A Conflict of Styles
Learning vs. Teaching

Richard Vasques

Center for Computational Engineering Science

April 2013
Information vs. Knowledge: Why is a Teacher Needed?

1. Information vs. Knowledge: Why is a Teacher Needed?
2. Common Issues
3. Expectations & Stereotypes
4. How Do People Learn?
5. How Do You Teach?
6. Workshop Contents
Video: TEDx talk
http://www.youtube.com/watch?v=ziQlxBjnYDQ
Common Issues

1. Information vs. Knowledge: Why is a Teacher Needed?

2. Common Issues

3. Expectations & Stereotypes

4. How Do People Learn?

5. How Do You Teach?

6. Workshop Contents
Different styles

Mismatches exist between common learning styles of students and traditional teaching styles of engineering and other exact sciences professors and instructors. In consequence, students...

- become bored and inattentive in class
- do poorly on tests
- get discouraged about the courses, the curriculum, and themselves
- change to other curricula
- drop out of school
Different styles

Mismatches exist between common learning styles of students and traditional teaching styles of engineering and other exact sciences professors and instructors. In consequence, students...

- ... become bored and inattentive in class
- ... do poorly on tests
- ... get discouraged about the courses, the curriculum, and themselves
- ... change to other curricula
- ... drop out of school
Different styles

Instructors, confronted by low test grades, unresponsive or hostile classes, poor attendance and dropouts, know something is not working; they often...

Vasques  ●  MathCCES Teaching Workshop  ●  A Conflict of Styles
Instructors, confronted by low test grades, unresponsive or hostile classes, poor attendance and dropouts, know something is not working; they often...

- ... become overly critical of their students
- ... get discouraged about their teaching abilities
- ... become averse to the notion of teaching
- ... begin to wonder if they are in the right profession
Expectations & Stereotypes

1 Information vs. Knowledge: Why is a Teacher Needed?

2 Common Issues

3 Expectations & Stereotypes

4 How Do People Learn?

5 How Do You Teach?

6 Workshop Contents
The human being is nature’s “label maker”
The human being is nature’s “label maker”

Professors

What my parents think I do
What my friends think I do
What my students think I do

What my spouse thinks I do
What my colleagues think I do
What I actually do
The human being is nature’s “label maker”
The human being is nature’s “label maker”
We all have different expectations and perspectives!

Let us play the “Label Game”. In a piece of paper, describe with one adjective each of the following people:

a) A “Good” Student
b) A “Bad” Student
We all have different expectations and perspectives!

Let us play the “Label Game”. In a piece of paper, describe with one adjective each of the following people:

a) A “Good” Student
b) A “Bad” Student
c) A “Good” Teacher/Professor/Instructor
d) A “Bad” Teacher/Professor/Instructor
We all have different expectations and perspectives!

Let us play the “Label Game”. In a piece of paper, describe with one adjective each of the following people:

a) A “Good” Student
b) A “Bad” Student
c) A “Good” Teacher/Professor/Instructor
d) A “Bad” Teacher/Professor/Instructor
e) Yourself as a student
f) Yourself as a teacher/professor/instructor
We all tend to remember the extremes...
We all tend to remember the extremes...

OUR FINAL IS A GROUP PROJECT?

GUESS I'LL BE DOING ALL THE WORK MYSELF
We all tend to remember the extremes...

DOESN'T SAY A WORD ALL SEMESTER

EMAILS OUTRAGED OVER GRADE 20 MINUTES AFTER POSTING
We all tend to remember the extremes...

Teacher asks for 1pg lab report?

Better give her 8
We all tend to remember the extremes...

SAYS YOU ARE A TERRIBLE TEACHER

NEVER CAME TO CLASS
We all tend to remember the extremes...

NOT EVEN A CLASS OF 200 STUDENTS

CAN DISCOURAGE HER FROM ASKING A QUESTION EVERY 2 MINUTES
But what about these students?

GOES TO CLASS, USUALLY

DOES PRETTY WELL, GENERALLY
But what about these students?
But what about these students?
Even though it sounds obvious...

... it is sometimes hard to keep in mind simple facts, like:

- Your class is NOT a homogeneous group
- Each student is unique, with his/hers own set of weaknesses and abilities
- There will be students who will stand out in good or not-so-good ways, and you must be careful not to adapt your teaching behavior with only these students in mind
- Unexpected things will happen

Embracing these facts is crucial if you wish to make an impact and engage the students in your class.
Even though it sounds obvious…

… it is sometimes hard to keep in mind simple facts, like:

- Your class is **NOT** a homogeneous group
Even though it sounds obvious...

... it is sometimes hard to keep in mind simple facts, like:

- Your class is **NOT** a homogeneous group
- Each student is unique, with his/hers own set of weaknesses and abilities
Even though it sounds obvious...

... it is sometimes hard to keep in mind simple facts, like:

- Your class is **NOT** a homogeneous group
- Each student is unique, with his/hers own set of weaknesses and abilities
- There will be students who will stand out in good or not-so-good ways, and you must be careful not to adapt your teaching behavior with only these students in mind
Even though it sounds obvious...

... it is sometimes hard to keep in mind simple facts, like:

- Your class is **NOT** a homogeneous group
- Each student is unique, with his/hers own set of weaknesses and abilities
- There will be students who will stand out in good or not-so-good ways, and you must be careful not to adapt your teaching behavior with only these students in mind
- Unexpected things will happen
Even though it sounds obvious...

... it is sometimes hard to keep in mind simple facts, like:

- Your class is **NOT** a homogeneous group
- Each student is unique, with his/hers own set of weaknesses and abilities
- There will be students who will stand out in good or not-so-good ways, and you must be careful not to adapt your teaching behavior with only these students in mind
- Unexpected things will happen

Embracing these facts is crucial if you wish to make an impact and engage the students in your class.
How Do People Learn?

1. Information vs. Knowledge: Why is a Teacher Needed?

2. Common Issues

3. Expectations & Stereotypes

4. How Do People Learn?

5. How Do You Teach?

6. Workshop Contents
Learning styles

Learning styles are “characteristic cognitive, affective, and psychological behaviors that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment” ¹.

¹Keefe, 1979
²Felder & Brent, 2005
Learning styles

Learning styles are “characteristic cognitive, affective, and psychological behaviors that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment”\(^1\).

- Theories vs. Facts
- Abstractions vs. Observable Phenomena
- Active Learning vs. Introspection
- Visual vs. Verbal

\(^{1}\) Keefe, 1979
\(^{2}\) Felder & Brent, 2005
Learning styles

Learning styles are “characteristic cognitive, affective, and psychological behaviors that serve as relatively stable indicators of how learners perceive, interact with, and respond to the learning environment” ¹.

- Theories vs. Facts
- Abstractions vs. Observable Phenomena
- Active Learning vs. Introspection
- Visual vs. Verbal

“One learning style is neither preferable nor inferior to another, but is simply different.” ²

---

¹Keefe, 1979
²Felder & Brent, 2005
How do you pick the right one?

Answer:

You don't! There is no "right" here, because there is not such thing as the right learning style! Your aim should be to equip students with the skills associated with every learning style category, regardless of their personal preferences, since they will need all of those skills to function effectively as professionals.

Attention: that does not mean you should not acknowledge the differences!
How do you pick the right one?

Answer: You don’t!. There is no “right” here, because there is not such thing as the right learning style!
How do you pick the right one?

Answer: *You don’t!* There is no “right” here, because there is not such thing as the right learning style!

Your aim should be to equip students with the skills associated with every learning style category, regardless of their personal preferences, since they will need all of those skills to function effectively as professionals.
How do you pick the right one?

Answer: You don’t!. There is no “right” here, because there is not such thing as the right learning style!

Your aim should be to equip students with the skills associated with every learning style category, regardless of their personal preferences, since they will need all of those skills to function effectively as professionals.

Attention: that does not mean you should not acknowledge the differences!
Some ways of assessing learning styles

1) The Myers-Briggs Type Indicator (MBTI)\textsuperscript{345}

Strictly speaking, the MBTI assesses personality types, but MBTI profiles are known to have strong learning style implications. It identifies preferences in four scales

\textsuperscript{3}Lawrence, 1993
\textsuperscript{4}Pittenger, 1993
\textsuperscript{5}Felder, 1996
Some ways of assessing learning styles

1) The Myers-Briggs Type Indicator (MBTI)\textsuperscript{345}

Strictly speaking, the MBTI assesses personality types, but MBTI profiles are known to have strong learning style implications. It identifies preferences in four scales

- Extraverts vs. Introverts
- Sensors vs. Intuitors
- Thinkers vs. Feelers
- Judgers vs. Perceivers

\textsuperscript{3}Lawrence, 1993
\textsuperscript{4}Pittenger, 1993
\textsuperscript{5}Felder, 1996
Some ways of assessing learning styles

2) Kolb’s Experiential Learning Model\textsuperscript{6,7}

In Kolb’s model, learning preferences are classified in 4 types based on

\textsuperscript{6}Kolb, 1984
\textsuperscript{7}Stice, 1987
Some ways of assessing learning styles

2) Kolb’s Experiential Learning Model

In Kolb’s model, learning preferences are classified in 4 types based on

- Concrete Experience vs. Abstract Conceptualization (how they take information in)
- Active Experimentation vs. Reflective Observation (how they process information)

---

Kolb, 1984
Stice, 1987
Some ways of assessing learning styles

3) The Felder-Silverman Model\textsuperscript{89}

http://www.engr.ncsu.edu/learningstyles/ilsweb.html

This model focuses on the answers to four questions\textsuperscript{2}:

---

\textsuperscript{8} Felder & Silverman, 1988
\textsuperscript{9} Felder, 1993
\textsuperscript{2} Felder & Brent, 2005
Some ways of assessing learning styles

3) The Felder-Silverman Model
http://www.engr.ncsu.edu/learningstyles/ilsweb.html

This model focuses on the answers to four questions:
- What type of information does the student preferentially perceive: Sensory (sights, sounds, physical sensations) or Intuitive (memories, thoughts, insights)?

---

8 Felder & Silverman, 1988
9 Felder, 1993
2 Felder & Brent, 2005
Some ways of assessing learning styles

3) The Felder-Silverman Model

http://www.engr.ncsu.edu/learningstyles/ilsweb.html

This model focuses on the answers to four questions:

- What type of information does the student preferentially perceive: Sensory (sights, sounds, physical sensations) or Intuitive (memories, thoughts, insights)?
- What type of sensory information is most effectively perceived: Visual (pictures, diagrams, flow charts, demonstrations) or Verbal (written and spoken explanations)?

---

Felder & Silverman, 1988
Felder, 1993
Felder & Brent, 2005
Some ways of assessing learning styles

3) The Felder-Silverman Model

This model focuses on the answers to four questions:

- How does the student prefer to process information: Actively (through engagement in physical activity or discussion) or Reflectively (through introspection)?

---

8Felder & Silverman, 1988
9Felder, 1993
2Felder & Brent, 2005
Some ways of assessing learning styles

3) The Felder-Silverman Model

This model focuses on the answers to four questions:

- How does the student prefer to process information: Actively (through engagement in physical activity or discussion) or Reflectively (through introspection)?

- How does the student characteristically progress toward understanding: Sequentially (in a logical progression of incremental steps) or Globally (in large “big picture” jumps)?

---

8Felder & Silverman, 1988
9Felder, 1993
2Felder & Brent, 2005
### Learning Styles Results

Results for: Richard Vasques

<table>
<thead>
<tr>
<th></th>
<th>ACT</th>
<th>SEN</th>
<th>VIS</th>
<th>SEQ</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>11</td>
<td>11</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>11</td>
<td>11</td>
<td>11</td>
<td>11</td>
<td>11</td>
</tr>
</tbody>
</table>

*REF*<-- -->

*INT*<-- -->

*VRB*<-- -->

*GLO*<-- -->

- If your score on a scale is 1-3, you are fairly well balanced on the two dimensions of that scale.
- If your score on a scale is 5-7, you have a moderate preference for one dimension of the scale and will learn more easily in a teaching environment which favors that dimension.
- If your score on a scale is 9-11, you have a very strong preference for one dimension of the scale. You may have real difficulty learning in an environment which does not support that preference.
How Do You Teach?

1. Information vs. Knowledge: Why is a Teacher Needed?
2. Common Issues
3. Expectations & Stereotypes
4. How Do People Learn?
5. How Do You Teach?
6. Workshop Contents
Teaching styles

Keeping the Felder-Silverman model in mind, one can parallel learning and teaching styles in a similar way:

- What type of information is emphasized by the instructor: Concrete (factual), or Abstract (conceptual, theoretical)?
- What mode of presentation is stressed: Visual (pictures, diagrams, films, demonstrations), or Verbal (lectures, readings, discussions)?
- What mode of student participation is facilitated by the presentation: Active (students talk, move, reflect), or Passive (students watch and listen)?
- What type of perspective is provided on the information presented: Sequential (step-by-step progression), or Global (context and relevance)?

---

8Felder & Silverman, 1988
Teaching styles

Keeping the Felder-Silverman model in mind, one can parallel learning and teaching styles in a similar way\textsuperscript{8}:

- What type of information is emphasized by the instructor: \textbf{Concrete} (factual), or \textbf{Abstract} (conceptual, theoretical)?

\textsuperscript{8}Felder & Silverman, 1988
Teaching styles

Keeping the Felder-Silverman model in mind, one can parallel learning and teaching styles in a similar way:\(^8\):

- What type of information is emphasized by the instructor: **Concrete** (factual), or **Abstract** (conceptual, theoretical)?

- What mode of presentation is stressed: **Visual** (pictures, diagrams, films, demonstrations), or **Verbal** (lectures, readings, discussions)?

\(^8\)Felder & Silverman, 1988
Teaching styles

Keeping the Felder-Silverman model in mind, one can parallel learning and teaching styles in a similar way\(^8\):

- What type of information is emphasized by the instructor: \textit{Concrete} (factual), or \textit{Abstract} (conceptual, theoretical)?

- What mode of presentation is stressed: \textit{Visual} (pictures, diagrams, films, demonstrations), or \textit{Verbal} (lectures, readings, discussions)?

- What mode of student participation is facilitated by the presentation: \textit{Active} (students talk, move, reflect), or \textit{Passive} (students watch and listen)?

\(^8\)Felder & Silverman, 1988
Teaching styles

Keeping the Felder-Silverman model in mind, one can parallel learning and teaching styles in a similar way:\(^8\):

- What type of information is emphasized by the instructor: **Concrete** (factual), or **Abstract** (conceptual, theoretical)?
- What mode of presentation is stressed: **Visual** (pictures, diagrams, films, demonstrations), or **Verbal** (lectures, readings, discussions)?
- What mode of student participation is facilitated by the presentation: **Active** (students talk, move, reflect), or **Passive** (students watch and listen)?
- What type of perspective is provided on the information presented: **Sequential** (step-by-step progression *the trees*), or **Global** (context and relevance *the forest*)?

---

\(^8\)Felder & Silverman, 1988
### Relationships

<table>
<thead>
<tr>
<th>Learning Style</th>
<th>Teaching Style</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perception</td>
<td>Content</td>
</tr>
<tr>
<td>Sensory</td>
<td>Concrete</td>
</tr>
<tr>
<td>Intuitive</td>
<td>Abstract</td>
</tr>
<tr>
<td>Input</td>
<td>Presentation</td>
</tr>
<tr>
<td>Visual</td>
<td>Verbal</td>
</tr>
<tr>
<td>Verbal</td>
<td>Visual</td>
</tr>
<tr>
<td>Active</td>
<td>Active</td>
</tr>
<tr>
<td>Processing</td>
<td>Student Participation</td>
</tr>
<tr>
<td>Reflective</td>
<td>Passive</td>
</tr>
<tr>
<td>Understanding</td>
<td>Perspective</td>
</tr>
<tr>
<td>Sequential</td>
<td>Sequential</td>
</tr>
<tr>
<td>Global</td>
<td>Global</td>
</tr>
</tbody>
</table>
Workshop Contents

1. Information vs. Knowledge: Why is a Teacher Needed?

2. Common Issues

3. Expectations & Stereotypes

4. How Do People Learn?

5. How Do You Teach?

6. Workshop Contents
Throughout the remainder of this workshop, we will discuss and actively practice:

- First Day of Class: DOs and DON’Ts
- Effective Lesson Planning
- Teaching to Address Different Learning Styles
- Techniques of Active Learning
References


