

Personality Type and Birth Order of Women Engineering Students



Preetha Menon, TK Anurekha

Abstract: *The present study attempted to assess the psychological types of women engineering students using MBTI (Myers Briggs Type Indicator) and to examine the effects of birth order on personality type. The participants (N=338) on the average scored high on extraversion, sensing, thinking and judging (ESTJ). The most identified personality types were Extraversion-Sensing-Thinking-Judging (ESTJ) and Extraversion-Sensing-Thinking-Perceiving (ESTP). The least common personality types were Introversion-Intuitive-Feeling-Perceiving (INFP), and Introversion-Intuitive-Thinking-Judging (INTJ). Cross tabulation examined relationships between personality type and birth order. Results of the study indicated that birth order has bare minimal statistically insignificant effect on the personality type. The present study is anticipated to afford the higher education sector with pertinent information for framing the university admission policies with regards to the career path. Longitudinal studies, to determine an individual's birth order effects on personality and other variables such as self-worth and contentment with life are recommended. Validation of the results of the study is possible with future research on a larger population of women pursuing varied disciplines.*

Key words: Birth order, personality type, psychological type, MBTI, career guidance, career counselling

I. INTRODUCTION

The debate over the influence of an individual's birth order position among siblings on the individual's course of life has fascinated the scientific community for at least a hundred years. Birth order is a widely studied and debated concept, which has evoked strong/passionate arguments.

Birth order has been consistently deployed, in research, since Alfred Adler first introduced the concept in 1918 (Cervone & Pervin, 2008). Birth order, as a variable was used in his work, blending it with aspects such as family structure, number of siblings etc. in the assessment of lifestyles (Ansbacher & Ansbacher, 1956). Adler believed that an individual's birth order had substantial impact on his/her lifestyle, ways of relating to tasks at hand, and outlook towards, love, play and work (Adler, 1964).

According to Shulman and Mosak (1977), birth order can be viewed as the ordinal position and as the psychological position, based on the role assumed by the individual in its interactions with siblings.

Adler laid special focus on the psychological position of a child; he insisted that it is not the child's character that is influenced by its birth order sequence, but rather the situation into which they are born, and the subsequent interpretation. The concepts of ordinal and the psychological positions have been researched widely.

Ernst and Angst (1983) conducted thorough analyses of published studies from 1946 to 1980; they deduced that most confirmed influences of birth order on personality were the results of studies which lacked rigour in design. They found no sizable impact of birth order on human personality in a study done on a cross-section of 6,315 youngsters from Switzerland.

Based on the confirmable results across samples and research designs, birth order does not have an enduring influence on personality traits, outside the academic domain (Rohrer, Egloff & Schmukle, 2015). 'Born to Rebel' published by Sulloway (1996) offered a different conceptual outlook on birth order. He held that an individual's growth is explained by the overt behaviour based on life experiences and not birth order within a family. Regardless of a steady surge of research, results continued to be ambiguous and disputed (Daminan & Roberts, 2015). One of the objectives of the present study has been to inquire into the effect of birth order on the personality type of participants.

1.1 Personality

Personality refers to unique patterns of behaving, feeling, and thinking due to biological and environmental factors (Kazdin, 2000). Meta-analytic research indicates the effect of personality on life outcomes like occupational attainment and calls attention for routine assessment of personality in quality of life surveys. Such investigations inspire deeper probes on personality traits and the manner in which these characteristics affect manifold life outcomes.

In his seminal work, Psychological Types, Carl Jung (1923) insightfully explained the organized ways in which people vary in personality. Jung held that people could have four orientations in perceiving the world - sensing, intuitive, thinking, and feeling. Psychological Types helps understand the varied ways in which individuals perceive the world, and formulate judgments.

The Myers Briggs Type Indicator (MBTI) was evolved by Katherine Cook Briggs and Isabel Briggs Myers, as practical applications of Jung's theory. Since its publication in 1955, MBTI has been widely applied in the education, counselling and business. A large amount of published material has been found on the MBTI concept (Campbell & Davis, 1988).

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MBTI is one of the most extensively used measures of psychological types, since its first launch in 1962 (Hirsh & Kummerow, 1989). Another major advantage of MBTI is that it is occupation-centric (Briggs & Myers, 1980), which works well when analysing engineering students. Importance is placed on exploring the personality types that work well within the realm of engineering.

MBTI is extensively used in understanding group dynamics, making career choices and leadership in business. Many organizations lean on MBTI, to aid managers discern their communication styles, and acknowledge and appreciate others' viewpoints.

ESTJ (24%) was the most common of the personality types among the women participants (women participants $n = 1538$) of the survey done on 7,744 Indian respondents by CPP Inc., USA (Shaubhut & Thompson, 2017). Since the sampling was of convenience, the report could be viewed only as psychometric information.

The analyses reported that the quantification properties of the evaluation were sufficient for the Indian sample. Hence, MBTI can be widely used on Indians residing in India and who could read English. As MBTI is widely used in India, larger population could be studied, and the assessment properties of MBTI will continue to be evaluated (Shaubhut & Thompson, 2017).

An issue that frequently crops up in studies on personality types is whether one can rely on the constancy of the personality types, across developmental stages and gender. Stability and variation in personality were analysed, by examination of personality types across adulthood and old age, based on two studies: Germany ($N = 14\ 718$; Age group: 16 – 82 years) and Australia ($N = 8\ 315$; Age group: 15 – 79 years). In this study, the Big Five personality traits were assessed twice, over four years; findings affirm that in both the nations, personality types were stable across gender, age, and time. The results provide additional insights, recommending that the personality type theory constitute a robust classification system that helps the categorization of individual differences in personality traits (Specht, Luhmann & Geiser, 2014).

The participants of the present study are all women students, in their final year of engineering studies. One may doubt that none of the studies reviewed had all-female participants and that a generalisation of genders may be ineffective. However, findings based on 46 meta-analyses maintain the hypothesis on gender similarities. Gender differences can be different at different ages, and depend on the circumstances, in which assessments were made. Exaggerated assertions of gender differences brings in considerable costs at workplace and in relationships (Hyde, 2005).

1.2 Stereotyping Personality

The personality type *preference* of Sensing-Intuitive, seems to have established connection to creativity and learning styles (Shen, Prior, White & Karamanoglu, 2015).

A longitudinal, MBTI-based study of seven years on a population of engineering students, at the University of Western Ontario, was conducted to record students' academic success in the engineering programs, and the ensuing satisfaction in the engineering profession, based on

personality type. Data of the first five years indicated successful graduation of women with Introversion-Thinking-Judging types, and graduation in four years by women was fairly consistent with Introversion-Sensing-Thinking-Judging types (Rosati, 1997).

Hammer (1996) observed that Introverted-Intuitive-Thinking-Judging (INTJ) Types do well in positions that can use their logical thinking preferences, to synthesize information and draw conclusions evolving into a measurable difference in the real world. These characteristics and attributes contribute to INTJ's satisfaction in fields such as Industrial Engineering. INTP-Introverted (I), Intuitive (N), Thinking (T) and Perceiving (P) is generally represented as the 'Engineer' type (Myers et al., 1998).

A compiled presentation of results of 5 MBTI assessments on software engineering practitioners in the USA was done by Sach, Petre and Sharp (2010) to explain the personality of a software engineers. The results indicated a large preference towards thinkers and judgers. The present study attempts at outlining a profile of women engineering students, which is particularly important in a profession that is home to rampant erroneous stereotyping.

It is widely believed that academic achievement in high school, college-entrance test scores, and exposure to courses like mathematics, are good predictors of successful career in engineering. Generally, disinterest with the students in the engineering field could be triggered by the following factors: (1) unsatisfactory academic achievement in mathematics and science subjects prior to engineering admission, (2) students perceiving themselves disparate with their peers in the engineering discipline, and (3) difficulty in communication with teachers and peers due to personality variations. Given these factors, personality type theory can be used to envision motivation and endurance in continuing with engineering courses that the individuals have chosen.

According to a report on the All India Survey on Higher Education 2018-2019 (Dept. of Higher Education, MHRD, GOI), Engineering and Technology is the fourth major stream with 38.52 lakh (1 lakh = 10^5) student's enrolment. The share of male students enrolled in Engineering and Technology was 71.1 % whereas female enrolment was 28.9 %. In light of such under-representation of women, there was a curiosity to look at the personality types of the 338 women participants from the final year engineering graduate program.

II. METHOD

2.1 Objectives

The objectives of this probe were:

- To study the psychological preferences of the participants using MBTI
- To determine the correlation between participants' psychological type and their birth order



2.2 Participants

Subjects for this investigation were selected from a women’s university from South India. Three hundred and thirty eight (338), final year engineering women undergraduates were recruited by purposive sampling. The age of the participants ranged from 21 to 24 years. The students were from the following branches of Faculties of Engineering: Information Technology, Electronics and Communication, Biomedical & Instrumentation, Computer Science, Electrical and Electronics, Food processing and Preservation Technology, Civil Engineering and Printing Technology.

2.3 Measures

2.3.1 Informed Consent Form

Prior to the launch of this investigation, the subjects were required to express their voluntary consent for participation/nonparticipation. The consent form clearly stated the description and the objective of the study.

2.3.2 Case Study Schedule

The schedule was meant to obtain the demographic data of the participants (age, birth order, number of siblings and engineering faculty/department)

2.3.4 Myers -Briggs Type Indicator (MBTI)

MBTI is a self-analysing questionnaire to assess psychological preferences in the way people perceive the world and make decisions. The dichotomies specified in MBTI are: Extraversion (E) / Introversion (I), Sensing (S) / Intuition (N), Thinking (T)/ Feeling (F), and Judging (J)/ Perceiving (P).

2.3.5 Statistical Package for the Social Science (SPSS 21)

Version 21 of SPSS was used to perform data entry, analysis and create tables and graphs.

2.4 Procedure

After expression of their willingness to be a part of the study, the respondents completed the Case Study Schedule and the MBTI.

III. RESULTS AND DISCUSSION

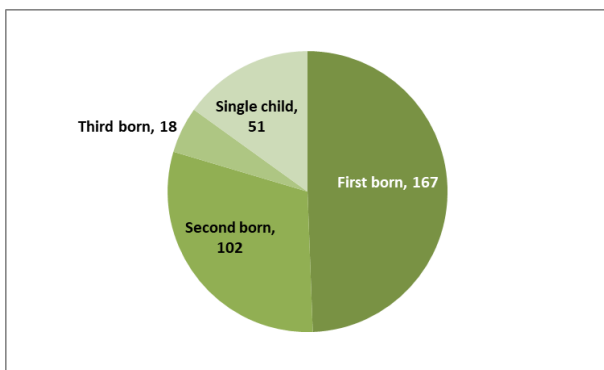


Figure 1 Showing the Birth Order of the Participants

Figure 1 shows that 49.41 % (167) of the participants were first born, 30.18 % (102) were second born, 5.33 % (18) were third born and 15.09 % (51) were single child, in the family.

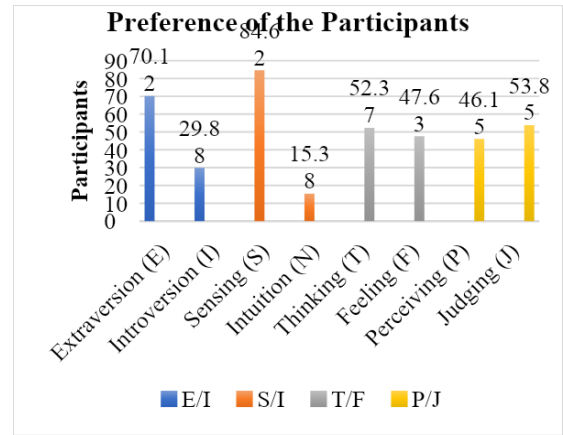


Figure 2 Showing the Preferences of the Participants

Figure 2 indicates that there is a skew towards Extraversion (E- 70.12) and Sensing (S- 84.62). Extraversion is a tendency to focus on the outside world. The participants might represent the youth group which enjoy and feel perked up by social gatherings and group activities. As sensing types, they might see things as they are, might be practical and value common sense.

More than half of the participants are Thinking (T-52.37) and Judging (J- 53.85) types. Very less number of participants rely on Intuition (N- 15.38). The participants might take decisions based on facts and tend to interpret situations and others based on logic. They might be critical thinkers who are oriented toward problem solving. As possessing a judging quality, the participants might value rules and regulations; they might insist on completion of tasks.

Looking at Figure 2, we can say that the group has the personality type of ESTJ.

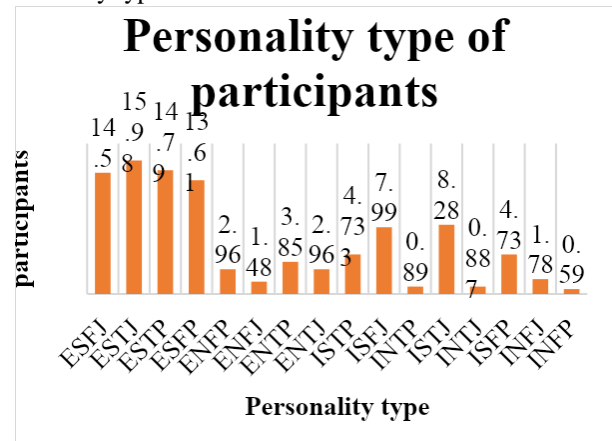


Figure 3 Showing the Personality Types of the Participants

The most common personality types (Figure 3) among the participants are ESTJ, ESTP and ESFJ. The least common personality types are INFP, INTJ and INTP. ESTJ indicates of a person who is perked up by associating with others, who focuses on facts and data, who decides on the bases of logic and reason and who is organized rather than spontaneous.

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ESTJs are also referred to as Supervisor personalities because they are inclined towards taking charge and making sure things are done correctly.

Meta-analyses of four studies were conducted to examine gender dissimilarities in personality, presented in the literature (from 1958 to 1992) and in standardized data for popular personality questionnaires (from 1940 to 1992). In line with the present study, females scored more than males on extraversion (Feingold, 1994). No one personality type is regarded as superior or inferior, but certain types are considered to be more comfortable or skilled in certain contexts or roles.

Table 1: Distribution of Personality Types in each Birth Order

Personality Type	Single Child	First born	Second born	Third born	Total
ESFJ	5	27	15	2	49
ESTJ	5	32	15	2	54
ESTP	10	20	17	3	50
ESFP	7	21	15	3	46
ENFP	4	4	2	0	10
ENFJ	1	1	2	1	5
ENTP	1	7	5	0	13
ENTJ	2	6	2	0	10
ISTP	1	9	5	1	16
ISFJ	5	10	11	1	27
INTP	0	2	1	0	3
ISTJ	5	15	4	4	28
INTJ	2	0	1	0	3
ISFP	2	9	4	1	16
INFJ	0	3	3	0	6
INFP	1	1	0	0	2

Table 1 indicates that more than half (55 %) of ESFJ and ESTJ (59.26 %) are first born.

Similar to the current study using MBTI, in a survey to collect personality profiles of 92 software engineering students in an Asian country, it was found SJs (Sensing and Judging) were the dominant temperaments (Raza, Mustafa & Capretz, 2011). In a study done on 229 management students, ESTJ type was common in the management population followed by ISTJ type (Tyagi, 2008).

INTP- Introverted (I), Intuitive (N), Thinking (T) and Perceiving (P) is generally represented as the 'Engineer' type (Myers et al., 1998). Although the participants of the present study are engineering graduates, ESTJ (15.98 %), ESTP (14.79 %) and ESFJ (14.50 %) types have more representation.

Thinking and judging personality inclinations are usually seen, while feeling and perceiving were uncommon in a group of software engineering students (Sach, Petre & Sharp, 2010). In our current study too, ESTJ (59.26%) is the most common personality type.

Table 2: Cross Tabulation of Birth order and Personality Types

Cross tabulation (Table 2) examined relationships between personality type and birth order of the participants. Results indicated that the birth order has very negligible impact on the personality type of participants and the effect is statistically insignificant.

Table 2: MBTI-Birth order Crosstabulation

		MBTI Type * BirthOrder Crosstabulation					Total
		BirthOrder				Count	
		First Child	Second Child	Third Child	Single Child		
MBTI	Type	Count	²⁷ a	¹⁵ a	² a	⁵ a	49
		% within MBTI Type	55.10 %	30.60 %	4.10 %	10.20 %	100.00 %
		% within BirthOrder	16.20 %	14.70 %	11.10 %	9.80 %	14.50 %
		% of Total	8.00 %	4.40 %	0.60 %	1.50 %	14.50 %
ESFJ	Type	Count	³² a	¹⁵ a	² a	⁵ a	54
		% within MBTI Type	59.30 %	27.80 %	3.70 %	9.30 %	100.00 %
		% within BirthOrder	19.20 %	14.70 %	11.10 %	9.80 %	16.00 %
		% of Total	9.50 %	4.40 %	0.60 %	1.50 %	16.00 %
ESTJ	Type	Count	²⁰ a	¹⁷ a	³ a	¹⁰ a	50
		% within MBTI Type	40.00 %	34.00 %	6.00 %	20.00 %	100.00 %
		% within BirthOrder	12.00 %	16.70 %	16.70 %	19.60 %	14.80 %
		% of Total	5.90 %	5.00 %	0.90 %	3.00 %	14.80 %
ESTP	Type	Count	²¹ a	¹⁵ a	³ a	⁷ a	46
		% within MBTI Type	45.70 %	32.60 %	6.50 %	15.20 %	100.00 %
		% within BirthOrder	12.60 %	14.70 %	16.70 %	13.70 %	13.60 %
		% of Total	6.20 %	4.40 %	0.90 %	2.10 %	13.60 %
ESFP	Type	Count	⁴ a	² a	⁰ a	⁴ a	10
		% within MBTI Type	40.00 %	20.00 %	0.00 %	40.00 %	100.00 %
		% within BirthOrder	2.40 %	2.00 %	0.00 %	7.80 %	3.00 %
		% of Total	1.20 %	0.60 %	0.00 %	1.20 %	3.00 %
ENFP	Type	Count	¹ a	² a	¹ a	¹ a	5
		% within MBTI Type	20.00 %	40.00 %	20.00 %	20.00 %	100.00 %

		% within BirthOrder	0.60 %	2.00 %	5.60 %	2.00 %	1.50 %
		% of Total	0.30 %	0.60 %	0.30 %	0.30 %	1.50 %
	E N T P	Count	⁷ a	⁵ a	⁰ a	¹ a	13
		% within MBTI Type	53.80 %	38.50 %	0.00 %	7.70 %	100.00 %
		% within BirthOrder	4.20 %	4.90 %	0.00 %	2.00 %	3.80 %
		% of Total	2.10 %	1.50 %	0.00 %	0.30 %	3.80 %
	E N T J	Count	⁶ a	² a	⁰ a	² a	10
		% within MBTI Type	60.00 %	20.00 %	0.00 %	20.00 %	100.00 %
		% within BirthOrder	3.60 %	2.00 %	0.00 %	3.90 %	3.00 %
		% of Total	1.80 %	0.60 %	0.00 %	0.60 %	3.00 %
	I S T P	Count	⁹ a	⁵ a	¹ a	¹ a	16
		% within MBTI Type	56.30 %	31.30 %	6.30 %	6.30 %	100.00 %
		% within BirthOrder	5.40 %	4.90 %	5.60 %	2.00 %	4.70 %
		% of Total	2.70 %	1.50 %	0.30 %	0.30 %	4.70 %
	I S F J	Count	¹⁰ a	¹¹ a	¹ a	⁵ a	27
		% within MBTI Type	37.00 %	40.70 %	3.70 %	18.50 %	100.00 %
		% within BirthOrder	6.00 %	10.80 %	5.60 %	9.80 %	8.00 %
		% of Total	3.00 %	3.30 %	0.30 %	1.50 %	8.00 %
	I N T P	Count	² a	¹ a	⁰ a	⁰ a	3
		% within MBTI Type	66.70 %	33.30 %	0.00 %	0.00 %	100.00 %
		% within BirthOrder	1.20 %	1.00 %	0.00 %	0.00 %	0.90 %
		% of Total	0.60 %	0.30 %	0.00 %	0.00 %	0.90 %
	I S T J	Count	¹⁵ a, b	⁴ b	⁴ a	⁵ a, b	28
		% within MBTI Type	53.60 %	14.30 %	14.30 %	17.90 %	100.00 %
		% within BirthOrder	9.00 %	3.90 %	22.20 %	9.80 %	8.30 %
		% of Total	4.40 %	1.20 %	1.20 %	1.50 %	8.30 %
	I	Count	⁰ a	¹ a	⁰ a	² a	3

	N T J	% within MBTI Type	0.00 %	33.30 %	0.00 %	66.70 %	100.00 %
		% within BirthOrder	0.00 %	1.00 %	0.00 %	3.90 %	0.90 %
		% of Total	0.00 %	0.30 %	0.00 %	0.60 %	0.90 %
	I S F P	Count	⁹ a	⁴ a	¹ a	² a	16
		% within MBTI Type	56.30 %	25.00 %	6.30 %	12.50 %	100.00 %
		% within BirthOrder	5.40 %	3.90 %	5.60 %	3.90 %	4.70 %
		% of Total	2.70 %	1.20 %	0.30 %	0.60 %	4.70 %
	I N F J	Count	³ a	³ a	⁰ a	⁰ a	6
		% within MBTI Type	50.00 %	50.00 %	0.00 %	0.00 %	100.00 %
		% within BirthOrder	1.80 %	2.90 %	0.00 %	0.00 %	1.80 %
		% of Total	0.90 %	0.90 %	0.00 %	0.00 %	1.80 %
	I N F P	Count	¹ a	⁰ a	⁰ a	¹ a	2
		% within MBTI Type	50.00 %	0.00 %	0.00 %	50.00 %	100.00 %
		% within BirthOrder	0.60 %	0.00 %	0.00 %	2.00 %	0.60 %
		% of Total	0.30 %	0.00 %	0.00 %	0.30 %	0.60 %
Total		Count	167	102	18	51	338
		% within MBTI Type	49.40 %	30.20 %	5.30 %	15.10 %	100.00 %
		% within BirthOrder	100.00 %	100.00 %	100.00 %	100.00 %	100.00 %
		% of Total	49.40 %	30.20 %	5.30 %	15.10 %	100.00 %

Each subscript letter denotes a subset of BirthOrder categories whose column proportions do not differ significantly from each other at the .05 level.

III.1 Career Guidance and Counselling for the Participants

The participants were given the feedback about their personality types, in brief sessions of 50 students each. Participants who had special enquiries and counselling needs were provided brief sessions.

The current study reveals that, women students who pursue engineering stream are a distinctive group of individuals.

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It could be perceived that Career Guidance counsellors, directing non-engineering personality types away from engineering, may be offering a worthwhile service to some students. If students resolve to take up engineering despite the absence of fitness, they might fail to complete their degrees successfully. However, the field of engineering may benefit from diversity if counsellors continue to direct qualified non-engineering types to engineering programmes. According to MBTI, INTJ (Introvert-Intuitive-Thinking and Judging) is considered the 'Engineering Type' (Myers, 1975).

Career Guidance counsellors should be aware that non-engineering personality type individuals may face a distinctive set of challenges, and hence, suggestions and advices must be given accordingly. With timely and proper counselling and guidance, students make wiser career choices, they would be driven and successful in their vocations, and the field of engineering will benefit from the wide diversity of people. The basic stance of the type theory is that when there is good match between a personality and career choice, career will continue to be fascinating and fulfilling. Hence, ideally, students should seek career guidance and undergo aptitude tests and personality tests before entering the university education. Since various fields of engineering require different sets of skills, any of the 16 personality types entering the engineering field is anticipated to fit in some area or the other.

III.2 Limitations of the Study

This study was on a group of women students from the engineering discipline. To confirm the results of the study, future studies are required on bigger population of students from varied streams.

III.3

Recommendation for Further Research and Implications

Replication of this study in the future could benefit from a longitudinal examination of the measures. Longitudinal appraisals could be used to derive a more accurate assessment of an person's birth order influence on personality, over an extended period.

Instead of obtaining information exclusively on the birth order of the respondents, questions regarding family and cultural backgrounds could be included. These comprehensive findings can help obtain more understanding of the effects birth order has on personality, self-worth and life contentment, over a person's lifespan. These observations could be used to facilitate counselling by furnishing more precise evaluation of these variables, at different stages of a person's life. Future work on MBTI, could focus on establishing classifications meant for different areas of engineering. Students of diverse personality types have different motivations and priorities in their pursuit of university degrees. Longitudinal studies to determine birth order effects on personality and other traits such as self-worth and life satisfaction are recommended.

The present study is expected to provide the higher education sector, with pertinent information regarding the endeavour to mend the university policies, related to career

path. The study points out the importance of understanding individuals, by focusing on their individual differences in learning strategies, rather than by relying on the prevalent personality stereotypes.

IV. CONCLUSION

The present study attempted to explore the effect of birth order on the personality type, as measured by MBTI, of women engineering students in their final year. Results indicated statistically insignificant correlation between birth order and personality type of the participants. The most common personality types found among the participants were Extraversion-Sensing-Thinking-Judgemental and Extraversion-Sensing-Thinking-Perceiving; the least common personality types were Introversion-Intuitive-Feeling-Perceiving, and Introversion-Intuitive-Thinking-Judgemental. Students of diverse personality types have different motivations and priorities in their pursuit of university degrees. Longitudinal studies to determine birth order effects on personality and other traits such as self-worth and life satisfaction are recommended.

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