatically affect what happens to the potential in each of these components. For example, if a child is born with a high potential for the arts, but is never given a chance to develop that potential, the world may miss out on this person’s special gift. Children raised in an emotionally abusive home or from a lower economic strata home may use their emotional potential in destructive ways later in their lives.

We have observed from an extensive survey of literature that a lot of studies have been conducted to measure EI and testing its validity with business organisations. We find a very little evidence of EI application for school students. Intelligence testing began in earnest in France, when in 1904 Psychologists Binet and Simon (IQ testing scale) 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 could receive more individual attention. There are studies that demonstrate the link between EI and academic achievement in students making transition from high school to a post-secondary environment (Parker et al., 2004). A finding by Newsome et al. (2000) and Van der Zee et al. (2002) proves that EI is uncorrelated to cognitive ability relating to
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academic performance (cited in Petrides and Furnham, 2004). Another study by Reiff et al. (2001) showed that students with learning disabilities had lower EI scores than their non-disabled counterparts.

We could find that no study is available to demonstrate the important determinants of EI amongst the school students of age group 9–14 years. Therefore, the objectives of this paper are as follows:

- to identify the important factors determining EI of school students and empirically evaluating the strength of each factor
- to develop and test an empirical relationship of EI with the factors driving EI.

2 Review of literature

EI has attracted a lot of interest in academic literature (Petrides and Furnham, 2004). 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. Wechsler (1940) observed the impact of non-cognitive and cognitive factors of what he referred as ‘Intelligent Behaviour’. 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 1980s. Other researchers, such as 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 behaviour. Researchers succeeded in showing the importance of personality in academic achievement. 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. 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:

- intelligence and the internal world of the individual
- intelligence and experience and
- 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. EI as a concept has been included in literature by Salovey and Meyer (1990). Along with Goleman’s 1995 best selling book, there has been a lead article in the same year by Gibbs in TIME magazine. Thereafter, research papers on EI began to appear with increasing frequency with empirical validations on the construct along with scientific theoretical literature. Mayer, Salovey and Caruso (Mayer et al., 2000) categorised models of EI into two types: Ability model (Mayer and Salovey,
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Proponents of mixed models of EI (e.g. Goleman, 1995; Bar-On, 1997; Cooper and Sawaf, 1997; Goleman, 1998) have typically been the most vocal in making claims about the predictive promise of EI and what EI means in terms of life success. These models have generally appeared to assume that just about any variable other than IQ that has been found to show propensity towards predicting some degree of success (e.g. higher income, more frequent promotions, higher academic achievement, higher tertiary attainment, more satisfying interpersonal relationships and better physical and psychological health) is representative of EI. The field of EI, however, is still relatively new and thus many of these claims have not been substantiated. Furthermore, many such claims appear to be unrealistic and to extend beyond what could be reasonably attributed to the EI construct.

On the basis of this research on school students in the western context, EI has been found, among other things, to be positively correlated with relations with others, perceived parental support and fewer negative interactions with close friends (Lopes et al., 2003); pro-social behaviour, parental warmth and positive peer and family relations (Mayer et al., 1999); more optimism (Schutte et al., 1998); higher empathic perspective taking and self-monitoring in social situations, higher social skills (Schutte et al., 2001). Additionally, negative correlations have been reported with illegal drug and alcohol use, defiant behaviour and poor relationships with friends (Brackett and Mayer, 2003), unauthorised absences and exclusions from school (Petrides and Furnham, 2004) and depression (Dawda and Hart, 2000; Schutte et al., 1998).

EI proponents also claim that family socialisation practices determine the development of EI in children (Salovey and Sluter, 1997). Parental socialisation has 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 (cited in Zeidner et al., 2002). Parental socialisations 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 behaviour in everyday life is most likely to implement it as a part of its own behaviour. 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 EI. Mayer and Geher (1996) hypothesised that those who are low in EI could be educated to recognise, express and regulate their feelings better. In this paper, we have tested Bar-On and Parker’s questionnaire of EI in the Indian school students and differentiated the EQ levels of school students (9–14 years) primarily focusing upon to provide a relationship between its factors. We have attempted to identify these factors, which could be implemented for directing students to attain higher EI.
2.1 Factors affecting EI

According to ability models, EI is a form of intelligence involving cognitive processing of emotional information and is defined as a set of cognitive abilities in emotional functioning. Ability models conceptualise intelligence that involves emotion (cited in Goldenberg et al., 2006). Such models define EI in a traditional sense (e.g. Mayer and Salovey, 1997). They are a conceptually related set of mental abilities with emotions and processing of emotional information. Emotional perception and expression, emotional facilitation of thinking, emotional understanding and emotional regulation are the essential elements of the ability model. They contribute to logical thought and intelligence in general. Ability model proposes that emotions can make thinking more intelligent and can intelligently handle emotions. EI has a number of similarities to other types of intelligences and abilities and develop with age and experience. In comparison, mixed trait ability models have EI as partly or wholly a personality-like trait, or behavioural disposition. They define EI as a mixture of emotion-related competencies and personality traits. Mixed trait ability models also make references to abilities in the processing and use of emotional information but combine these abilities with other traits and characteristics such as optimism, motivation and social relationships (Goleman, 1995; Goleman, 1998; Bar-On, 2000; Bar-On, 2001). Mixed trait ability models are important as they acknowledge the importance of multiple aspects of personality that may pertain to emotion. They do not relate to the concept of emotion specifically (Matthews et al., 2003).

Goleman (1995) identified five factors that affect EI. They are: self-awareness, self-regulation, motivation, empathy and social skills. He has also mentioned the influence of communication on all these factors. Similarly, Bar-On (2000) has identified five factors, such as intrapersonal ability, interpersonal ability, stress management, adaptability and general mood. Here we are using factors outlined by Bar-On to find out the relationship of EI with interpersonal ability, intrapersonal ability, stress management, adaptability, general mood and communication excellence tested with Indian school students.

2.1.1 Intrapersonal ability

Shearer (2006) defined intrapersonal ability as an ability to think about and understand one’s self, to be aware of one’s strengths and weaknesses and to plan effectively to achieve personal goals, reflecting on and monitoring one’s thoughts and feelings and regulating them effectively. It is the ability to monitor one’s self in interpersonal relationships, be aware of and understand one’s emotions, feelings and ideas and to act with personal efficacy. It consists of related abilities like recognising and labelling one’s feelings. Intrapersonal ability includes emotional awareness and the ability to identify them correctly. Individuals scoring high on intrapersonal ability tend to understand their emotions and are able to express and communicate their feeling and needs.

2.1.2 Interpersonal ability

It is defined by Shearer (2006) as the ability to recognise the feelings of other people that are facilitated by linguistic skill. It is the ability to be aware of and understand others’ emotions and feelings. Skill in managing relationships with other people is also a factor
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in one’s overall mood and emotional well-being. It consists of related abilities like identifying emotions in others and having empathy towards others. Interpersonal ability deals with the relationship with peers, subordinates and superiors. High on the interpersonal ability are likely to have satisfying interpersonal relationships, are good listeners and are able to understand and appreciate the feelings of others.

2.1.3 Stress management

It is defined as the ability to be flexible and alter one’s feelings with changing situations (Day and Livingstone, 2005). It consists of abilities like delaying or resisting an impulse. Those with high stress management are generally calm and work well under pressure; they are rarely impulsive and can usually respond to a stressful event without an emotional outburst.

2.1.4 Adaptability

Day and Livingstone (2005) defined adaptability as the ability to be flexible and alter one’s feelings with changing situations. It consists of abilities like being to adjust one’s emotions and behaviour to changing situations or conditions. Adaptability involves skills related to management of change. Managing change involves the ability to manage stressful situations in a relatively calm and proactive manner. Individuals who score high on this dimension are impulsive rarely and work well under pressure (Bar-On, 1997; Bar-On, 2000; Bar-On, 2002). Individuals with high adaptability scores are flexible, realistic and effective in managing change; good at finding positive ways of dealing with everyday problems.

2.1.5 General mood

It is defined as the ability to feel and express positive emotions and remain optimistic (Bar-On, 1997). It represents the ability to enjoy life and maintain a positive disposition. Higher levels on general mood feel satisfied with their lives and maintain a positive outlook. Happiness and optimism are two aspects of general mood including maintenance of positive aspects and brighter side of life.

2.1.6 Communication excellence

Goleman (1995) emphasised that communication is imbibed in EI. Communication can mean different things and used in different ways. Communication is the social process by which people in a specific situation construct meaning using symbolic behaviour (Rozakis, 1995). Emphasising the various processes of communication, Louis (2006) defines communication as the sum of all the things one person does when he wants to create understanding in the mind of another; it involves a systematic and continuous process of telling, listening and understanding. Communication excellence examines the knowledge of students with respect to excelling, reasoning in communication (communication excellence I – CE I) and the level of responsibility and sensitivity in communicating (communication excellence II – CE II).
2.2 Measures of EI

A number of assessment devices purporting to measure EI have been developed. The devices differ in two significant ways:

1. they are based on different conceptual frameworks
2. they use different measurement approaches including performance tests, self-report inventories or observer ratings.

Thus there has been a lot of debate concerning the most suitable method to be used for measuring EI. Some have argued that measurement approach rather than the theoretical approach ultimately determines the nature of EI model being assessed (Petrides and Furnham, 2000; Matthews et al., 2003). It is argued that performance measures are more valid if EI is a type of ability, whereas self-report instruments can be used if EI is viewed of comprising a number of non-ability related traits or attributes (Goldenberg et al., 2006).

Thus the measures of EI similar to ability and mixed trait ability models are classified as performance-based measures of EI and self-report measures of EI.

1. performance-based measures of EI pertain to ability models for instance Mayer, Salovey, Caruso Emotional Intelligence Test (MSCEIT YV) by Mayer, Salovey and Caruso (Mayer et al., 2005), which is yet in the sampling stage.

2. self-report measures are pertaining to mixed models of EI. They are determined to assess emotions within the personality framework and to assess cross-situational consistencies in behaviour (Petrides and Furnham, 2000) for instance Emotional quotient inventory: Youth Version (EQ-i:YV) by Bar-On and Parker (2000)

In this paper, we have tested Bar-On and Parker’s questionnaire of EI in the Indian school students of different ethnic groups and differentiated the EQ levels of school students (9–14 years) primarily focusing upon to provide a relationship between its factors.

3 Research design process

Research design is a very important step to outline the plan and structure of issues to be investigated. It is the depiction of a framework or organisation or configuration of the relationships among variables involved in the study and the systematic investigations to obtain empirical evidences. Figure 1 is a representation of the research process that we have undertaken in this study.

3.1 Research design

Kothari (1999) defined research design as the arrangement of conditions for collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. A research design must contain the clear statement of the research problem, procedures and techniques for gathering information, the population to be studied and the methods used in processing and analysing data.
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Figure 1  Research design process

3.1.1 Type

We have adopted a diagnostic type of research design. Diagnostic research aims at obtaining complete and accurate information with enough provision for protection against bias and prejudices and even a-priori perceptions, which helps in improving data reliability. The diagnostic research design enables to find appropriate method to be applicable to the target sample. It is a cross-sectional, field-setting study. Cross-sectional studies are carried out once and represent a snapshot at one point in time. Our research has been conducted in real-life situations hence it is field-setting statistical study. Statistical studies are designed for breadth rather than depth. They capture population’s characteristics by making inferences from a sample’s characteristics. The statistical analysis designed in the study involves the use of correlation coefficients determination followed by multiple regression analysis. It helps in assessing the individual and the combined effect of independent variables (factors) on the dependent variable (EQ).

3.1.2 Purpose

Research design facilitates efficiency in research operations thereby yielding maximal information with minimal expenditure of effort, time and money. Research design stands for advance planning of the methods to be adopted for collecting data and techniques to be used in technical analysis. The researcher has to keep in mind the objective of research and the availability of staff, time and money. The research design helps the researcher to organise their ideas in a form whereby looking into flaws and inadequacies is possible.
3.2 Selection of questionnaire

Questionnaires are an efficient data collection mechanism when the researcher knows exactly what is required and how to measure the variables of interest (Sekaran, 2007).

3.2.1 Rationale

Biases in research can be minimised if a questionnaire focuses on three areas: the wording of questions, general appearance of questionnaire and planning of issues of how the variables will be categorised, scaled and coded after receipt of the responses interest (Sekaran, 2007). It is important to conduct a thorough measurement analysis on survey instrument, which is used for research. Measurement analysis provides the audience with assurance that the findings reflect accurate measures and the results are believable. In the following paragraphs, we explain the compilation of questionnaires.

We intend to use self-report measures pertaining to mixed models of EI for our present study and the description of the factors as per Bar-On (2000) and Parker (2002) affecting EI that are discussed hereafter.

In this study, we administered a communication quiz developed by Rozakis (1995) examining the students for their responsibility levels in communicating along with Bar-On EQ-i:YV (Bar-On and Parker, 2000) measuring the EI of students. Both the questionnaires were combined and modified with an additional questionnaire testing the listening skills of students. The entire test was conducted with these three questionnaires clubbed together.

The EQ-i:YV is a 60 item self-report measure of EI developed by Bar-On and Parker (2000). Children and adolescents between the ages of 9 and 14 are asked to respond to the statements which best describe the way they feel, think or act in most situations. Responses are rated by the participant on four-point Likert scales, ranging from 1 for ‘very seldom or not true of me’, to 4 for ‘very often true or true of me’. The instrument has a 6-item intrapersonal scale, a 12-item interpersonal scale, a 12-item stress management scale and a 10-item adaptability scale. Along with a total EI scale (the sum of the four previous scales), the EQ-i:YV also has a 14-item general mood scale and a 6-item positive impression validity scale. A high score on any individual ability (or the total score) reflects a high level of social and emotional competency. Bar-On and Parker (2000) report that the EQ-i:YV has a replicable factor structure (developed with a normative sample of 9172 school-aged children and adolescents); the various scales on the instrument correlate highly with comparable scales on the adult version of the inventory (the Emotional Quotient Inventory; Bar-On, 1997).

3.2.2 Relevance

To be successful, questionnaire should be short and simple (Kothari, 1999). Questions should proceed in a logical sequence moving from easy to more difficult ones. Technical terms and expression with numerous interpretations should be avoided. Reliable and valid instrument provides practitioners with a tool for self-assessment and continuous improvement. All psychological testing questionnaires must be reliable and valid hence a widely used measure of EI was selected for this study: Bar-On and Parker’s EQ-i:YV (for the age group of 9–14 years).
3.2.3 Pre-testing

Pre-testing was carried out in two stages. In the first stage, a draft of the questionnaire was provided to two academicians and they were requested to critically evaluate the items from the standpoint of item specificity and clarity of construction. Based on critique received, some items were revised to improve their specificity and clarity.

The second pre-test involved administering the questionnaire to students. They were asked to complete the questionnaire and indicate any ambiguity or other difficulty they experienced in responding to the items, as well as to offer any suggestions they deemed appropriate. The pre-testing was done with the ten students each of a school. After second pre-test, the questionnaire was reviewed based on expert’s comments and phrasings of some items were modified to make the final research instrument more effective. A pre-test for students in the age group of 9–14 years indicated a questionnaire completion time of 40–45 minutes as there were 3 questionnaires.

3.3 Sampling design

3.3.1 Sampling frame

A sampling frame is closely related to the population. It is a list of elements from which the sample is actually drawn (Cooper and Schindler, 2007). The selection of samples for this survey has been made on the basis of following criteria:

1. participant should be in the age group of 9–14 years
2. school authorities give permission to administer the questionnaires in their premises.

3.3.2 Sampling method

The type of sampling method selected for this research is purposive quota sampling. Purposive sampling includes obtaining necessary group from specific target groups. The sampling is confined to certain types of people for two reasons:

1. they conform to some criteria set by the researcher (Quota Sampling)
2. some specific people have the information (Judgment Sampling).

Based on the above-mentioned reasons, quota sampling was the technique used in this research. Quota sampling (Sekaran, 2007) ensures that certain groups are adequately represented in this study through the assignment of a quota. A quota is fixed for each sub-group based on the total number of each group in the population. Quota samples are stratified groups from which subjects are selected non-randomly (Sekaran, 2007).

We have selected the schools based on State Board of Secondary and Higher Secondary Examination pattern [Secondary School Certificate Examination (SSC)] and Indian central board schools [Indian School Certificate Examination (ICSE) and Central Board of Secondary Education (CBSE)].

Tribal schools, residential schools and schools adhering to four types of trusts, viz Christian, Jewish, Islam and Hindu, were also selected. Data of students in schools of some rural areas and some important towns were also considered. Basically schools of different ethnic groups are considered. All these schools adhere to the syllabus of Secondary School certificate examination.
Table 1 portrays the gender-based profile of students based on Chi square results. It shows that the sample is not uniformly distributed for Standard 5th and 7th for the schools, as significance level is 0.009 and 0.20 indicating variation. For 6th, 8th and 9th class there is no significance (0.215, 0.567 and 0.131) and the sample is uniformly distributed in the classes.

Table 1  
Tabulated data of number of students in various types of schools

<table>
<thead>
<tr>
<th>Gender</th>
<th>ICSE students</th>
<th>CBSE students</th>
<th>SSC students</th>
<th>Tribal school students</th>
<th>Rural school students</th>
<th>Residential Schools students</th>
<th>Urban City school students</th>
<th>Students in four schools based on religious trusts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>190</td>
<td>315</td>
<td>483</td>
<td>439</td>
<td>195</td>
<td>275</td>
<td>210</td>
<td>616</td>
</tr>
<tr>
<td>Female</td>
<td>41</td>
<td>141</td>
<td>562</td>
<td>104</td>
<td>72</td>
<td>244</td>
<td>332</td>
<td></td>
</tr>
<tr>
<td>Grand Total</td>
<td>231</td>
<td>456</td>
<td>1045</td>
<td>543</td>
<td>365</td>
<td>347</td>
<td>454</td>
<td>948</td>
</tr>
</tbody>
</table>

3.4 Collection of data

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. Data were collected from questionnaires administered from February to September 2006. A workshop for students along with personal interviews for teachers and the principal were two additional activities that were conducted. Additional data to check the predictive power of the regression equation was collected in January to July 2008.

3.4.1 Workshop for students

A workshop is an educational seminar or series of meetings emphasising interaction and exchange of information among a usually small number of participants Agreement of the principal led the researcher to conduct the test in their premises and a workshop was conducted for students to explain the contents of the questionnaire. The listening skills of the individuals were observed.

3.4.2 Administration of questionnaire

Participants were asked if they would volunteer to study on ‘emotional intelligence and communication excellence’. Participants completed the Bar-On Emotional quotient inventory: Youth Version (Bar-On and Parker, 2000) during a zero period and along with the communication questionnaires comprising of 10 questions each in the premises of their school. In exchange for their participation, individuals were provided with a confidential feedback report on their results on each of the instruments.

3.4.3 Personal interviews

Personal interview method requires a person known as the interviewer asking questions generally in a face-to-face contact to the other person or persons (Kothari, 1999). This sort of interview may be in the form of direct personal investigation or indirect oral investigation. In the case of direct personal investigations, the interviewer has to collect the information personally from the sources concerned. He has to be on the spot and meet...
people from whom data has to be collected and is suitable for intensive investigations. Direct personal investigations were conducted with teachers and the principals regarding the attitude and behaviour of their students of their respective classes. Specific comments made by the teacher were noted.

3.5 Analysis of data

3.5.1 Computation of scores

We computed the scores with the aid of SPSS® 11.5 for MS Windows® statistical package and Microsoft Excel worksheets.

CE had scores out of 10 for each of the questionnaire calculated with the methodology developed by Rozakis (1995) and EI scores had to be calculated by the methodology developed by Bar-On and Parker (2002) for his youth version of the test.

3.5.2 Descriptive statistics

The sample size consisted of a total number of 4662 students in 25 schools of India. 283 students who did not complete the main battery of measures could not be considered hence the main sample size reduced to 4379 students – all of them belonging to age groups 9–14 years. 2713 (61.95%) of respondents were male and 1666 (38.05%) female. Table 2 presents the descriptive statistics of the individuals with its EI and its factors scoring sheet scores. It also denotes descriptive statistics of EQ along with its factors: 65 as lowest score and 130 as maximum. Communication questionnaires had scores out of 10.

Students ranged from 9 to 14 years of age; the mean age was 12.34 years (SD 1.55) for males and 12.57 years (SD 1.63) for females.

Table 2 Statistics for school students

|                  | Minimum |          | Maximum |          | Mean |          | SD
|------------------|---------|----------|---------|----------|------|----------|---
|                  | Male    | Female   | Male    | Female   | Male | Female   |   |
| AGE              | 9       | 9        | 14      | 14       | 12.34| 12.57    | 1.550 1.630 |
| EQ               | 65      | 65       | 130     | 130      | 91.18| 90.9     | 14.968 13.95 |
| CE I (scores out of 10) | 0 | 0 | 10 | 10 | 4.09 | 5.06 | 1.877 1.077 |
| CE II (scores out of 10) | 0 | 0 | 10 | 10 | 6.19 | 7.34 | 2.432 2.54 |
| General mood     | 65      | 65       | 122     | 122      | 87.92| 88.54    | 15.094 15.876 |
| Adaptability     | 65      | 65       | 130     | 130      | 95.22| 97.73    | 16.434 16.783 |
| Stress Management| 65      | 65       | 126     | 126      | 88.31| 87.55    | 13.474 12.543 |
| Interpersonal ability | 65 | 65 | 125 | 125 | 90.06 | 90.88 | 16.949 17.989 |
| Intrapersonal ability | 65 | 65 | 130 | 130 | 97.85 | 96.32 | 14.425 14.025 |

3.5.3 Reliability assessment

The concept of reliability has been used to cover several aspects of score consistency. Test reliability indicates the extent to which individual differences in test scores are attributable to ‘true’ differences in the characteristics under consideration and the extent to which they are attributable to chance errors. These errors cannot be avoided or corrected through improved methodology.
A youth version (EQ-i:YV) (Bar-On and Parker, 2000) for children from 6 to 12 years of age and for adolescents from 13 to 17 years of age was normed with a sample of 9172 students from the USA and the Canada (Bar-On and Parker 2002).

In this study, reliability for EQ-i:YV and CE I and CE II in the form of Cronbach Alpha was found to be 0.69 to 0.86 for the 7 factors and an overall average internal consistency of 0.78. The values of Cronbach alpha for all the factors of EI are presented in the Table 3. The differences in the Cronbach alpha values may be due to the cultural differences as Bar-On and Parker’s (2002) study had samples from the USA and the Canada and this study is in the Indian context.

<table>
<thead>
<tr>
<th>Factors of EI</th>
<th>Cronbach Alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrapersonal EQ-i</td>
<td>0.86</td>
</tr>
<tr>
<td>Interpersonal EQ-i</td>
<td>0.81</td>
</tr>
<tr>
<td>Adaptability EQ-i</td>
<td>0.82</td>
</tr>
<tr>
<td>Stress management EQ-i</td>
<td>0.83</td>
</tr>
<tr>
<td>General mood EQ-i</td>
<td>0.80</td>
</tr>
<tr>
<td>CE I</td>
<td>0.69</td>
</tr>
<tr>
<td>CE II</td>
<td>0.75</td>
</tr>
</tbody>
</table>

3.5.4 Assessment of degree of association of factors

This assessment determines the relationship between variables and is determined by correlation coefficient. The objective is to ascertain whether there is an association with two or more variables and if yes then to what degree (Cooper and Schindler, 2007). Correlation coefficient (Anastasi and Urbina, 2005) expresses the degree of relationship between two sets of scores. This coefficient assumes the following (Kothari, 1999):

1  there is a linear relationship between the two variables
2  one of the variable is independent and the other one is dependent – means they are casually related
3  a large number of independent causes are operating which produces a normal distribution.

In order to test the association of EI and its factors, a detailed set of statistical analysis was conducted first being a confirmatory Pearson’s Correlation as seen in Table 4.

There is a range of correlation coefficients between the factors as described below:

- Adaptability realm has highest correlation with EI followed by interpersonal ability compared to the study conducted by Parker et al. (2004) where \( r = 0.709 \) for adaptability and \( r = 0.648 \) for interpersonal ability. In that study the former correlates highest with EI.
- Intrapersonal ability correlates moderately with EI and the extent to which stress management and general mood correlate is nearly the same similar to the study conducted by Parker et al. (2004).
Factors affecting emotional intelligence

- There is significant correlation between the communication excellence II and EI along with some of its subscales. At 0.01 level CE II correlates with interpersonal ability and adaptability.

**Table 4  Correlations of EI and its factors**

<table>
<thead>
<tr>
<th>Factors</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.602(**)</td>
<td>0.648(**)</td>
<td>0.542(**)</td>
<td>0.709(**)</td>
<td>0.535(**)</td>
<td>0.012</td>
<td>0.031*</td>
</tr>
<tr>
<td>2</td>
<td>0.164(**)</td>
<td>0.327(**)</td>
<td>0.229(**)</td>
<td>0.220(**)</td>
<td>0.012</td>
<td>-0.012</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>0.125(**)</td>
<td>0.577(**)</td>
<td>0.629(**)</td>
<td>0.012</td>
<td>0.041(**)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>0.199(**)</td>
<td>0.104(**)</td>
<td>0.000</td>
<td>0.008</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>0.528(**)</td>
<td>0.011</td>
<td>0.049</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>-0.001</td>
<td>0.011</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>0.408(**)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level (2-tailed).**
*Correlation is significant at the 0.05 level (2-tailed).

1 = EI  
2 = Intrapersonal ability  
3 = Interpersonal ability  
4 = Stress management  
5 = Adaptability  
6 = General mood  
7 = CE I  
8 = CE II

3.5.5 Tests of regression

Regression (Kothari, 1999) is the determination of a statistical relationship between two or more variables. These tests are adopted when there is one dependent variable, which is presumed to be a function of two or more independent variables. Regression can interpret what exists physically and there must be a physical way in which independent variables affect dependent ones. The objective of this analysis is to make a prediction about the dependent variable based on its covariance with the independent variables.

As the objective of this paper is to identify and assess the effect of factors on EI, the method of multiple regression analysis has been chosen, as it helps in assessing the individual and the combined effect of independent variables (interpersonal, intrapersonal, adaptability, stress management, general mood, communication excellence I and communication excellence II) on the dependent variable (EI). A Levene’s test of heteroscedasticity (Koutsoyiannis, 1977) was conducted to test the homogeneity of the sample. The results showed no difference in sample variances and hence the entire sample was found to be homogenous ($p = 0.01$).

The steps used in conducting the regression analysis on the above sample are as follows:

Firstly, school-wise analysis with seven factors (as explanatory variables) of EI was done. The regression equation for school-wise analysis with seven factors is as follows:

$$Y = A + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + B_6X_6 + B_7X_7, \ldots$$  \hspace{1cm} (1)

Y = dependent variable representing EI

$B_1$, $B_2$, $B_3$, $B_4$, $B_5$, $B_6$, and $B_7$ are the coefficients of the regression equation

$X_1$ = intrapersonal ability, $X_2$ = interpersonal ability, $X_3$ = stress management,
$X_4$ = adaptability, $X_5$ = general mood, $X_6$ = CE I, $X_7$ = CE II, $A$ = constant term.
The regression was then tested for its significance using F-test for the regression as a whole (for example to test whether the EI is dependent on the intrapersonal ability, interpersonal ability, stress management, adaptability, general mood, communication excellence I and communication excellence II at 5% level of significance. This was followed by t-test to test the significance of each of the drivers at 5% level of significance. The F-test results showed that the regression as a whole was significant for the first 4 factors. Hence, in order to improve and get more significant results, it was essential to omit the factors that were not significant. From the t-ratios in the above regressions, it could be seen that general mood, CE I and CE II were not significant factors of EI. Further the overall impact of general mood and communication excellence I and II can be overcome by using and calculating EI as a function of the intrapersonal ability, interpersonal ability, stress management and adaptability by omitting general mood and CE I and CE II. So, regression analysis with three factors (as explanatory variables) of EI was carried out with the following equation:

$$Y = A + B_1X_1 + B_2X_2 + B_3X_3 + B_4X_4$$

(2)

Table 5 denotes the descriptive statistics with regression analysis for four factors of EI. The following points are worth mentioning:

- the results were found to be significant in the data of 4379 students
- four explanatory variables – intrapersonal ability, interpersonal ability, stress management and adaptability are significant factors affecting EQ. General Mood, CE I and CE II do not seem to impact EI
- general mood along with CE I and CE II are not significantly affecting EQ and hence cannot be considered as a factor.

### Table 5  Regression analysis for 4 factors of EI

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Unstandardised coefficients</th>
<th>Standardised coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>F</th>
<th>R Square</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>−33.146</td>
<td>.926</td>
<td>−35.81</td>
<td>.000</td>
<td>3080.37</td>
<td>0.832</td>
</tr>
<tr>
<td>Intrapersonal ability</td>
<td>.369</td>
<td>.007</td>
<td>.343</td>
<td>49.971</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Interpersonal ability</td>
<td>.286</td>
<td>.008</td>
<td>.318</td>
<td>36.567</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Stress management</td>
<td>.317</td>
<td>.008</td>
<td>.278</td>
<td>41.332</td>
<td>.000</td>
<td></td>
</tr>
<tr>
<td>Adaptability</td>
<td>.331</td>
<td>.008</td>
<td>.356</td>
<td>43.826</td>
<td>.000</td>
<td></td>
</tr>
</tbody>
</table>

Note: Dependent variable: EI

### 3.6 Analysis of results and interpretation

#### 3.6.1 Comparison of results with the findings of other researchers

Our results of correlation analysis do confirm with Parker et al. (2004) analysis. However, our ranking of degree of association is different. The findings are shown in Table 6 and the following observations are worth mentioning:
Factors affecting emotional intelligence

- In our study, adaptability was found to be highly significant with EI, symbolising higher level of ability to make transitions from one state of mind to the other without displaying rigidity/resistance to change. Indian students are able to adjust one’s emotions and behaviours to changing conditions, which may be attributed to Indian culture.

- Secondly, correlation coefficient of interpersonal ability with EI was found to be 0.648, which shows that the individual could understand peers and elders, displaying a considerable degree of maturity. In comparison, Parker et al. (2004) revealed highest association with EI, which implied that the students were able to comprehend interpersonal ability better than Indian students.

- Intrapersonal ability was found to be moderately significant with EI \((r = 0.602)\). Intrapersonal ability refers to understanding one’s self and being aware of one’s strengths and weaknesses and Indian students were found to possess higher levels of this skill.

- In our study, stress management was found to be moderately significant with EI \((r = 0.542)\), which implied that Indian students are able to cope with stressful situations with ease. They were also able to delay or resist an impulse.

- There are no considerable differences in the general mood of students irrespective of their country of origin.

- CE II has the least degree of correlation coefficient with EI. The study signifies that students (9–14 years) are related minutely to their ability to communicate with a degree of responsibility and sensitivity.

- There is no correlation of significance between CE I and EI denoting that at a young tender age of 9–14 years their emotional mind is still developing. There possibly could be stability in their level of communication at a later stage. The knowledge of students with respect to excelling, reasoning in communication has no association with EI. The influencing elements are probably more intrinsic and intangible.

Table 6 Comparative order of association of factors

<table>
<thead>
<tr>
<th>Order of Association</th>
<th>Our findings</th>
<th>Parker et al. study (2004b)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Adaptability (r = 0.709)</td>
<td>Interpersonal (r = 0.80)</td>
</tr>
<tr>
<td>2</td>
<td>Interpersonal ability (r = 0.648)</td>
<td>Stress management (r = 0.75)</td>
</tr>
<tr>
<td>3</td>
<td>Intrapersonal ability (r = 0.6012)</td>
<td>Adaptability (r = 0.74)</td>
</tr>
<tr>
<td>4</td>
<td>Stress Management (r = 0.542)</td>
<td>Intrapersonal (r = 0.702)</td>
</tr>
</tbody>
</table>

Note: \(r\) = coefficient of correlation.

3.6.2 Testing of significance of the difference between a single prediction and actual observation

The tests of significance between single prediction and the actual observation are this test of testing the predictive power of the equation (Koutsoyiannis, 1977). This test is frequently used as the basis for evaluation of the forecasting power of the model. In this test observed ‘T’ is compared with its theoretical value and decide whether the observed difference is significant.
Sample for testing the predictive power of the equation was collected in June/July 2008. In our test, actual value of ‘T’ is less than the predicted value. The observation is compatible with the estimated relationship. In this case, we accept that the predictive power of our equation is good. Table 7 presents values of T – actual and predicted. In our test the difference between the actual and forecasted value may be due to abnormal conditions in the period of forecast (Koutsoyiannis, 1977). In this case, our equation is still valid and we do not need to modify it.

Table 7  Values of T actual and T predicted for four significant factors of EI

<table>
<thead>
<tr>
<th>Model</th>
<th>Factors</th>
<th>T (actual)</th>
<th>T (predicted)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Adaptability</td>
<td>74.988</td>
<td>73.88</td>
</tr>
<tr>
<td>2</td>
<td>Adaptability</td>
<td>76.959</td>
<td>72.1</td>
</tr>
<tr>
<td>3</td>
<td>Intrapersonal ability</td>
<td>58.082</td>
<td>58.02</td>
</tr>
<tr>
<td>4</td>
<td>Adaptability</td>
<td>49.377</td>
<td>49.21</td>
</tr>
<tr>
<td></td>
<td>Intrapersonal ability</td>
<td>64.717</td>
<td>62.5</td>
</tr>
<tr>
<td>5</td>
<td>Interpersonal ability</td>
<td>42.251</td>
<td>41.11</td>
</tr>
<tr>
<td>6</td>
<td>Stress management</td>
<td>46.362</td>
<td>46.21</td>
</tr>
</tbody>
</table>

Note: Dependent variable: EI.

1 Model 1 Predictors: adaptability
2 Model 2 Predictors: adaptability, intrapersonal ability
3 Model 3 Predictors: adaptability, intrapersonal ability, interpersonal ability.
4 Model Predictors: adaptability, intrapersonal ability, interpersonal ability, stress management.

4 Conclusions

In this paper, the factors affecting EI are studied by making a thorough review of literature and have identified some factors by a pilot survey to understand the construct and its applicability in case of students (age group 9–14 years). These factors have been statistically tested for their significance. The sample size is restricted to 4379 students, which represents diverse conditions including age, gender, parental occupation and literacy and family income. Correlation and regression analyses were performed in order to assess the association and the strength of association of each of the factors. The predictive power of the regression equation is examined.

The following remarks are worth noting:

- Results of the present study suggest that adaptability; interpersonal ability and intrapersonal ability are important factors affecting EI. Adaptability was found to be very highly significant with EI with correlation coefficient of 0.709. Interpersonal ability was found to be highly significant with EI with correlation coefficient of 0.648. Intrapersonal ability was found to be moderately significant with EI with correlation coefficient of 0.602.
• General mood and stress management were found to be moderately significant with EI with correlation coefficient of 0.535 and 0.542, respectively.

• CE II has the least degree of correlation coefficient. It signifies that in the Indian context for students of 9–14 years the emotional aspect of children is related to the level of responsibility and sensitivity in communicating (CE II). No significant correlation existed between CE I and EI. It may be interpreted that at an age of 9–14 years, the emotional mind is under the process of development and would mature subsequently as the students grow in age and leading to improvement in communication skills.

• The influencing elements of CE I may be more intrinsic and probably have to be related to the quality of parenting, cultural parameters of the society in which they reside and the academic environment of the schools in which they study.

This study has the following limitations:

• Many claims that EI is a better predictor of life success, like academic performance and leadership, than IQ or personality traits are derived from popular science writing and are not well supported by empirical research. Study is to be conducted on students on the above-mentioned aspects.

• EI is claimed to contribute to 67% of life success. IQ claims to contribute to 20% of life success. This study does not combine measures of IQ and EQ to predict life success of an individual.

• There is relatively a very little evidence that EI traits or competencies can be learned, or by teaching EI will improve other areas of functioning. Research suggests that currently used measures of EI are culturally biased, given that it is difficult to understand the results of an EI measure outside of its western cultural context. On a multicultural organisational context, this might pose difficulties. Use of EI measures as recruitment criteria or for other evaluative/predictive purposes will be appropriate with measures, which are not biased culturally and demonstrate predictive validity.

The analysis presented here may guide to a considerable extent in shaping the EI of students at a young age. However, such a study has not considered the value system of parents and the EI scores of parents. The debate still remains – is there an association between the EI of parents and their children? Certainly, additional studies are needed to examine the validity of EI models in various settings. There are problems with the current conceptualisation of EI. Even though there are theoretical and statistical arguments suggesting that trait and ability EI should be seen as two separate constructs, this argument is likely to continue, given recent evidence that trait and ability EI predict similar life successes. Studies are needed to examine the validity of ability and trait EI models in various settings.

Acknowledgements

The authors wish to acknowledge with gratitude the comments and suggestions made by anonymous reviewers to make the paper more meaningful.
References
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