



THE BEACON



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Myers-Briggs Type Indicator

Editor's Note

The Department of Educational Development has established ongoing assessment efforts to measure learning style (Myers-Briggs Type Indicator), critical thinking (California Critical Thinking Skills Test) and intellectual development (Scale of Intellectual Development). In this issue we present results from the MBTI. In upcoming issues we will present analyses from the critical thinking and intellectual development assessment efforts. We welcome comment and strongly encourage educational researchers within the health professions to use our data for research purposes.

Background

Learning style is best understood as the composite characteristic cognitive, affective, and physiological factors that serve as relatively stable indicators of how a learner perceives, interacts with, and responds to the learning environment. Learning style is a structure of neural organization and personality which both molds and is molded by human development and the learning experiences of home, school and society.¹

Studies have demonstrated a relationship between academic performance and students who were taught in their preferred learning style.² For example, Nelson et al., found that college students who were assessed on their learning styles, received an interpretation of their strengths and weaknesses, and were provided instructional sessions on applying these strengths and weaknesses, achieved significantly higher grade-point averages and higher retention rates than those students: (a) who were assessed on their learning styles and only received an interpretation of their strengths and weaknesses, and (b) those who received no learning style intervention.³

The instrument used to measure students' learning style was the Myers-Briggs Type Indicator (MBTI). The MBTI is a forced-choice, self-report personality inventory developed to measure variables in Carl Jung's theory of psychological type. The MBTI consists of 166 questions representing four underlying bipolar constructs: Extraversion-Introversion (E/I), Sensing-Intuition (S/N), Thinking-Feeling (T/F), and Judgment-Perception (J/P). The four constructs are combined into a 'profile' of which 16 possibilities exist. For example, a person can have a profile type of ESTJ. Research has established evidence of the MBTI validity and reliability.⁴

The bipolar constructs are defined as follows: Extroverts (E) tend to focus on the outer world of people and things while introverts (I) focus on the inner world of ideas and impressions. Sensors (S) focus on the present and on concrete information gained from senses while intuitives (N) focus on the future with an emphasis on patterns and possibilities. Thinkers (T) base their decisions on logic and objective analysis while feelers (F) base decisions primarily on values and subjective evaluations of person-centered concerns. Judgers (J) prefer a planned and organized approach to life while perceivers (P) enjoy a

REGARDING TABLET PCs

I recently had the opportunity to sit in a classroom and watch a professor use a tablet PC very effectively. I was excited about the possible applications but couldn't give a great answer to the first question I received when I returned to my office: "What makes a tablet PC better than a whiteboard or a Smartboard?" Fortunately, I came across a blog which gives a much better answer than I gave my colleague. The author of the blog, Jim Vanides of Hewlett-Packard, very graciously gave permission to copy his blog as long as I provided the link to it: www.hp.com/go/hied-blog. The site is well worth visiting for the comments by users of tablet PCs and also for Mr. Vanides's other postings.

Kathleen Hagen, Director of Faculty Development, HPD

11 Reasons Why a PC is Better

better than what? OK, the full title should have been "Eleven Reasons Why a Tablet PC + Digital Projector is Better Than a Whiteboard or Overhead Projector... and Sometimes Smarter Than a Smartboard". I'm still frequently asked what a Tablet PC can do. Once I explain that they do everything a laptop does PLUS you can draw in the screen, then the next obvious question becomes, "How does this help me in class?" Below are 11 reasons to consider a tablet pc, based on the experiences of our HP grant recipients...

While many of the examples I blog about are 1-to-1 settings where all the students and the teacher are interacting through their own tablet pc, there are many examples of what can be done with ONE tablet in a classroom. In fact, most of the original [HP Technology for Teaching grants](#) (2004-2008) supported teams of teachers, each with one tablet pc. I even heard the descriptor, "[The One Tablet Classroom](#)" first from Dr. Ricky Cox at Murray State, the site of another HP Technology for Teaching grant.

So why all the excitement about one tablet pc in a classroom?

Below is my list of 11 examples, gathered from the innovations and comments from HP grant recipients. These are not ideas - these are real examples from real classrooms where real differences in student learning are being reported.

Why a Tablet PC + Digital Projector is Better Than a Whiteboard or Overhead Projector

- **I don't need to erase to keep going** - With a whiteboard, when it fills up, out comes the eraser. If you're a student who is not a fast note taker, game over. Infinite digital space is so much nicer, because you don't interrupt the train of thought.
- **I can go BACKWARD and answer dangling questions** - This example came from a high school geometry teacher in Georgia who uses the infinite pad of digital "paper" in MS Journal to present from. She used to use an overhead projector with a somewhat infinite roll of acetate. She explained that because her presentation annotations were easily accessible, she had a student (for the first time ever)

ask her to go BACK 3 pages to where she was five minutes ago. Students don't stop thinking after you erase your whiteboard!

- **I can archive and share my presentation after class** - Many teachers report that they create a "master file" of their lesson plans, and present from a copy so they can annotate and save it for post-class distribution. This has an interesting effect of changing student note-taking - they start to shift from "transcribers" to "thinkers".
- **I can easily incorporate rich media into my classroom** - Why limit our teaching to words scrawled on a whiteboard? Back in the day, videos (or even farther back in the dark ages with movies and film strips!) were run on a separate system requiring more equipment, more hassle, and sometimes a "film monitor" (am I dating myself?). Today, with a tablet pc and an internet connection, we can bring video, audio, web-content, even live polling and videoconferencing with guest speakers, into our classrooms to support presentations - and more importantly - the discussions and questions that follow.
- **I can more easily overlay annotations on images** - This is nearly impossible on a whiteboard, and only possible-but-a-hassle on an overhead projector. Heaven forbid you should want to ERASE an annotation to make another point. What a mess!
- **I have a million colors at my fingertips** - not ON my fingertips. I don't miss the days of chalk (three colors, if you can find them) and erasable pens (a packet of 6 colors, if you were really hip) But there are more reasons to consider a Tablet PC. The following examples are specific to **why a Tablet PC + Digital Projector is smarter than a SmartBoard**:
- **I can make the image HUGE so everyone can see** - In one classroom I visited, the projector was in the back of the classroom and the image took up the entire cinderblock wall up front. Needless to say, all the students could see just fine. In fact, they seemed to be GLUED to the content.

- **I can face my students** - Teachers know that learning is social, and eye contact can tell you a LOT (and help you manage your classrooms). Besides, it's simply more friendly to have a face-to-face interaction with our students!

- **I can present from the BACK of the room so students focus more on the content** - This turns out to be an advantage for students, too. One student I spoke to, when asked what's different in his "one tablet classroom", said, "I like to come up and work the problems". I asked him why that was different than coming up to the whiteboard, and he said, "No one is looking at me!" This turns out to be extremely important for many students, and it was made possible because his teacher had the tablet in the back of the classroom.

- **I can take it home or on a field trip** - Who doesn't prepare lesson plans at home or at a local café? Plus, if your projector isn't mounted to the ceiling, you can bring your presentation system anywhere that learning is liable to be happening...

I can create video podcasts before (or during) class - A tablet pc and a Bluetooth microphone turn out to make a terrific podcast platform when combined with screencast software like Camtasia (see my [Tablet PC Tip #5](#)). I am particularly intrigued by the increasing interest in pre-recording presentations and assigning them as homework. This has two benefits: You never have to give that talk again (it's saved for posterity), and more importantly, you can use the time you save in class for more class discussion

I know that this is not a static list - there are many more great examples of tablet pc use. So if you've made the switch from overhead projector, whiteboard, or even SmartBoard to a Tablet PC, please post a comment and share your thoughts and experiences. I look forward to hearing from you...

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flexible and spontaneous approach to life.

In reference to the Introversion/Extroversion profile Myers and McCaulley demonstrated a consistent pattern of aptitude for introverts. They measured strong correlations between introversion and IQ (a traditional measure of intelligence)⁵. However, they note that extroverts are not less intelligent, but rather, that introverts perform better on tests that measure work important to academia.⁵ As should be noted most intelligence or aptitude tests do not measure practical or applied intelligence.

In reference to the sensing/intuition functions, Myers and McCaulley discovered that intuitives consistently scored higher than sensors on all aptitude tests. These disparate results may be a result of a need by sensors to grasp the concrete world.⁵ Sensors tend to perform better on objective measures while intuitives display a greater proclivity for theoretical constructs. For example, research indicates that sensors perform better in lecture-discussion formats.⁶ Furthermore, Myers notes that intuitives define intelligence as 'quickness of understanding' while sensors define intelligence as 'soundness of understanding'.⁷

Examining the thinking/feeling dimension reveals that in education, thinking preferences tend to perform better in math and science courses.⁸ For instance, O'Donnell discovered that medical students who are Feelers were less likely to pass the NBME exams and drop out at a greater rate.⁹ Myers, McCaulley, Quenk, and Hammer also found in their research that thinkers outscore feelers on mean grades.¹⁰ Research also argues that students who possess the minority learning style in the classroom tend to drop out at a higher rate.¹¹

Analysis

The MBTI was administered to osteopathic medicine, pharmacy dental medicine, optometry, physician



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Stan's Soap Box

THE GIFT OF LISTENING

There is evidence in the literature that teachers with the gift of listening get better student achievement.

So, what do the best teachers do?

1. They give their students time when they respond to teacher questions, and they allow enough time for students to complete their answers without interrupting.
2. They actually hear exactly what students are saying and remain silent.
3. They give the non-verbal impression (through body language and eye contact) that what a student is saying is really interesting and important.
4. They are alert and focused on what the student is saying and not concentrating on the next thing to do.
5. They often reward student answers with verbal praise.
6. They pay attention to student feelings and are able to feel with them. A simple teacher statement like "I understand" sends the right message.
7. They often follow student answers with more teacher questions.
8. They can see things from the student's point of view without being judgmental or giving criticism.
9. They rarely use "should" and "should not" statements.
10. They trust student judgment in making decisions, and they recognize students do not always need their advice.
11. They recognize that they cannot solve all student problems, and that students are capable of running their own lives.

assistant, physical therapy and occupation therapy students during the first semester of their first professional year. Explanations of the MBTI as well as an opportunity to ask questions are presented to students before the MBTI is administered. Participation is voluntary and the results are confidential. After students have completed the MBTI, results are scored and returned to them with explanations; again, class time is used to present the results. For this study, 12 years of data from osteopathic medicine students, 9 years of data from pharmacy students, 4 years of data from physician assistant students, 3 years of data from physical therapy and occupational therapy students, and 2 years of data for dental medicine and optometry students are used in the analysis.

For this analysis the MBTI was completed by 1,838 osteopathic

medicine, 912 pharmacy, 377 physical therapy, 452 physician assistant, 207 optometry students, 139 dental, and 70 occupational therapy students. The most frequently reported Type for students in the study follow:

the dominant profile for osteopathic medicine, physician assistant, and dental students was ESTJ--meaning they are practical, realistic, with a natural head for business or mechanics

the dominant profile for physical and occupational therapy students was ESFJ--meaning they are warm-hearted, talkative, whose main interest is in things that affect people's lives

the dominant profile for pharmacy students was ISTJ--meaning they are serious, thorough, logical, and realistic.

the dominant profile for optometry students was ISFJ -meaning they rely on facts to make judgments,

tend to be organized, and offer strong warmth and sympathy.

Application

It is important to say clearly that there is no value judgment about any of the functions. For example, it is neither better nor worse to be a thinking or feeling type. In certain situations or contexts, however, each function possesses various advantages and disadvantages. The key is in recognizing this fact. Students or practicing health professionals who are misplaced may find themselves suffering cognitive dissonance and trouble completing successfully completing the curriculum.

To help guide prospective students or counsel current students who are having a difficult time completing the curriculum, educators may find the MBTI helpful. In addition, this information can help enlighten health profession students about the differences in personality and how these differences may manifest themselves in the classroom. The challenge for teachers is to find effective ways to share technical information found in their content domains so that all students regardless of style can understand and apply that information. Unfortunately, teacher skills that can create a sense of excitement out of complex scientific subject matter are oftentimes unknown to many health professional

instructors. That is because skills that can create a sense of excitement out of complex scientific subject matter are not part of their own learning experiences. The notion that teaching is simply the transference of knowledge dictated by the discipline is erroneous.

Much of what is taught is not needed for the students' future real world use. So the initial steps are to re-examine content, identify what needs to be included in each program, determine what not to teach, and simplify complex concepts. For example, simplification is especially important for strong Sensing learners so they can focus on essential information. Given the expansion of scientific knowledge it is simply not possible for one human being to be familiar with all there is to know in a particular field.

We need to create a learning environment where many styles of learning can be accommodated. Teaching methodologies other than the standard sixty-minute lecture with slide show presentation need to be considered. Putting students into a teaching mode enhances their own learning. This can be accomplished by having students act as tutors for other students; having students teach certain areas to the class; having open inquiry discovery groups; and creating small research groups charged with

the responsibility of reading, interpreting, and presenting results of research that will grab other students' interest. Well presented current research findings can inspire the learners to get out of their mental boxes and discover new pathways. Other possibilities for different modalities include: dividing large classes at times into workable small groups with facilitators; grouping students using similar learning styles; computer assisted programs that are tailored to specific learning styles; problem-based case studies with practical applications (especially helpful for strong Sensors); and simulated program instruction.

Ultimately, restricting teaching presentations to one modality, no matter how good it might be, will not be successful for all students with their many different learning styles. Many get bored, lose focus, and become passive learners. Frequent changes of modality can help to avoid this outcome. The faculty are the only ones who can effect a significant change in the learning environment. Change can be risky and threatening to us all, but the positive possible outcomes make it worthwhile. What better outcome could there be than improvement of student learning?

**Look for the next issue
of the Beacon
in October, 2009!**

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