Student Learning Styles

A Discussion of Learning Theories’ Impact on Teaching &
Designing Curriculum to Promote Learning

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Medical Education Discussion Group
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Learning Theories and Learning Styles

- Personality affects Learning Style (Carl Jung)

- Learning is Experiential (David Kolb)

- Learner’s Performance Develops from Simple to Complex in 3 domains: (Benjamin Bloom)

- Individuals use Multiple Types of Intelligence to Learn (Howard Gardner)
## Learning Theories and Learning Styles

### Jungian Theory of Psychological Types (1921):

<table>
<thead>
<tr>
<th>2 Attitudes:</th>
<th>Introvert &amp; Extravert</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Functions of Personality:</td>
<td>Feeling, Thinking, Sensation, Intuition</td>
</tr>
<tr>
<td>8 personality types</td>
<td>(I-F, E-F, I-T, etc.)</td>
</tr>
</tbody>
</table>
• Jung Typology Test

• Myers-Briggs Type Indicator (1956)

I/E; S/N; T/F; P/J

(16 possible combos)
# Teacher/Student Preferences

<table>
<thead>
<tr>
<th></th>
<th>Faculty</th>
<th>Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extraverted</td>
<td>46%</td>
<td>70%</td>
</tr>
<tr>
<td>Introverted</td>
<td>54%</td>
<td>30%</td>
</tr>
<tr>
<td>Sensing</td>
<td>36%</td>
<td>70%</td>
</tr>
<tr>
<td>Intuitive</td>
<td>64%</td>
<td>30%</td>
</tr>
<tr>
<td>Thinking</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Feeling</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Judging</td>
<td>63%</td>
<td>45%</td>
</tr>
<tr>
<td>Perceiving</td>
<td>37%</td>
<td>55%</td>
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- Students tend to be extraverted (prefer interaction, group work)
- Students tend to be sensing (prefer concrete, practical applications, linear strategies)
- Slightly more faculty tend to be introverted (prefer structured assignments, direct control over classroom)
- Faculty tend to be intuitive (like to go beyond facts to concepts and interaction of concepts)


- Concrete Evidence (Feeling)
- Reflective Observation (Watching)
- Abstract Conceptualization (Thinking)
- Active Experimentation (Doing)
# Learning Theories and Learning Styles

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<tr>
<th>Type</th>
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<th>Characteristics</th>
<th>Main?</th>
<th>Instructor as...</th>
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<tbody>
<tr>
<td>Type I: Concrete-Reflective</td>
<td>The Diverger</td>
<td>Respond well to explanations of how learning material relates to their experience, interests, future careers (lecture with discussion)</td>
<td>Why?</td>
<td>Motivator</td>
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<tr>
<td>Type 2: Abstract-Reflective</td>
<td>The Assimilator</td>
<td>Respond to information presented in organized, logical fashion, benefit from time for reflection (lecture)</td>
<td>What?</td>
<td>Expert</td>
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<td>What?</td>
<td>Expert</td>
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<tr>
<td>Type 3: Abstract-Active</td>
<td>The Converger</td>
<td>Respond to opportunities to work actively on well-defined tasks, learn from trial &amp; error in environment safe to fail (workshop)</td>
<td>How?</td>
<td>Coach (guided practice and feedback)</td>
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<tr>
<td>Type 4: Concrete-Active</td>
<td>The Accomodator</td>
<td>Respond to opportunities to apply course material in new situations and solve real problems (problem-based learning)</td>
<td>What if?</td>
<td>Problem-based teacher (pose open-ended questions &amp; get out of the way; enter in to guide)</td>
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% of First Year Med Students by Type

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<th>Main?</th>
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<tr>
<td>Type 1: Concrete-Reflective</td>
<td>The Diverger (11%)</td>
<td>Respond well to explanations of how learning material relates to their experience, interests, future careers (lecture with discussion)</td>
<td>Why?</td>
<td>Motivator</td>
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<tr>
<td>Type 2: Abstract-Reflective</td>
<td>The Assimilator (54%)</td>
<td>Respond to information presented in organized, logical fashion, benefit from time for reflection (lecture)</td>
<td>What?</td>
<td>Expert</td>
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<td>Type 3: Abstract-Active</td>
<td>The Converger (26%)</td>
<td>Respond to opportunities to work actively on well-defined tasks, learn from trial &amp; error in environment safe to fail (workshop)</td>
<td>How?</td>
<td>Coach (guided practice and feedback)</td>
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<tr>
<td>Type 4: Concrete-Active</td>
<td>The Accomodator (9%)</td>
<td>Respond to opportunities to apply course material in new situations and solve real problems (problem-based learning)</td>
<td>What if?</td>
<td>Problem-based teacher (pose open-ended questions &amp; get out of the way; enter in to guide)</td>
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Bitran, et al., Medical Students Change in Learning Styles during the Undergraduate Program. CMEJ 2012, 3(2):e86–e97
Distribution of learning styles at years 1, 3 and 7 of the program

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• Learning Style Inventory
  (Kolb, avail. From McBer and Co, Boston)

• Learning Type Measure
  (About Learning Inc., Wauconda, Ill)
Learning Theories and Learning Styles

**Modality Theory**

- **Visual**: See it
- **Auditory**: Hear it
- **Kinesthetic**: Do it

Source: http://3.bp.blogspot.com/-oBBtqB894GE/URCmimSTUhI/AAAAAAAAAmc/HuKeg90bLwg/s1600/3.c.+VAK.jpeg
Using VARK as tool, researchers at Wayne State SOM (Detroit) found that first-year students preferred multiple modes of information presentation:

2: 24.5%
3: 32.1%
4: 43.4%)*

Other Theories

Bloom’s Taxonomy

**Cognitive**
- **(knowledge)**
  - Evaluate
  - Synthesize
  - Analyze
  - Apply
  - Understand
  - Recall

**Affective**
- **(attitude)**
  - Internalize
  - Organize value system
  - Value
  - Respond
  - Receive

**Psychomotor**
- **(skills)**
  - Imitation
  - Manipulation
  - Develop
  - Precision
  - Articulation
  - Naturalization

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Multiple Intelligence (Gardner):

- Individuals have unique blend of 7 types of intelligence that complement each other as people develop skills or solve problems:
  1. Linguistic
  2. Logical-mathematical
  3. Musical
  4. Bodily-kinesthetic
  5. Spatial
  6. Interpersonal
  7. Intrapersonal (self understanding)

- Multiple Intelligence Test: various versions online
Multiple Intelligence

“... the theory validates educators' everyday experience: students think and learn in many different ways. It also provides educators with a conceptual framework for organizing and reflecting on curriculum assessment and pedagogical practices. In turn, this reflection has led many educators to develop new approaches that might better meet the needs of the range of learners in their classrooms.” (Mindy L. Kornhaber)*
Small Groups

1. What implications does the fact that students come to us with differing learning styles/preferences have for the individual teacher, whom herself has preferences/familiarities guiding how she teaches? What implications does this fact have for pedagogy guiding an entire curriculum?

2. If it is true that our new curriculum (as well as changes in medical curricula nationally) encourages medical students to be more active learners sooner (i.e., thinkers/doers rather than thinkers/watchers), what implications does this have for pedagogy in the new curriculum?
Distribution of learning styles at years 1, 3 and 7 of the program

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Some Take Home Thoughts*

1. If instruction is heavily based on one style of learning over others, “mismatched” students may often feel uncomfortable while “matched” students may not develop critical skills aligned with other ways of learning.

2. Optimal teaching style provides a balance of matching and not matching dominant student preferences.

3. Designing a balanced approach does not necessarily require assessing students’ learning styles/preferences; it is enough to select attempt to balance styles when teaching.

4. Learning style assessments to develop a class/group profile can provide additional support in designing instruction, but should not be the central focus.

5. Understanding learning theories and styles can help guide decisions regarding the pedagogy for a new curriculum.