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Academic Performance: Mapping Traits of Engineering Students

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Abstract
The purpose of the study is to assess the traits of engineering students in relation to their performance and adjustment. Participants were 272 engineering students. The tools used are Myers Briggs Type Indicator (MBTI) and student problem checklist to assess the personality traits and adjustment level of the students. The statistical procedures employed were t test. The analyses of the data signify that the students with personality traits such as Thinking and Sensing types show better performance and adjustment than the students with personality such as Feeling and Intuitive types. The study indicates that if students learning styles matches to their chosen academic course, they tend to show better performance and less adjustment problems though the mental abilities is same for both.
Keywords: academic performance, adjustment, personality trait.

1. Introduction

Understanding the reasons for individual differences in levels of scholastic achievement has always been a concern of educational psychologists. Knowledge of the factors that influence academic success has important implications for understanding better, the process of learning and academic achievement and adjustment. Many educators are keener on understanding the process of valid prediction of who will perform well, and who will perform poorly, in academic results.

Research has acknowledged that cognitive ability is one important determinant of academic achievement (e.g., Ackerman & Heggestad, 1997). However the researchers also believe that ability factors alone are not sufficient to account fully for individual differences in academic success (Chamorro-Premuzic & Furnham, 2006). Thus, researchers have sought to identify non-cognitive predictors of academic performance, including variables related to personality dispositions, learning styles etc.

Research has found that the relation between cognitive ability and academic success is often weaker than expected in samples of university students, in comparison to samples of elementary and secondary school students. One explanation for this loss in predictive power is restriction of range in the intelligence scores of students enrolled in post-secondary programs (Furnham Chamorro-Premuzic, , & McDougall, 2003). Another reason (Ackerman , Bowen, Beier, & Kanfer, .et al., 2001) is that the criterion of academic achievement tends to shift over time, from factors that favor cognitive abilities (e.g., critical thinking) to factors that favor personality or motivational variables (e.g., domain knowledge). In addition, universities seem to be placing a greater emphasis on continuous assessment methods (e.g., attendance, class participation), and personality traits might be especially relevant for predicting such criteria. Taking into consideration, the three broad justifications outlined above provides the researchers a strong impetus for the examination of personality variables as predictors of academic performance.

Following theoretically from Cronbach's (1954), there has been an increasing awareness that assessing intelligence as maximal performance likely misses aspects of typical performance that influence academic achievement. Indeed, it has been point out that "abilities are only one part of the complex causal framework that determines whether a student pursues the acquisition of knowledge and skills within a particular domain" (p. 176). In addition to ability, determinants of typical performance such as personality, motivation, or interest may have direct, indirect, or interacting effects on academic achievement.

Although the direct relationship between school success and personality traits has also been studied extensively (Chamorro-Premuzic & Furnham, 2005; De Raad & Schouwenburg, 1996), the results are not as straightforward as they are for the relationship between intelligence and academic achievement. Farsides and Woodfield (2003) concluded that empirical evidence is mixed concerning the role the personality traits plays in determining academic success. They proposed several reasons for this discrepancy, among which are age specificity of the relationship (e.g., Neuroticism is positively related to academic achievement in middle school but negatively at college age; similar to Extraversion, De Raad & Schouwenburg, 1996; Eysenck, 1996), however even the small sample sizes, varying time lapses between the collection of predictor and criterion data, and the use of different personality measures and different criteria plays a role in determining academic success.

While a lot of research has been conducted with college students, few studies have related personality to academic achievement in adolescents and younger children. Barbaranelli, Caprara,Rabasca, and Pastorelli (2003) reported a negative correlation between academic achievement as measured by grade point average (GPA) and self-reported Energy as measured by the Big Five Questionnaire for Children, as well as positive correlations between GPA and Intellect/Openness and Conscientiousness in Elementary School and Junior High School children. Hair and Graziano (2003) analysed the correlations between high school GPA and Big Five traits assessed by bipolar adjective scales when the participants were in middle school. A significant positive correlation was found for all personality factors except Emotional Stability, which was insignificantly correlated to GPA. Heaven, Mak, Barry, and Ciarrochi (2002) examined how personality variables measured by the Junior Eysenck Personality Questionnaire (JEPQ) and adjective scales for Agreeableness and Conscientiousness were related to self-rated academic performance in adolescents of 14–16 years of age. They found a negative correlation with Psychoticism and positive correlations with Agreeableness and Conscientiousness. Another study (Maqsud, 1993) using the JEPQ in 14–15 year olds reported a negative relationship between psychotics and academic achievement in languages, but achievement was also found to be significantly negatively correlated with Extraversion and Neuroticism. In an additional study, none of the three factors of Eysenck's personality model correlated significantly with GPA in a sample of Russian adolescents (Slobodskaya, Safronova, & Windle, 2005). On the other hand (Aluja-Fabregat & Blanch, 2004) assessing personality with Cattell's High School Personality Questionnaire in adolescents with a mean age of 13.4 years, academic achievement was positively related to Intelligence, Emotional Stability, Conformity and Self-Discipline, and negatively related to Impulsivity. These examples clearly illustrate the diversity of methods which results in previous research. One group of predictor variables that has generated a considerable amount of interest is the Myer Briggs Type Indicator (MBTI) dimensions.

Similarly the studies of personality type effects in engineering education have been carried out by a consortium of eight universities and the Center for Applications of Psychological Type (McCaulley, 1983,1985) and by Rosati (1993, 1997). In all of these studies, introverts, intuitors, thinkers, and judgers generally outperformed their extraverted, sensing, feeling, and perceiving counterparts. Wankat and Oreovicz (1993) observe that if memorization and recall are important, sensing types should perform better, while if analysis is required, intuitive students should have an advantage.

The studies also had attempted to explore the relationship between gender and personality cum learning styles. Davenport (1986), Riding and Banner (1988), Riding and Boardman (1983) found gender differences in learning styles cum personality traits. Davenport's (1986) study indicated that males scored significantly higher on the abstract sequential channel and females scored significantly higher on abstract random channel. Harless (1996) found relationship between gender and learning styles, achieving styles, and learning strategies.

The objective of this study is to investigate the relationship between students' personality type identified through the MBTI® preferences and their academic performance and adjustment in the engineering faculty and to assess gender differences.

1.2. Rationale

The need of the study of personality traits as predictors of academic performance is felt because of the following reasons:

- First, it was been observed that personality traits influence the behavioural tendencies which shows an influence on academic success. Rothstein, Paunonen, Rush, and King (1994) have argued that, ''to the extent that evaluations of performance in [an academic] program are influenced by characteristic modes of behavior such as perseverance, conscientiousness, talkativeness, dominance, and so forth, individual differences in specific personality traits justifiably can be hypothesized to be related to scholastic success'' (p. 517).
- A second argument for personality traits as predictors of academic performance is that, cognitive ability reflects what an individual can do, whereas personality traits reflect what an individual will do (Furnham & Chamorro-Premuzic, 2004). Further it felt that long-term academic performance may be more accurately predicted by mapping traits of students.
- A third reason for an attempt to focus on personality traits as predictors of academic achievement is that because research states that measures of cognitive ability might lose their predictive power at this higher and professional level of education (Furnham, Chamorro-Premuzic,& McDougall, 2003). Henceforth this study to evaluate the present trend.
- Fourth reason to assess whether is there a trait of the student which fetches performance and high adjustment in relation to the chosen subject.. With this perspective in view the present study made an attempt to examine the personality trait of engineering student in relation to academic performance and

adjustment. This study sought to explore the influence of personality trait in a professional course, namely, Engineering and also examine the relationship of adjustment.

1.3 Purpose of the Study

The purpose of the study was to investigate patterns in psychological type among students in an engineering course and differences in the academic performance of those students associated with differences in psychological types and their adjustment level. The study attempted to assess the engineering students from the college of Engineering at Vishapatnam, India regarding the wide variation of student performance in the course. The impetus of the study is evolved to investigate the extent to which variation in student achievement in the course might be associated with variables related to the realm of learning; specifically the matching up of personality types cum learning styles with the course undertaken or the matching up of learning and teaching styles and understanding the level of adjustment problems among students.

Research questions postulated by investigators in this study included:

- What patterns of personality types were manifested among students in the engineering course?
- Were significant differences in academic achievement among students in the engineering course associated with differences in the personality types or mental ability (Intelligence, IQ) of students?
- Were difference in the personality types results in having adjustment problem among students in the engineering course.
- Whether there is a significant gender differences, among students associated with different personality types.

1.4 Hypothesis

- There would be a significant variation in academic performance and in selection test among students in the engineering course in relation to their personality type.
- There would not be a significant variation in mental ability (Intelligence) among students in the engineering course in relation to their personality type.
- There would be significant variation in adjustment among students in the engineering course in relation to their personality types.
- There would not be a significant variation in academic performance and in selection among boys and girls students in the engineering course in relation to their personality types.

2 Method

2.1 Research Design:

Depending on the nature and purpose of the study, professional students of the engineering college students were selected and required data was collected from them. As such, the study may be considered expost-facto field study. The dependent variable is academic performance and the independent variable is personality types (Sensing – Thinking Types and Feeling –Intuitive Types), Mental ability (IQ), Selection test, (Engineering, Agriculture and Medical Common Entrance Exam (EAMCET) and adjustment problems.

2.2 Participants:

A total of 272 students in the third year engineering course. Out of 272 students, 73 were from the university engineering college and 199 students from a private engineering college. The criteria for sample selection used were the students from all branches of engineering, studying the third year of engineering were taken. Third year were selected to avoid dropouts and to get academic performance for at least two years. It was also felt that such a time specification would enable the investigator to obtain a more reliable estimate of the academic performance of the students in the first two years of their study. The criterion for sample selection was random sampling.

2.3Variables:

The dependent variable in this study is academic performance and independent variables are personality types, mental ability (IQ), and selection test (EAMCET) and adjustment problems. The selection test is the entrance exam for engineering course (Engineering, Agriculture and Medical Common Entrance Exam (EAMCET) scores, mean =10071.79, SD = 9955.63), academic performance (aggregate percentage of marks of 1st and 2nd years of engineering course, mean = 67%, SD = 7.84) and Scores on CFIT (Mental ability, mean = 23.76, SD = 4.51) and personality styles variable(MBTI) is Thinking-Sensing Styles(T-S) students (81%), Feeling-Intuitive Styles (F-I) (19%) and adjustment problems are academic problems (M = 4.8,SD= 2.13) social problems (M= 2.53, SD=1.65) and family problems (M= 2.70, SD = 1.88) and total problem (M= 10.12, SD= 3.99).

2.4: Measures:

2.4.1 Assessment of Mental Ability (IQ) : In this study, Culture Fair Intelligence Test (CFIT) -Scale 3 is preferred. Since the CFIT Scale 3 takes a shorter time to administer and measure fluid intelligence, it was

preferred over the Raven's Progressive Matrices. The reliability of the test has been evaluated both in terms of dependability coefficient (0.84 to 0.94) and the homogeneity coefficient (0.82 to 0.95).

2.4.2 Assessment of personality Style: In this study Myers-Briggs Type Indicator was used as it is widely used. The Myers-Briggs Type Indicator is a self-report questionnaire designed to make Jung' s theory of psychological types. In the present study Form G has been used. The Form G consists of 126 items. It takes about 30-40 minutes to complete the test. The Myers Briggs Type Indicator®, MBTI® has been widely used to assess personality type and learning styles. It has been employed in research to investigate the relationship between learning styles and academic performance of engineering students (Felder and Brent, 2005) as well as studies concerning the effects of personality type in engineering education (McCaulley et. al, 1983). A number of significant correlations (weak and moderate) were found between learning style behaviors, MBTI dimensions, and academic achievement that agree with previous MBTI research. The internal consistency of the four MBTI scales is high in all samples available to date, whether computed using logical split-half, ranging from 0.82 to 0.92 consecutive item split-half, or coefficient alpha.

The MBTI instrument identifies four separate dichotomies: Extroversion versus Introversion, Sensing versus Intuition, Thinking versus Feeling, and Judging versus Perceiving. These types can also be compressed into the following two types based on traits: Thinking-Sensing (ESFP, ESTP, ISTJ, ISFJ, ESTJ, ENTJ, ISTP, INTP) and Feeling- Intuition (ENTP, ENFP, INTJ, INFJ, ESFJ, ENFJ, ISFP, INFP).

2.4.3 Assessment of Student Problems: Assessment of Adjustment Problems: Student Problem checklist prepared by the researcher. This checklist is developed on the basis of the problems observed in the engineering students. The main reason for developing this checklist was because of not finding a suitable scale.

2.5 Procedure:

As mentioned earlier, the sample was selected from the Andhra University and Engineering College, as a public educational institution and Private College of Engineering. All the assessment tools were administered on two separate days in each of the colleges. The subjects were tested in a conducive environment, with suitable breaks in between. Standard instructions for each scale were given accordingly.

2.6 Data Analysis:

In addition to the descriptive statistics such as frequency, percentage, mean and standard deviation, the inferential statistics like t-test are carried out to identify the significant of academic performer and mental ability (IQ) and selection exam (EAMCET) between Thinking –Sensing (T-S) and Feeling - Intuitive (F–I) personality styles.

3 Findings:

3.1Ability and Adjustment problem in relation to Personality styles

Results found out using various statistical measures. Firstly the study attempts to do F tests on the four learning styles (Feeling, Thinking, Intuitive, Sensing) which showed the results of Thinking - Sensing (EAMCET Selection test 9000/9,500), (Marks percentage- 68%/67%), (Mental ability raw score - 23/23) and Feeling - Intuitive (EAMCET Selection test-13,000 /14,000), (Marks percentage -(65%/64%), (Mental ability raw score - 23/23) by taking this into consideration the means of all variables, it felt conceivable that a combination of styles may be more indicative of differences on the relevant variables and henceforth the Thinking -Sensing and Feeling -Intuitive combinations has been derived and secondly the study attempts to explore the ability and adjustment among T-S and F-I learning styles. In support to Hypothesis no.1, it was found that the mean of selection test scores of T-S (9,368) and F-I (12,927) styles. The difference is significant at the 5% level.

Table I Personality styles and their Abilities and Adjustment Problems

As shown in the Table I, participants mean of academic performance in terms of their learning styles were M=65 for F-I types and M= 68 for T-S types. This finding suggests that T-S subjects are better academic performers ($t = 2.16$, $p < 0.01$ level) and have better selection test ranks ($t= 2.31$, $p <.01$) than the F-I group. However both these learning groups are not significantly different with respect to mental ability ($t=.04$, $p >.05$). People who choose areas that are compatible with their personality styles are better in their performance. This suggests that T-S types are suitable for engineering course.

With regard to social problems, it is observed that the Feeling-Intuitive styles students manifest more social problems than the Sensing-Thinking styles of group, which is significant ($t = 1.98$, $p < .01$). In the case of total problems marginal significance is observed. The F-I styles students manifest more problems than the S-T typesOn the whole the Feeling-Intuitive types manifest more problems than the Sensing-Thinking styles of students.

3.2 Socio -demographic differences among different personality traits.

Male and female students were roughly divided equally in both the groups with 37% - 39% women and 62 –

63% men students. The sample reveals that though males are more in number than females in both the groups the chi-square is not significant indicating that these groups were not significantly different in composition.

Table 2 Socio - Demographic Differences between Personality/Learning Style Groups

4 Discussions and Conclusion

The objective of this study was to examine the relation between academic performance, the performance in the selection test (EAMCET), intelligence, personality styles, and adjustment. The combination of S-T types and F-I types of students are taken into consideration, differences are observed in their selection test ranks and academic test performance. The F-I types of students show low performance in selection and academic examination, but the mental ability is the same for both the group of students. As Sternberg (1997) stated, "we repeatedly confuse styles with abilities, resulting in individual differences that are really due to styles being viewed due to abilities." Although there are no differences between the two groups in the performance, in the intelligence since tests suggests the F-I types demonstrate lower performance in the selection and class exams while T-S types show higher performance among engineering students which is partially supported by Kolb's (1981) findings that each field of study has its unique characteristics and that people who choose areas that are compatible with their learning styles are better in their performance. . Henceforth, T-S whose choose compatible course shows better performance.

In congruence with the findings of the present study, Cook (1997) using Kolb's Learning Styles Inventory (LSI) found a great diversity in the learning styles of the students. He concluded that divergers and assimilators have a great difficulty academically than the convergers and accommodators which are equivalent to Feeling- Intuitive and Thinking-Sensing and according to Dangwal and Mitra (1998), Stice (1987) convergers are best at finding practical uses for ideas and theories and usually do well on conventional tests.

With regard to adjustment, the S-T and F-I groups had no differences, on academic and family problems while there are differences on social problems with the F-I group having more social problems than the S-T group. Overall, the F-I group has more total problems though it was marginally significantly different from that of S-T groups. These results when viewed in the light of Cooks' (1997) and Dangwal and Mitra's (1998) results confirm the findings that Sensing -Thinking types which are equivalent to accommodation and convergence dimension do better academically and are likely to have less problems than the divergence- assimilation which are equivalent to Feeling - Intuitive type. As Sternberg (1997) stated that the people whose learning styles/thinking styles do not match the expectations are derogated for all wrong reasons. What is seen, as intransigence may actually be nothing more than a mismatch between the learning styles. From the analysis it is also become evident that mental ability remains the same for both T-S and F-I groups. This suggests which reflects that it is not the ability but the styles and matching of personality/learning styles with ability that actually plays a crucial role in performing well in the exams. Similarly, McCaulley also found a fairly balanced distribution between Sensing types and Intuitive types. The majority of the participants in this study, however, exhibited a preference for Sensing (72%) while only 23% preferred Intuition.

The academic performance of students who preferred Thinking was significantly higher than those who preferred Feeling, and the effect size was large. This finding is consistent with those of prior studies (Rosati, 1993; Rosati, 1999;) and with type theory, which suggests that the objective and impersonal nature of engineering subjects would be conducive for students who preferred Thinking but may not be engaging for students who preferred Feeling. This suggests a need for a better balance in the course design between technical and social aspects of engineer.

Comparing individual personality types and cumulative average scores clearly showed that engineering students who preferred Thinking performed better than those who preferred Feeling. This finding strongly suggests that consideration needs to be given to balance the course design between technical and social aspects of engineering in order to increase its relevance to Feeling learners.

The socio-demographic variables like gender shows no significant differences between the two types of learning styles. TS and FI are almost equally distributed among gender. These personality styles are not gender specific. Similarly, Dart and others (1999) show very small gender differences in perceptions of learning environments and approaches. While Pokay and Blumenfeld (1990) studies show no gender differences.

Given the findings related to academic achievement, this pattern may hold significant implications for engineering education. However, as this distribution may be only an artifact of a relatively small sample of 272 participants. This preference of personality types should be confirmed by additional research. The significant amount of variance in academic achievement among students suggests that engineering faculty is confronted with a very serious challenge to find ways of helping feeling -intuitive students learn more effectively; however the thinking –sensing students should be helped also. The holistic approaches to teaching and learning in this

course, more may be needed.

Perhaps a more systematic approach to analyzing the differing needs and preferences of Feeling - Intuitive students, and then providing them with different types of learning opportunities highly congruent with their respective styles would reduce the variance in achievement and help all students perform at a higher level in the course. As aforementioned the Felder and Silverman (1983) articulated the same idea in a slightly different way: `The hypothesis . . . is that engineering instructors who adapt their teaching style to include both poles of each of the given dimensions should come close to providing an optimal learning environment for most (if not all) students in a class' [9, p. 675].

Therefore, it is imperative that engineering faculty come to value, respect, and accommodate the learning needs and preferences of both types of students. The holistic learning - teaching environment should be provided so that all students get benefitted. Engineering educators have a responsibility both to their students and their profession to respond in substantive and meaningful ways to research into the nature of individual differences and understand their requirements.

References

Ackerman, P. L., Bowen, K. R., Beier, M. E.,& Kanfer, R. (2001). Determinants of individual differences and gender differences in knowledge. *Journal of Educational Psychology*, 93, 797–825.

Ackerman, P. L., & Heggestad, E. D. (1997). Intelligence, personality and interests: Evidence for overlapping traits. *Psychological Bulletin*, 121, 219–245.

Aluja-Fabregat, A., & Blanch, A. (2004). Socialized personality, scholastic aptitudes, study habits, and academic achievement: Exploring the link. *European Journal of Psychological Assessment*, 20, 157–165.

Barbaranelli, C., Caprara, G. V., Rabasca, A., & Pastorelli, C. (2003). A questionnaire for measuring the big five in late childhood. *Personality and Individual Differences*, 32, 645–664.

Chamorro-Premuzic, T.,& Furnham, A. (2003). Personality traits and academic examination performance. European Journal of Personality, 17, 237–250.

Chamorro-Premuzic, T., & Furnham, A. (2006). Intellectual competence and the intelligent personality: A third way in differential psychology. Review of General Psychology, 10, 251–267.

Chamorro-Premuzic, T., & Furnham, A. (2005). Personality and intellectual competence. New Jersey: Lawrence Erlbaum Associates.

Cook, M. J. (1997). An exploratory study of learning styles as a predictor of college academic adjustment. *Unpublished manuscript*, Fairfield University, Fairfield, CT.

Cronbach, L. J. (1954). Educational Psychology. New York: Harcourt Brace and Co., 260.

Dangwal, R., & Mitra, S. (1998). Learning Styles Inventory- In the Asian Context. Journal of *Psychological Researches*, 42(3), 138-145.

Dart, B., Burnett, P., Boulton-Lewis. G., Campbell, J., Smith, D., & McCrindle, A. (1999). Classroom learning environments and students' approaches to learning. *Learning Environments Research*, 2(2), 137-156.

Davenport, J. A. (1986). Learning style and its relationship to gender and age among elder hostel participants. *Educational Gerontology*, 12 (3), 205-217.

De Raad, B., & Schouwenburg, H. C. (1996). Personality in learning and education: A review. *European Journal of Personality*, 10, 303–336.

Eysenck, H. J. (1996). Personality and the experimental study of education. *European Journal of Personality*, 10, 427–439.

Farsides, T., & Woodfield, R. (2003). Individual differences and undergraduate academic success: The roles of personality, intelligence, and application. *Personality and Individual Differences*, 34, 1225–1243.

Felder, R.M., and Brent,R. Cooperative Learning in Technical Courses: Procedures, Pitfalls, and Payoffs, *ERIC Document Reproduction Service*, ED-377038, 1994.

Felder, R. M. Forrest, K. D. Baker-Ward, L. Dietz, E. J. and Mohr, P. H. (1993). A longitudinal study of engineering student performance and retention: I. Success and failure in the introductory course, *J.Engineering Education*, 82, 1, pp. 15±21.

Felder, R. M. and Silverman, L. K. (1988).Learning and teaching styles in engineering education, *Engineering Education*, 78, 4, 674-681.

Furnham, A., Chamorro-Premuzic, T., & McDougall, F. (2003). Personality, cognitive ability, and beliefs about intelligence as predictors of academic performance. *Learning and Individual Differences*, 14, 49–66.

Gardner,H. (1993).Multiple Intelligences: The Theory in Practice, New York: Basic Books

Hair, E. C., & Graziano, W. G. (2003). Self-esteem, personality and achievement in high school: A prospective longitudinal study in Texas. *Journal of Personality*, 71, 971–994.

Harless, D. K. (1996). A comparison of gender differences in the relationship among learning styles, achieving styles and study strategies of college students. Dissertation Abstracts International Section A: Humanities & Social Sciences, 56(7-A), 2575.

Heaven, P. C. L., Mak, A., Barry, J.,&Ciarrochi, J. (2002). Personality and family influences on adolescent attitudes to school and self-rated academic performance. Personality and Individual Differences, 32, 453–462.

Jung, C. G. Psychological Types, (H. G. Baynes, trans., revised R. F. C. Hull) Volume 6 of The Collected Works of C. G. Jung, Princeton, NJ: Princeton University Press (1971).(Original work published in 1921.)

Keefe, J.W. (1982). Assessing student learning styles: an overview, in J. W. Keefe (ed.), Student Learning Styles and Brain Behavior, Reston, VA: National Association of Secondary School Principals pp. 43±53.

Kolb, D.A. (1981). Learning styles and disciplinary differences. In A.W. Chickering and Associates (Eds). The Modern American College, San Francisco: Jossey Ban.

Maqsud, M. (1993). Relationships of some personality variables to academic attainment of secondary school pupils. Educational Psychology, 13, 11–18.

McCaulley, M.H , Godleski, E.S. Yokomoto, C. F, Harrisberger. L and Sloan, E.D. (1983). Applications of psychological type in engineering education, *Engineering Education*, 73, 5, pp. 394±400.

McCaulley, M.H, Macdaid, G. P and. Walsh, R.(1987) Myers-Briggs Type Indicator and retention in engineering, *Int. J. Applied Engineering*, 3, 2, pp. 99±109.

McCauley, M. H. (1990). The MBTI and individual pathways in engineering design, *Engineering Education*, 80, pp. 537±542.

McCaulley, M.H., Macdaid, G.P. and Granade, J.G. (1985) "ASEE-MBTI Engineering Consortium: Report of the First Five Years," *Proceedings,1985 ASEE Annual Conference*, ASEE.

Myers,I.B. and M. H. McCaulley,M.H. (1985).Manual: A Guide to the Development and Use of the Myers-Briggs Type Indicator, Palo Alto, CA: Consulting Psychologists Press.

Myers, I.B. (1993). Introduction to Type (5th ed.), Palo Alto, CA: Consulting Psychologists Press .

Pokay, P., & Blumenfeld, P. C. (1990). Predicting achievement early and late in the semester: The role of motivation and use of learning strategies. Journal of Educational Psychology, 82(1), 41-50.

Riding, R.J., & Banner, G.E. (1988). Sex and personality differences in French and German performance in British secondary school pupils. European Journal of Psychology of Education, 3 (1), 65-75.

Riding, R. J., & Boardman, D.J. (1983). The relationship between sex and learning style and graphicacy in fourteen-year-old children. Educational Review, 35(1), 69-79.

Rothstein, M. G., Paunonen, S. V., Rush, J. C., & King, G. A. (1994). Personality and cognitive ability predictors of performance in graduate business school. Journal of Educational Psychology, 86, 516–530.

Slobodskaya, H. R., Safronova, M. V., & Windle, M. (2005). Personality, temperament and adolescent adjustment in modern Russia. Personality and Individual Differences, 39, 167–178.

Sternberg, R. J. (1977). Intelligence, information-processing and analogical reasoning: The componential analysis of human abilities. Hillsdale, NJ: Erlbaum.Stern berg, R. J. (1997). Thinking Styles. Cambridge University Press.

Rosati, P. (1993). "Student Retention from First-Year Engineering Related to Personality Type," Proceedings, Frontiers in Education Conference, IEEE, 1993.

Rosati, P. (1999). "A Personality Type Perspective of Canadian Engineering Students," Proceedings Annual Conference of the Canadian Society of Civil Engineering, CSCE,

Wankat, P., and Oreovicz, F. (1993), Teach*ing Engineering,* McGraw-Hill, New York, p. 253.

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Table I Personality styles and their Abilities and Adjustment Problems

Ability	Thinking - Sensing Styles (T-S)		Feeling-Intuitive Styles (F-I)		t-value
	(n = 220)		(n = 52)		
	Mean	SD	Mean	SD	
EAMCET Ranks	9,368	8,790.52	12,927.67	13,464.82	2.31*
Academic Performance (Marks Percentage)	67.53	7.6	64.94	8.52	2.16*
Mental Ability (IQ, raw score)	23.82	4.34	23.54	5.23	0.4
Adjustment Problems	Mean	SD	Mean	SD	t-value
Total Problems	9.9	3.98	11.08	3.96	1.92†

**p < .05 † p < .10 marginally significant*

Table 2 Socio - Demographic Differences between Personality/Learning Style Groups

Gender	Sensing – Thinking Type (n = 220) Percentage	Feeling – Intuitive Type (n = 52) Percentage	Chi - Square
Female	36.80	38.50	0.13
Male	63.20	61.50	
Institution - Public/ Private			
Public Institution	26.40	28.80	0.13
Private Institution	73.60	71.20	
Caste			
Forward Caste	57.30	59.60	0.78
Backward Caste	30.50	25.00	
Scheduled Castes & Tribes	12.30	15.40	