

Matching Student Personality Types and Learning Preferences to Teaching Methodologies

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Abstract: The purpose of this study was to identify teaching styles that complement the learning preferences of undergraduate dental students while enhancing the quality of patient care. A formidable challenge to reform in dental education has been overcoming the resistance by faculty and administration to recommended changes. The organizational structure of dental institutions, with their independent departments, makes obtaining consensus on educational issues difficult. For beneficial change to occur, clear evidence of the benefits to all within the organization must be presented. The objectives of the study were to 1) identify the most common personality types among first- and second-year undergraduate dental students at the University of Texas Dental Branch at Houston using the Myers-Briggs Type Indicator (MBTI®); 2) identify the learning preferences of these personality types; and 3) determine a more effective approach to teaching clinical dentistry based upon student personality types and learning preferences. Four common personality types were identified among respondents: ISTJ, ESFJ, ESTJ, and ISFJ, with a predisposition for Sensing (S) (desire for facts, use of senses) over Intuition (N) (look for possibilities, relationships) and Judging (J) (prefers decisiveness, closure) over Perceiving (P) (desire flexibility, spontaneity). The most common occurring personality type, ISTJ, represents an Introverted, Sensing, Thinking, Judging individual. Specific clinical curricular techniques that would appeal to these common personality types are identified, and an explanation of their benefit is provided. Results of this study demonstrate the importance of faculty understanding and acknowledging different student personality types and related learning preferences as a way to initiate improvement of undergraduate dental education, promote student motivation, and allow for an expression of learning style preference.

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Much has been written about the past, present, and future of dental education. Beginning with the Gies Report in 1926, the basis for our modern dental curricula, and continuing with the AADS/Blauch Report (1935), the ADA Council on Dental Education (1940), the Hollinshead Survey of Dentists (1961), the *Report on Dental Education in the United States* (1976), the *ADA Future of Dentistry* report (1983), the Institute of Medicine report (IOM) *Dentistry at the Crossroads: Challenges and Change* (1995), and the Commission on Dental Accreditation Standards Revision (1996-98), implemented and recommended curricular changes have been presented and discussed. Several common themes that identify needed curricular reform related to both course content and manner of

presentation are interwoven within many of these reports. Examples of problems addressed in these reports include overcrowded curricula that do not allow for student reflection; outdated information representing the past rather than future; inadequate link with medicine; and an inability to prepare and stimulate students to be lifelong learners.

A few of these reports expressed concern about how information is presented to students during their undergraduate education. The 1995 IOM report called for a modernization of teaching and learning methods in dental education.¹ Subsequently, Tedesco reported that “the dental education community has responded to the winds of change with some growth and little change.”² A formidable challenge to reform in dental education has been the resistance by fac-

ulty and administrators to recommended changes.³ As in medical education, the organizational structure of dental institutions, with their independent departments/disciplines, makes obtaining consensus on educational issues difficult. For beneficial change to occur, clear evidence of the benefit to all within the organization must be tangible and perceived as achievable.

The IOM report also recommended a move to learning strategies that promote critical thinking and increased problem-solving capabilities within undergraduate dental curricula that would prepare students to be lifelong learners.¹ Perry proposed three major stages of intellectual development: dualism, multiplicity, and contextual relativism.⁴ Dualism alleges that there is a correct answer for every question. Individuals at this intellectual level equate good teaching with providing the correct answers. The presumption that there is more than one way to address a problem is characteristic of multiplicity. At this level, learning how to find solutions to problems is more important than the solutions themselves. The third stage of intellectual development and learning, contextual relativism, alleges that knowledge, meaning, and associated solutions are content dependent—that appropriate reasoning processes are linked to supporting evidence.

Advocates of the Perry model contend that students, when presented with educational tasks that correspond to their intellectual developmental level, will be able to perform better and obtain a greater level of satisfaction than students who are expected to perform above their level of intellectual development or conversely assigned tasks that are below their cognitive level and thus not stimulating. This could also explain why some students have difficulty in a particular course when treating a patient in a clinical setting under the supervision of certain faculty. According to Perry's theories, there could be a mismatch between the student's intellectual development status and the instructor's expectations. For example, an instructor may expect the student to be capable of comparing and contrasting various therapeutic options, a complex cognitive task consistent with Perry's "contextual relativism" state, but the typical junior dental student is more likely to rely on "dualistic" thinking, which is consistent with the novice stage of learning. As Perry and other investigators indicate, novice learners are "black and white" thinkers, are not comfortable with abstractions, and often do not have the experience to make discerning distinctions between options.⁴⁻⁸ To gain an ability to focus on abstractions,

a student should be taught to organize knowledge around core concepts or "big ideas" to guide thinking about their domains.⁵ As a student's intellectual development evolves, the learning process should become less structured, allowing for independent discovery and application of knowledge.^{5,6,8}

Not only is there a need to reevaluate the curricular content in dental education, but the manner in which it is presented, based upon student preference, is also a valid concern. Over the past several decades, educational researchers have reported on the implications of dental student personality types related to individual achievement and satisfaction. One of the instruments that has been used to determine personality type is the Myers-Briggs Type Indicator (MBTI®), which measures differences in how individuals prefer to use their perception and judgment.⁹

Based on the theory of psychological types by Carl Jung, the MBTI measures personality preferences defined by four dichotomous pairs of mental functions or attitudes. Irrational mental functions, Sensing (S) or Intuition (N), relate to how an individual perceives information, while rational mental functions, Thinking (T) or Feeling (F), provide insight into how one makes judgments or decisions based upon their perceptions. A Sensing person prefers to use one or more of his or her five senses in gathering facts or information, while Intuition types look for meaning or relationships in their observations. Thinking individuals are inclined to make logical, impersonal decisions, with Feeling types preferring to make a judgment based more on their personal values and their effect on others. The two opposite pairs of mental attitudes, Extraversion (E) or Introversion (I) and Judging (J) or Perceiving (P), represent how individuals prefer to orient or direct their time and energy and how one deals with the world around them, respectively. Personality results from a preference for and an interaction of these attitudes and functions. The various combinations of the four dichotomies result in sixteen possible personality types designated by letters representing each of the preferred mental attitudes and functions (Figure 1).⁹

Previous studies using the MBTI in the evaluation of undergraduate dental student personality types found that there was a relatively strong preference for Sensing and Thinking (ST) as well as Sensing and Feeling (SF) combinations in approximately two-thirds of student respondents.¹⁰⁻¹² All three studies reported ESTJ (Extraversion, Sensing, Thinking, and Judging) and ESFJ (Extraversion, Sensing, Feeling, and Judging) as the two most common person-

ISTJ Introversion Sensing Thinking Judging	ISFJ Introversion Sensing Feeling Judging	INFJ Introversion Intuitive Feeling Judging	INTJ Introversion Intuitive Thinking Judging
ISTP Introversion Sensing Thinking Perceiving	ISFP Introversion Sensing Feeling Perceiving	INFP Introversion Intuitive Feeling Perceiving	INTP Introversion Intuitive Thinking Perceiving
ESTP Extraversion Sensing Thinking Perceiving	ESFP Extraversion Sensing Feeling Perceiving	ENFP Extraversion Intuitive Feeling Perceiving	ENTP Extraversion Intuitive Thinking Perceiving
ESTJ Extraversion Sensing Thinking Judging	ESFJ Extraversion Sensing Feeling Judging	ENFJ Extraversion Intuitive Feeling Judging	ENTJ Extraversion Intuitive Thinking Judging

Figure 1. Myers-Briggs type table

ality types, differing slightly in the subsequent order of personality preference. Silberman et al.¹² and McDaniel et al.¹³ compared MBTI results for students at the beginning and end of their dental education and for the four undergraduate classes, respectively, and found that personality type remained fairly constant from matriculation to graduation. These findings support proponents of the MBTI who believe that a person's personality type does not change over time; rather, with the acquisition of new knowledge and skills, an increase in confidence leads to a more well-rounded, diverse individual.⁹

For educational purposes, personality type may be used to identify associated learning styles or preferences. This assumption is based on the results of numerous research studies reported by Lawrence that observed people, grouped by MBTI types, in learning situations to see how they chose to learn and found that MBTI types tend to distinctive learning style preferences that cannot be explained by other factors.¹⁴ This study attempted to identify the most common personality types among select classes of

undergraduate dental students; identify the learning preferences of these types; and determine a more effective approach to teaching clinical dentistry based on identified student personality types and learning preferences.

Methods

At the beginning of the 2003-04 academic year, sixty-three first- and sixty-one second-year dental students at the University of Texas Dental Branch at Houston were asked to participate in this study by taking the Myers-Briggs Type Indicator instrument. Participation was voluntary, and results were anonymous. In order to obtain truthful MBTI results, individuals taking this instrument were assured that their results would be kept confidential. Therefore, the information was gathered anonymously as it was not the initial intent of the investigators to present results for any demographic categories, but rather to gather information on the personality types and as-

sociated learning styles and teaching preferences of the two undergraduate classes as a whole. Our research project was reviewed and approved by the University of Texas Health Science Center at Houston Committee on the Protection of Human Subjects, approval number HSC-DB-03-014.

The Myers-Briggs Type Indicator, Form M, is a ninety-three-item, forced-choice instrument containing both word-pair and phrase questions. It is the most widely used personality instrument in the world whose results reflect innate psychological or mental dispositions. Internal consistency reliability based on split-half and coefficient alpha methods of a national sample range from 0.88 to 0.95.⁹

Surveys were completed online, and a report for each student's MBTI profile was generated. Results of all student surveys were reported as number of respondents and associated percentages for each of the sixteen personality types. Based on the most common personality types, preferred learning and teaching styles were identified for individual types and for paired attitude and function combinations.

For the four most common personality types, a literature review was performed. This review included 1) publications of Consulting Psychologists Press, of which the MBTI is a registered trademark, and 2) contributing authors associated with the Center for Application of Psychological Type, Inc. These sources, along with previously published articles of a similar nature, allowed the authors to identify effective and preferred learning and teaching styles of these students related to their clinical education.

Results

Of the 124 students in the first- and second-year classes, 101 completed the MBTI, resulting in a response rate of 82 percent. The distribution of the personality types for participating students is shown in Table 1. The most common personality type

was ISTJ, which represented slightly over one-fifth of all students. Individuals who exhibited this type preference focus their energy inward on ideas and concepts (I); prefer to gather information through facts and the use of their senses (S); make decisions and form opinions logically, somewhat impersonally (T); and in dealing with others, prefer organization, decisiveness, and closure (J). The second through fourth most common personality types were: ESFJ (12.9 percent), ESTJ (11.9 percent), and ISFJ (10.9 percent). These four personality types, while representing only one-fourth of the possible sixteen personality types, characterized almost 60 percent of the respondents in this sample of students. For each of these four personality types, both Sensing (S) and Judging (J) preferences were evident, with a relatively equal distribution of Extraversion-Introversion (E-I) and Thinking-Feeling (T-F).

Distributions of attitude and function preferences are presented in Table 2. Considering individual

Table 1. Myers-Briggs Type Indicator® dental student type table (N=101)

SENSING TYPES		INTUITIVE TYPES		
Thinking	Feeling	Feeling	Thinking	
ISTJ N=22 %=21.8	ISFJ N=11 %=10.9	INFJ N=0 %=0.0	INTJ N=3 %=3.0	JUDGING INTROVERTS
ISTP N=5 %=5.0	ISFP N=4 %=4.0	INFP N=6 %=5.9	INTP N=1 %=1.0	PERCEIVING INTROVERTS
ESTP N=5 %=5.0	ESFP N=8 %=7.9	ENFP N=7 %=6.9	ENTP N=2 %=2.0	PERCEIVING EXTRAVERTS
ESTJ N=12 %=11.9	ESFJ N=13 %=12.9	ENFJ N=1 %=1.0	ENTJ N=1 %=1.0	JUDGING EXTRAVERTS

Table 2. Individual and paired attitude and function preferences

Total N=101	N	Percent
E	49	48.5
I	52	51.5
S	80	79.2
N	21	20.8
T	51	50.5
F	50	49.5
J	63	62.4
P	38	37.6
IJ	36	35.6
IP	16	15.8
EP	22	21.8
EJ	27	26.7
ST	44	43.6
SF	36	35.6
NF	14	13.9
NT	7	6.9
SJ	58	57.4
SP	22	21.8
NP	16	15.8
NJ	5	5.0
TJ	38	37.6
TP	13	12.9
FP	25	24.8
FJ	25	24.9
IN	10	9.9
EN	11	10.0
IS	42	41.6
ES	38	37.6

and paired attitudes and functions for all students, preferences for Extraversion or Introversion and Thinking or Feeling were almost identical. Sensing was preferred over Feeling by a four-to-one ratio, while results showed a predilection for Judging over Perceiving by a three-to-two margin. Combinations of the mental functions of Sensing with Thinking (ST) and Sensing with Feeling (SF) accounted for almost 80 percent of the students. The combination of Intuition with Feeling (NF) was preferred twice as often as that of Intuition with Thinking (NT). One of the more conspicuous results of this survey may be the underrepresentation of Intuitive types in the first- and second-year classes, especially in combination with Thinking. The most frequently occurring personality type reported in other studies, which is characterized by a preference for Intuition (N), ENFP,

was representative of only seven of the 101 respondents. To protect student confidentiality, it was not feasible to analyze students' responses according to gender for the reasons previously described in the methods section.

Discussion

The results of this study found that the vast majority of first- and second-year dental students preferred Sensing (S) to Intuition (N) with an equal distribution of Thinking (T) and Feeling (F). Dental clinical curriculum and the practice of dentistry offer both a technical environment for the Sensing-Thinking (ST) types who use logical analysis in their everyday lives and a people-oriented setting for Sensing-Feeling (SF) types who are concerned with patient welfare. Therefore, it is not surprising that these students were drawn to dentistry.

Despite the fact that the results of this study are consistent with those of previous studies that explored the personality traits of dental students,^{10-12,15} one obvious difference involves the most common personality type. In the student population tested in this study, ISTJ was the most frequently occurring type, describing approximately one of every five first- and second-year dental students combined. In the previous studies described in the literature review, this personality type never ranked higher than fourth in order of occurrence. While the reason behind this marked difference is unknown, the fact that this study involved entry-level students of a completely different generation, including cultural, social, and educational factors, might have contributed to this disparity. Interestingly, when comparing this study to the estimated frequency of MBTI type of the United States population as a whole, the results are identical for the first through sixth personality types that were evident among this population of dental students.¹⁶

Individuals who are ISTJ types have an abiding sense of responsibility for what they feel must be done that is supported by their desire for and command of facts as well as their organizational abilities. They like structure, routine, and closure and do not work well in situations where rules constantly change. They see themselves as quiet, serious, and realistic, making decisions analytically, logically, and impersonally based on experience. ISTJs are usually more focused on their assigned tasks than to the opinion of others, presuming that they have similar be-

iefs and values. Their Judging (J) attitude results in their need to know what is expected of them and represents their preference not to spend time discovering it themselves. Sensing (S) types want a clear statement of what the instruction is about, followed by a visual or auditory example or demonstration providing first-hand concrete examples. They dislike being rushed and need to see the usefulness of assignments or tasks up front. ISTJ individuals prefer instruction that is well structured and logical, moving from concrete to abstract.

Individuals who have the second most frequent type, ESFJ, focus mainly on people and relationships. They want harmony in all aspects of their lives but not at the expense of doing what they believe is right and just. Like ISTJs, they are responsible and dependable, but differ in that their responsibility to the “group” is to do their part while contributing to its synergy, rather than merely delegating work. These people are warm and caring, valuing relationships at home and work. A preference for Sensing (S) directs their Feeling (F) function toward facts in a pragmatic, nurturing manner. ESFJs are energized by teachers who take personal interest in them and provide individual feedback, more of a coaching approach. They prefer instruction that allows them to use their senses or examples that permit them to recall experiences. These individuals dislike being forced to move too fast, preferring to have all the facts laid out for them. Their Feeling function drives them to want to find harmonious solutions to problems, taking into account the feelings and needs of others. Like other Sensing individuals, they prefer to move from concrete to abstract instruction.

Thinking dominates the lives of ESTJ types as they constantly strive to analyze and bring order to their world. They work hard to complete a task so that they can move on to another one. They may be described as energetic and forceful, preferring leadership roles. These individuals prefer concrete, logical, and orderly instruction and, similar to other Sensing-Judging (SJ) people, want to know what is expected of them, with time to appreciate its value through the use of sensory examples and/or experiences. Thinking (T) types prefer instruction that focuses on this value system of practicality, which they consider reality. Their preference for Extraversion (E) is expressed in their desire to lead and to use talking as a means of processing their thoughts and ideas. In their quest to complete a task (closure), they often overlook or refuse to fully examine other important and relevant facts and must be reminded to

consider other factors. Individuals with the fourth most common personality type in this study, ISFJ, also feel a responsibility to see that things are done, but their approach is based on how it will affect others. Even though these individuals are structured and practical, if new evidence is presented, they are amenable to change, especially if it expedites the accomplishment of a task and preserves harmony. ISFJs prefer to know expectations and to be provided with the information required. They rely mainly on their senses to learn and need to see the practical application of a task or assignment. ISFJ students care about pleasing their teachers and appreciate coaching and compliments in a learning format that allows time for mental processing. These individuals apply their values to problem solving, relying on others for analytical reasoning. Due to their preference for Introversion (I), they prefer learning in a quiet environment that allows them to assess the value of the information being presented.

It should be noted that a preference for Judging (J) was favored over Perceiving (P) by over 60 percent of the students and for each of the four most common personality types. Both findings are consistent with previous studies.¹⁰⁻¹² These individuals choose to use either their Thinking (T) or Feeling (F) function in a structured, organized, and decisive manner when dealing with others. Students showing a preference for Perceiving are most comfortable in flexible, spontaneous environments. They can never acquire enough information and are therefore reluctant to make quick decisions.

Sensing (S) and Intuition (N), one of the two mental function pairs, have more implications for learning than the other three dichotomies because they represent how information is perceived and knowledge is acquired. Sensing types prefer hands-on, factual information, wanting to know up front what will be expected of them. Because they gather information using their five senses, they are preoccupied with the present, often overlooking the implications of future possibilities. Decisions are based on sensory-rich experiences rather than through the introduction and interpretation of information in the form of words or symbols.¹⁶ Individuals who favor Sensing prefer memorization of data and forming opinions of its value based on its practical application. Intuitive types prefer a “big picture” introduction to information, choosing to work with patterns or interrelations as their method for perceiving. Unlike Sensing types, these individuals visualize and contemplate beyond their senses, considering what

is possible, including future events or occurrences.⁹ They come to conclusions through insight, preferring to “read between the lines” rather than relying on memory or an introduction to new, written information. Intuitive people often concentrate so heavily on new possibilities that they fail to see immediate, practical applications. Individuals favoring Intuition prefer learning about things through contemplation and discussion, following their imaginative and creative nature.

To a lesser degree, the two judgment functions, Thinking (T) and Feeling (F), are also important in learning in that they represent how one makes decisions based upon his or her perceptions (gathered information). Thinking individuals prefer to make decisions based on what is logical, looking for cause and effect relationships. Their decisions tend to be impersonal due to their exclusion of emotional distractions. Their method of arriving at a conclusion includes objectivity, impartiality, fairness, and telling the truth, even to the point of ignoring their own personal values and desires. Feeling types make decisions that take into consideration the opinions of those who will be affected. Their preference for decision making can be described as subjective, harmonious, tactful, and preserving values.

While this study incorporated approximately one-half of the undergraduate student population at the University of Texas Dental Branch at Houston, its results are not intended to imply that all other dental institutions are similar. We would recommend that faculty and administrators at other dental schools also investigate this important aspect of their clinical curriculum as a means to improve their undergraduate education program.

Recommendations

Our findings of students’ preference for Judging (J) over Perceiving (P) support those of McCaulley¹⁷ who found a significantly high number of health-related professionals, including dentists, were much more likely to be Judging versus Perceiving types. Although each person has a preference for one of the four mental attitude and function pairs identified by the MBTI, everyone uses all eight preferences every day. This is important to keep in mind when developing any curriculum, be it classroom or clinical. To maximize the clinical learning experience, faculty should present information and guidance in a manner that allows all students to use

or express their individual preferences to understand, appreciate, and apply new information or skills. For these desired outcomes to occur, the transfer of knowledge should be compatible with a student’s learning preference. Faculty can facilitate learning by using a variety of teaching/learning techniques. Based on the recommendations of Martin and Lawrence, the following are examples of teaching and learning strategies that would appeal to both Sensing (S) and Intuitive (N) types:^{16,18}

- within the context of facts of concepts (S), introduce abstracts or symbols (N);
- provide sensory-rich material (S) in a “big picture” context (N);
- afford students the choice of reading about (S) or observing something new through modeling or discussion (N);
- indicate the practical applications for a new skill or procedure (S), allowing time for imaginative reflection (N); and
- allow for completion of a procedure by following specific instructions (S) or by originality based on sound evidence (N).

For the reasoning functions of thinking (T) and feeling (F), effective clinical teaching techniques that could motivate students of both preferences are:

- present information in a logical, organized format (T) that incorporates the value to the patient (F);
- provide feedback that informs students what they did and did not accomplish (T) in a warm, appreciative manner that acknowledges their efforts (F); and
- allow students to self-evaluate the outcome of treatment based on cause and effect relationships (T) while appreciating the benefits to their patient (F).

While INTJ and INTP types represented only 4 percent of the first- and second-year dental students who participated (Table 1), findings consistent with those of Silberman et al., Erskine et al., and Silberman et al.,¹⁰⁻¹² their learning style preferences should also be addressed. They gather information (perceiving) utilizing their memory and past associations, see possibilities, and often have vivid imaginations.¹⁴ Although the number of these students per class is small, their personality types are often drawn to and stimulated by research and an academic setting.^{16,18,19} These students represent our profession’s future researchers and teachers, and as such should be nurtured during their undergraduate education. A four-year study by Westerman et al.²⁰ found that, among students who dropped out during their first year of dental school, 90 percent exhibited a prefer-

ence for Intuition (N) over Sensing (S). Whether these first-year students left due to the educational environment or realized that the profession of dentistry was probably not for them is unknown, but a partial explanation may include the belief of MBTI proponents that individuals prefer learning styles and teaching formats that allow for an expression of their individual preferences.

When possible, students should be offered multiple learning opportunities that promote motivation and allow for an expression of preference. Educating students on individual personality types would help them to better understand their own behavior, the behavior of others, and the most effective way to interact with others. Implications would include student/student, student/faculty, student/patient, and ultimately dentist/patient relationships. An appreciation for and application of type by both faculty and students would not only contribute to the effectiveness of any clinical curriculum, but should also produce a more competent, effective, and content practitioner.

While this article has focused on ways to provide undergraduate dental students the optimal clinical learning experience based upon preferred learning and teaching styles, the knowledge and skill to practice dentistry is but one piece of the puzzle. Students must be allowed to grow and mature as individuals during their predoctoral training so that they have the confidence to apply this acquired knowledge and skill judiciously to the care of their patients. Education is not just about the transmission of information, but should also include the transformation of the learner.²¹

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