

Longitudinal Study: MBTI, Academic Performance, and Engineering Success in Canadian Graduates

Names **Sara Khan**Sara566@gmail.com
Designation MS Scholar

Abstract - *At the moment, Western Ontario University is in the process of carrying out a longitudinal study that will last for a total of seven years. The primary objective of this study is to compile data regarding the academic performance and overall satisfaction experienced by engineering students after they have graduated from the university's program. In addition, the purpose of this study is to investigate whether or whether the MBTI personality types of the individuals are connected to these aspects. According to the findings of a study that followed a group of students for seven years, the students who had the personality type I-TJ had a greater likelihood of experiencing academic success in their first year of school. This was the case even among students who had lower academic talents. Furthermore, when a comparable number of American students from various cultural backgrounds are compared to a cohort of Canadian acceptance students, it is evident that the former exhibit a higher level of intellectual prowess than the latter do. People whose personalities fall into the INTJ category are more likely to get a bachelor's degree, according to data collected during the first five years of the cohort's graduation. It is also abundantly obvious that I-TJs constitute a disproportionately large share of the population of people who go on to pursue degrees in engineering. There is also information offered regarding the various MBTI personality types and how they influence students' decisions regarding the subfield of engineering to study.*

Keywords: *Longitudinal Study, MBTI, Myers-Briggs Type Indicator, Academic Performance, Engineering Success, Canadian Graduates.*

How to Cite

Sara Khan. (2024). Longitudinal Study: MBTI, Academic Performance, and Engineering Success in Canadian Graduates. *Law Research Journal*, 2(1), 28–35. Retrieved from <https://lawresearchreview.com/index.php/Journal/article/view/26>

Introduction

At the moment, researchers at the University of Western Ontario (UWO) are looking into the question of whether or not the Myers-Briggs Type Indicator (MBTI) profile of a student has an effect on the engineering major that the student chooses, as well as

their

success in that engineering major. By enrolling a sample of former students of UWO who are now employed in professional engineering professions as participants planned extension of the study, the researchers hope to investigate whether or not there is a connection between personality type and job satisfaction as well as the job description.

The sample population for the MBTI test was comprised of individuals who had been admitted to the UWO School of Engineering throughout the course of a seven-year span. Every one of these students has finished the first year of the engineering program at UWO, which is a prerequisite for all of the other sub-disciplines that fall under the umbrella of engineering. In order to ease comparisons between different cultural contexts, this study looks at a group of Canadian students over a period of seven years and focuses on their MBTI profiles both at the beginning of their first-year program and after they have completed it. A comparison of the previously indicated profiles with the findings obtained from the same group of AASEE (American Society for Engineering Education) students [1] is presented below.

After finishing the introductory engineering curriculum, students at the University of Western Ontario (UWO) are expected to make a selection from among the following five possible engineering specializations: chemical engineering, civil engineering, electrical engineering, mechanical engineering, or materials engineering. Their whole educational experience, from the time they begin classes until the time they graduate, will be centered on the concentration they select. The fact that some of the students in this study's seven-year student cohort did not end up completing their degrees has an impact on the findings of this investigation.

The Myers-Briggs Type Indicator, also known as the MBTI, is a psychometric tool that was intended to examine an individual's psychological preferences. It does this by drawing from the conceptual framework that Carl Jung developed for the many types of personalities. The format that has been presented offers a methodical and applicable presentation of the personality preferences that have been revealed by the respondents. There is a connection between eight of these preferences and four different bipolar indices. There is no final or incorrect response to any of the eight preferences, which means that all of them have equal legitimacy. In contrast, the preferences of one type may, in comparison to those of other types, be more in line with the prerequisites of a particular circumstance.

Extraverts are those that have a tendency to engage with life in a holistic manner, take prompt action, and derive their energy from external sources such as other people and stimuli in the environment. Extraverts are denoted by the letter E. On the other hand, introverts (I) are characterized by a greater propensity for introspection and a preference for thoughts that arise from within their own internal world. There are two main categories of ways of perceiving the world: the sense (S), which places a premium on factual information, particulars, and the objective reality; and intuition (N), which is preoccupied with abstract concepts, implications, and potentialities. persons who have a preference for thinking (T) are more likely to base their decision-making processes on logical reasoning and analytical procedures, whereas persons who have a preference for feeling (F) are more likely to give more weight to societal and human considerations in their decision-making process. The judgment (J) attitude places a greater emphasis on organization and decision-making, whereas the perception (P) attitude is more attentive to developing trends and shifting opportunities. The fourth component relates to an individual's lifestyle attitude.

The Myers-Briggs Type Indicator (MBTI) is a personality test that categorizes people into one of sixteen distinct personality types based on how their four preferences interact with one another. ISTJ and ENFP are two examples of personality types that may be taken into consideration. The sixteen personality types that are determined by the Myers-Briggs Type Indicator (MBTI) are typically presented in the form of a 4 by 4 Type Table.

[2] The piece of software referred to as the Selection Ratio Type Table (SRTT) uses chi-square tests that are 2 X 2 to determine whether or not there are statistically significant differences between two separate groups. The Myers-Briggs Type Indicator (MBTI) tables of various different groups of people can be compared and contrasted with the help of this application.

Results

In the SRTT, experiments utilizing chi-square statistics were carried out, and the findings revealed that there were statistically significant differences between samples on each of the four bi-polar dimensions, cross-dimensional letter pairings (such as IJ, SF, and NP), and combinations of three and four letters. In order to make the following results easier to understand, we have expressed them as percentage distributions along each of the four primary dimensions. The text that is included with

the

diagram provides an explanation for any other significant differences between the paired measurements. The database maintained by the Center for the Application of Psychological Type (CAPT) [1] provides information regarding the percentage distributions for the full seven-year cohort of Canadian engineering students in comparison to a comparable group of American engineering students and a group of American general first-year university students. A comparison of American engineering students to the first-year CAPT population as a whole provides further data suggesting that people with introverted, intellectual, and judging personality characteristics are more likely to pursue engineering education.

According to the results of a cross-cultural study, engineering students in Canada exhibit much higher levels of innovation, flexibility, and creativity than their American counterparts do ($p < 0.001$). The results of a study that compared engineering students in the United States and Canada [3] revealed that the Canadian group had a much higher T score than the American group. Students in Canada stand out from students in the United States simply because they have higher levels of intelligence and perseverance than their American counterparts. Studies have shown that Canadian engineering students have higher intelligence and problem-solving skills in contrast to their classmates that study engineering in the United States. It's likely that the reported discrepancy is due to cultural differences rather than disparities between engineering degrees. If we look at students from the United States and Canada side by side, it's probable that the American students are more outgoing and decisive than their Canadian counterparts. Nevertheless, additional research is needed to verify this seemingly significant difference. In the bottom part of Table 1, we also display the passing-grade distribution of first-year engineering students in Canada. The passing grade distribution is defined as an overall average of 60%.

The proportion of persons in the successful group who have the I, T, and J preferences is noticeably larger than that of the people in the entering group. A study of both male and female students' academic accomplishments found that the link between excellent academic performance and personality types (namely I, T, and J) is more readily visible among male students (86%) than it is among female students (12%). Since there are more male students overall, there is a greater possibility that there would be discernible differences in their preferences; hence, additional study is required to confirm this gender imbalance. The academic performance of pupils

entering their first year is judged based on how well they did in grade 13. Students who scored 80 or higher on the admissions test are judged separately from those who scored 79 or lower, in addition to being judged separately from all of the other students. Regardless of the participants' personality types, those who consistently score 80% or higher are more likely to successfully complete the program. This holds true regardless of the participants' overall score. Those who had a score of 79% have a greater chance of being successful if they self-identify as having the I, IN, or IJ preferences ($p < 0.001$) or the T or TJ preferences ($p < 0.01$).

Therefore, it is possible to draw the conclusion that first-year engineering students from the cohort of students who are academically disadvantaged are more likely to succeed if their personality traits align with the INTJ type, whereas first-year engineering students from the cohort of students who are academically advanced tend to succeed regardless of their personality type.

On the other side, research has shown that students with ESFP preferences have a significantly greater likelihood of dropping out of school when compared to students in the lowest academic category.

It was discovered that female engineering students in Canada had considerably greater levels of EJ and FJ ($p < 0.001$), as well as J and SF ($p < 0.01$), compared to the male engineering students in the same program in the same country. Due to a bias that becomes apparent when comparing cohorts of admitted students to cohorts of students who successfully finish the first year, the percentage of female students who are successful in their first year of schooling is lower. On the other hand, the success rate of female students is 67.7%, while the success rate of male students is 65.1%. This indicates that female students perform equally as well as their male counterparts. It would appear that female students are not subject to any form of prejudice, at least not based on how well they have performed in the SRTT thus far. Based on this fact, it is possible to draw the conclusion that female students are smarter than their male counterparts. In order to establish the statistical dependability of these tendencies, a bigger number of students is required.

Researchers at UWO showed that the electrical and mechanical engineering subfields that students choose can be predicted based on personality qualities that are connected with academic performance and success in the first year of engineering.

Students who majored in traditional engineering were not significantly different from students who majored in other types of engineering, such as chemical or materials engineering.

Because of the hands-on, concrete nature of the discipline of civil engineering, students who have a strong predisposition for sensing (S) are more likely to pick a degree in civil engineering as their subject of study.

There was no statistically significant difference between the engineering concentrations that male and female students majoring in engineering decided to pursue.

In spite of this, there are a disproportionately large number of female students enrolling in chemical engineering programs.

Table 3 also includes a breakdown, by percentage, of the students who dropped out of the program during or after the second year, based on whether they did so voluntarily or involuntarily. In addition to having elevated amounts of N and P, these students also exhibited considerably elevated levels of both TP and NT. Students have a significant preference for the letters N and T, and this may be reflected in their expressed opinions of their own accomplishment in engineering programs. [Cause and effect] Students have a strong preference for the letters N and T. Students who have perception-oriented characteristics, such as an easygoing demeanor, a preference for divergent thinking, and a stronger preference for project exploration than project completion, have a difficult time succeeding in engineering programs, which require the timely completion of assignments, laboratory reports, and adherence to deadlines. These programs also require students to have a strong preference for project exploration over project completion. The only people in the study who exhibited significantly higher levels of personality traits connected to intuition (N) and perceiving (P) than the general population were those who had dropped out of the electrical engineering program.

According to the findings shown above, the existence of a greater number of individuals who have the E-FP personality type is associated with a lower degree of academic performance among students majoring in engineering. It is essential to have a diverse variety of personalities represented in the field of engineering. This is especially true of those who are able to think creatively, collaborate effectively with others, communicate clearly, and have a flair for recognizing the human element of

things in unexpected places. There have been a lot of suggestions made to make the field of engineering more accessible to persons who have EFP leanings. Examples of what these ideas encompass include group conversations, informal activities for problem-solving and creative discovery, group projects, and a mentorship program [5].

Summary:

It has been postulated that there is a significant cultural difference between students of engineering in North America and Europe. It is speculated that engineering students at UWO are more reserved and have a more optimistic attitude on life than their American colleagues.

The I-TJ personality type was much more common among engineering students who went on to thrive academically, both in their first year of college and as graduates, as compared to their less accomplished counterparts. This was the case both in their first year of college as well as after they graduated. People with an INTJ personality make up a sizeable minority of people who have acquired a bachelor's degree.

The majority of students who major in either mechanical or electrical engineering have one of three personality types: NT, INJ, or S. The findings of this research provide support to the hypothesis that students with exceptional talent, and in particular those with the INTJ personality type, are disproportionately represented in the academic disciplines of engineering and technology. According to the findings of the study, students who left their engineering programs at the completion of their second year exhibited significantly higher levels of perception (P). This research shows the importance of having a personality type that is more organized (J), which is particularly relevant given the rigorous nature of an engineering school.

Only a small percentage of engineering school students were able to successfully switch to another major and graduate with their original degree.



References:

- McCaulley, M.H., Macdaid, G. and Walsh, R., "MyersBriggs Indicator and Retention in Engineering", Int. Jnl of App. Engg. Ed., Vol.3, No.4, 1987, pp.99-106.
- McCaulley, M.H., "The Selection Ratio Type Table: A research strategy for comparing type distributions", Jnl of Psych. Type, Vol.10, 1985, pp.46-56.
- Rosati, P.A, "Psychological Type of Canadian Engineering Students", to be published, Jnl. of Psych. Type.
- Schurr, K.T. and Ruble, V.E., "The MBTI and first-year college achievement: a look beyond aptitude test results", Jnl. of Psych. Type, Vol.12, 1986, pp.25-37.
- McCaulley, M.H., "The MBTI and individual pathways in engineering design", Engg. Ed., Vol.80, No.5, 1990, pp537-542.