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INVESTIGATING AND SUPPORTING THE LEARNING STYLES OF FIRST YEAR STUDENTS OF INFORMATION TECHNOLOGY

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Abstract

This project seeks to give IT students an understanding of who they are in terms of their personality type, decision making style, group work strengths and weaknesses, learning style and career resonance.

We propose to use the Myers-Briggs Type Indicator (MBTI ®) to profile all first year IT undergraduate students. From this profile, we will be able to determine: a). the relative distribution of students according to MBTI ® type, and b). the implications of this type set in terms of dominant learning style.

The Myers-Briggs instrument has been selected because of its use in studying persistence to graduation, selection of major, and academic success in a variety of disciplines including medicine, engineering, dentistry and education. By the time of the conference, the type distribution of over 1000 first year IT students will have been determined, as well as the type distribution of their lecturers. Contributions of this study will be to determine any correlation of type to success and selection of major. Longer-term objectives include linking learning style to teaching style for IT subjects.

Introduction

The primary teaching and learning goal of my university is

> *To ensure that our graduates possess knowledge, professional competence, a sense of community responsibility, and a capacity to continue their professional and personal development throughout their lives.*

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We propose to use the Myers-Briggs Type Indicator (MBTI ®) to profile all first year undergraduate students. From this profile, we will be able to determine: a). the relative distribution of students according to MBTI ® type, and b). the implications of this type set in terms of dominant learning style.

We propose to debrief the student about: a). their type, b). the implication of their type in terms of career choices, c). the implication of their type in terms of group work, and d). the implication of their type in terms of learning style. Finally, we propose to track student choice of major according to type, and success in unit according to type.
The next section describes the background to the MBTI ®. This is followed by a section discussing the application of the MBTI® in revealing learning styles.

Background of the Myers-Briggs Type Indicator (MBTI®)

The Myers-Briggs Type Indicator (or MBTI ®) is a personality type indicator developed from the theories of personality proposed by C.G. Jung in 1920. The constructs of personality were seen by Jung to consist of preferences along three dichotomous scales: Extraversion – Introversion, Sensing- Intuition, and Thinking-Feeling. The latter two scales were proposed by Jung in the 1930s. The first scale (E-I) deals with how the person gains energy from the environment. For extraverts, the source of energy is from people, activities or external objects. For introverts, the source of energy is ideas formed within. The second scale (S-N) deals with how a person gathers information. A Sensing person gathers information methodically through the physical senses, while the Intuitive person gathers information holistically. The third scale (T-F) deals with how a person makes a decision, based on the information gathered. A Thinking person uses deductive logic based on objective and non-personified information. A Feeling person uses logic to make a decision, but factors into the decision cycle consideration for others values and beliefs.

Thus, a personality type can be expressed as a combination of the preference clarity for behaviours along each of the 4 dichotomous scales: E-I, S-N, T-F, and J-P. This yields 16 different personality types, shown in Table 1, together with the identified key characteristic (Martin 1997). The MBTI ® has been in research use since 1955, and in general management use since 1969. The latest form of the MBTI ® is Form M.

To read the table in some logical order, note that Extraverts occupy the lower 2 rows, while Introverts occupy the top two rows. Sensing Types occupy the left two columns, while Intuitive types occupy the right two columns. Thinking types occupy the outer columns while Feeling types occupy the inner columns. Finally, Judging types occupy the top two rows, while Feeling types occupy the inner rows.

Table 1. Brief Descriptors of MBTI ® Personality Types (From Martin 1997 pp. 16-47)

ISTJ Detail, precision, duty	**ISFJ** Quiet, warm, dependable, responsible	**INFJ** Vision, insight, creativity, harmony	**INTJ** Vision, insight, understanding
ISTP Logical, analytical, pragmatic	**ISFP** Gentle, caring, compassionate	**INFP** Deep feelings, quiet caring, harmony	**INTP** Logical, conceptual, analytical
ESTP Excitement, pragmatic, realistic	**ESFP** Realistic, spontaneous, impulsive	**ENFP** Enthusiastic, visionary, energetic	**ENTP** Energy, new, many, enthusiasm
ESTJ Active organizer, logical, facts, analytical	**ESFJ** Warm, concerned, caring, enthusiastic	**ENFJ** Warm, cooperation, ideals	**ENTJ** Driver, leader, planner

Over a number of years, the characteristics of each type were elucidated, the MBTI ® instrument was developed and refined. The MBTI ® has been applied in numerous settings leading to benchmark data and distribution statistics useful for counseling, career advice, management, team work, group dynamics, change management programs, improving communication skills, recognizing and managing stress team development, leadership development, organizational behaviour, conflict resolution, teaching styles, learning styles, academic success, academic persistence and correlational studies with other instruments of personality and achievement.

The next section summarises research findings on learning styles, academic performance and applications of the MBTI ® to higher education.

Learning Styles

There are distinct patterns of class involvement and theory engagement which are a function of the type dichotomies.

Examining the Extraversion-Introversion dichotomy, we see that extraverts require action and engagement with people. They may need long periods of activity throughout the learning period. For extraverts, lengthy lectures are a chore and tutorials that

emphasise individual effort difficult to endure. Conversely, introverts will not perform well 'on-the-spot' and need time for reflection and mastery. Thus, class questions and group work are difficult for these students. In addition, introverts need time Sensing types approach learning though fact retention and methodical study evolved as a serial experience (Beyler and Schmeck 1992 quoted in Myers et al (1999 pp 263). Intuitive types 'value abstraction and conceptualising' (Myers and McCauley quoted in Myers et al 1999 pp 263). Thus, sensing IT students will have difficulty with a top-down, theory driven approach, whereas Intuitive types will have difficulty with a bottom-up, fact oriented approach. The debate is on delivery, does one commence with concrete facts and examples as desired by Sensing types, or commence with the concepts and then presenting concrete facts and examples derived by the theory, as preferred by Intuitive types. Only through knowing type, will the lecturer have a means of determining the best approach for that group.

Students with a preference for the Thinking type of decision making also prefer a fact , serialized learning approach, whereas Feeling types prefer a holistic approach (Myers et al 1999 pp 263). In addition, there are gender differences for this dichotomy, with a majority of males reporting a preference for Thinking and a majority of females reporting a preference for feeling. Myers et al (1999 pp 264) suggest that Thinking types work best if approached from a systemic perspective and have a preference for independence in learning. Feeling types are more motivated if supported by caring learning facilitators.

Finally, in examining the Judging-Perceptive dichotomy, Myers et al (1999 pp 264) state that Judging types prefer learning settings with clear structure, motivation, drill and teaching games. Perceiving types like a holistic approach (Beyler and Schmeck 1992 quoted in Myers et al 1999 pp 264), tactile learning and collaborative work with dependency on others and the learning facilitator' (Elliott and Sapp 1988 quoted in Myers et al 1999 pp 264).

These results again emphasise a need to profile IT students MBTI® type, and from there, determine the preferred learning styles based on type theory. The inferred dominant learning styles then need to be validated with focus groups from each type. In addition, the types of 1st year lecturers should also be profiled and validated, in order to derive the innate and practiced teaching style.

We have already assessed the students using the VAK learning style model. This learning style model hypothesizes that people tend to use either a visual mode of learning (rendering learning objects into visual models), or an Auditory form (learning through lists and listening) or through doing (a kinesthetic mode). We developed a web survey form based on material used by other teaching institutions (Middlesex Community College, Don Clark's Learning Styles, White Horse Equine Ethology Project (WHEEP), and Callington Community College). We will seek to correlate the students' VAK orientation to MBTI ® type.

More importantly, students have reported through a reflective learning log, that the personal knowledge gained in completing the VAK assessment has already assisted them in improving their learning strategies. We seek to assist the students in developing more effective learning strategies based on the outcomes of the MBTI® study. We have trained several staff to be accredited MBTI® facilitators and we are thus able to effectively debrief the student on the meaning of their type. In addition, several staff are qualified teachers with significant consulting experience. We thus see extensions to this research program through counseling and working with the Teaching Support staff.

Research Hypothesis

These results lead to the following hypothesis regarding students in IT:

a. type is a predictor of performance in programming with INTJ being most successful because of the focus on logic, analysis, and attention to detail,
b. type is a predictor of performance in analysis with EN*J being most successful, because of the focus on interaction with people, analysis and decision making
c. type is a predictor of grade in technology units in IT with INTJ being most successful and ESFP being least successful, and
d. type is a predictor for persistence in IT studies with INTP, ISTP being most successful because of the resonance with detail and analysis.

In summary, we hypothesise that IT achievers will belong to the dominant intuitive types, as a result of their preferences and study habits. In addition, ITNJ students will achieve best in programming units, while ENTJ and ENFJ will achieve best in analysis and organizational studies units.

We also hypothesise that a significant percentage of 1st year students do not belong to this type set and will struggle with both the content and approaches taken by the academics. We suggest that many of our students will be Extraverted Sensing (ESTP,ESFP,ISFP and ISTP which comprise 25.3% in the representative sample).

We have targeted first year students for this study. Our population of students consists of about 40% international students aged between 22 and 27, 30% mature age students over the age of 25 and only 30% of 18 year old students. Type is theorized to be fixed by 18 and thus, we believe that the results will be valid. We have selected first year students because a). all first year students must do the compulsory unit, b). first year students then must make a choice on their major, c). the information gained by the first year student will assist them in making a choice, d). we can track the progress of the student through their studies at the university and e). the survey fits with the curriculum objectives of the subject.

We are now in a position to detail the proposed research program.

Research Plan

We have the following research agenda: a). profile first year IT students' type distribution according to the MBTI®, b). profile IT lecturers' type distribution according to the MBTI®, c). track student selection of major according to type, d). track student unit success according to type, and e). track student career selection and satisfaction with career according to type.

The timeline for this project is shown in table 2.

Table 2. Project Plan

Phase	Purpose	When
1.1	Profile lectures of IT	May 13 to May 17
1.2	Profile all students in the compulsory first year unit for each year from 2002 to 2004	May 16
2	Analysis to develop theoretical dominant learning styles and dominant teaching styles	Semester 2
3	Validation through observation and content analysis of selected units	2003
4	Track student success, persistence and major selection as a function of type	2003-2007

Conclusion

The literature review has show that type does influence: a). persistence in college, b) grades and c). approaches to learning.

From these results we hypothesis that type is a predictor of success in programming units and analysis units, with INTJ students being most successful in programming and EN*J students being most successful in analysis. In addition, we hypothesis that the least successful student will be ESTP.

This study will profile the Myer-Briggs personality type distribution for IT first year students. It will the correlate type to major selection, unit success and persistence to graduation with an IT qualification. Finally, it sets the scene for a detailed analysis of matching teaching style to IT student learning style through a careful content analysis of content, teaching process and teaching performance.

We will be able to present the distribution of personality types of 100 IT lecturers and about 1,000 first year students at the conference. We will also plus discuss preliminary results in terms of dominant learning styles of IT students.

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