Good teaching in the lecture mode: Dimensions, strategies & skills
Prof. Nira Hativa, Tel Aviv University
Outline

1. Why teach well?

2. What are the main teaching dimensions? (A model)

3. How do the main teaching dimensions promote students’ learning?

4. Are there disciplinary differences in preferences of the main teaching dimensions by students?

5. How do excellent teachers use the main teaching dimensions?
Why teach well?

- For your students
- For yourself
- For your school/department
Why teach well?

- For your students
Why teach well?

- For your students, so that they will:
  - learn better
  - be more content with their studies
  - become interested in the topics you teach
  - would like to continue studying in the same area
Good vs. poor teachers: Sources for learning--undergraduates
Good vs. poor teachers: Sources for learning--graduates

- Teacher in class
- Teacher outside class
- Course textbook
- Other textbooks
- Peer help

Comparison of ratings for good and poor teachers.
Positive effects of poor teachers

- Challenge of taking the course
- Promote ability to learn independently
- Promote self-confidence
- Promote ability to solve problems
- Promote interest to pursue further math

Undergraduates
- 17
- 32
- 9
- 6
- 7
- 3
- 2
- 5
- 6

Graduates
- 60
- 48
- 5
- 5
- 10
- 6
- 23
Negative effects of poor teachers

- Decreases positive attitudes
- Decreases success in tests/exams
- Increases anxiety
- Decreases motivation
- Decreases self-confidence
- No negative effects
Why teach well?

- For yourself
Why teach well?
Faculty motivation to invest in good teaching

![Bar chart showing reasons for teaching well]

- Internal satisfaction: 98%
- Students' personal: 95%
- Salary: 84%
- Tenure/promotion: 80%
- Publishing ratings: 60%
- Teaching awards: 57%
- Cash awards: 43%

Percent
Why teach well?

Benefits for yourself:
Boosting your ego:
Superb, charismatic, sympathetic, perfect, a “ten”, the best teacher we’ve had so far…
Why teach well?

- Benefits for yourself:
  Good teaching contributes to your promotion in academic degrees, in getting tenure
Why teach well?

- For your school/department
Why teach well?

For your School/Department:

Good teaching contributes to:
- Attracting students
- Good name in your institutions
- Inviting your School’s faculty to give service courses to other Schools/Departments
2. What are the main teaching dimensions, strategies & skills?

Why should we be interested in this issue?

In order to plan and deliver effective lessons that promote students’ learning and understanding
Abstract of my talk on clarity in teaching

In the next 4-5 minutes I’ll present the content of 1-2 lecture hours
Demonstration

Clarity in teaching means teaching in a way that enables students to understand. Research shows clarity to be a valid, distinct, and stable construct, unaffected by extraneous student or teacher variables. An evidence for the importance of clarity is the very high correlations between students’ ratings of their teachers on overall satisfaction from instruction and teacher clarity, as can be seen in this diagram: We see here very clearly that the correlation is the highest on clarity and this is true for all: math, physics, and engineering.

Simplification is a major strategy for achieving clarity in teaching. There are four strategies for achieving simplification: Teaching in two (or more) cycles, teaching in small steps, informing students about the main points of the logical sequence, explanations in a coherent manner. Other clarity behaviors are: avoiding “noise”, adapting teaching to the students in class, looking back and training students in applying the new material.
What was bad?
Hierarchical model of teaching behaviors: Main, intermediate, and low-level dimensions

(Hativa, To Improve the Academy, 2000)

Main Dimensions
Clarity,…

Intermediate-level Dimensions
Strategies: reducing “noise”, adapting to students

Low-Level Dimensions: Classroom Behaviors/Strategies
What are the main dimensions of teaching?
Studies to identify the main teaching dimensions

1st type of studies: On the basis of students’ ratings of their teachers on survey questionnaires. One of the most frequently used in the US is the form:

SEEQ: Students’ Educational Evaluation Questionnaire

<table>
<thead>
<tr>
<th>SEEQ Scales and Items (paraphrased)</th>
<th>SEEQ Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Lrn</td>
</tr>
<tr>
<td>Learning/Value</td>
<td></td>
</tr>
<tr>
<td>Course challenging &amp; stimulating</td>
<td>0.434</td>
</tr>
<tr>
<td>Learned something valuable</td>
<td>0.607</td>
</tr>
<tr>
<td>Increase subject interest</td>
<td>0.646</td>
</tr>
<tr>
<td>Learned &amp; understood subject matter</td>
<td>0.487</td>
</tr>
<tr>
<td>Overall Course Rating</td>
<td>0.410</td>
</tr>
<tr>
<td>Instructor Enthusiasm</td>
<td></td>
</tr>
<tr>
<td>Enthusiastic about teaching</td>
<td>0.095</td>
</tr>
<tr>
<td>Dynamic and energetic</td>
<td>0.064</td>
</tr>
<tr>
<td>Enhanced presentation with humor</td>
<td>0.089</td>
</tr>
<tr>
<td>Teaching style held your interest</td>
<td>0.137</td>
</tr>
<tr>
<td>Overall Instructor rating</td>
<td>0.172</td>
</tr>
<tr>
<td>Organization/Clarity</td>
<td></td>
</tr>
<tr>
<td>Lecturer explanations clear</td>
<td>0.146</td>
</tr>
<tr>
<td>Materials well explained &amp; prepared</td>
<td>0.069</td>
</tr>
<tr>
<td>Course objectives stated &amp; pursued</td>
<td>0.128</td>
</tr>
<tr>
<td>Lectures facilitated taking notes</td>
<td>0.031</td>
</tr>
<tr>
<td>Group Interaction</td>
<td></td>
</tr>
<tr>
<td>Encouraged class discussion</td>
<td>0.058</td>
</tr>
<tr>
<td>Students shared knowledge/ideas</td>
<td>0.066</td>
</tr>
<tr>
<td>Encouraged questions &amp; gave answers</td>
<td>0.059</td>
</tr>
<tr>
<td>Encouraged expression of ideas</td>
<td>0.045</td>
</tr>
<tr>
<td>Individual Rapport</td>
<td></td>
</tr>
<tr>
<td>Friendly towards individual students</td>
<td>0.051</td>
</tr>
<tr>
<td>Welcomed students seeking help/advice</td>
<td>0.042</td>
</tr>
<tr>
<td>Interested in individual students</td>
<td>0.086</td>
</tr>
<tr>
<td>Accessible to individual students</td>
<td>-0.014</td>
</tr>
</tbody>
</table>
These studies identified several clusters of variables that compose the main teaching behaviors.
2nd and 3rd types of studies: Studying outstanding teachers

Lowman (Mastering the techniques of teaching 1995, Characteristics of exemplary teachers, 1996)

Study 2: Content Analysis of observations and videotapes of classes of 30 outstanding college and university teachers, and of interviewing them

Study 3: Content analysis of 500 letters of reference (recommendations) submitted to committees to select the best teacher

The two types of studies identified several main teaching behaviors that contribute to the excellence of the teachers
4th type of studies: Indirect evaluation of teachers

(Young & Show, The Journal of Higher Education, 1999)

1000 students were asked each to reflect on the teaching of one of his/her teachers in the previous semester, and to rate that teacher on 25 teaching behaviors, and on the global item: “overall teaching performance”.

Regression analysis identified 8 of the 25 behaviors as providing 87% of the contribution to the global item. These 8 behaviors can be regarded as the main dimensions of teaching performance.
What are the main dimensions of teaching that come out from the four types of studies?

Results of all these studies converge to a single model of teaching dimensions, which may be sorted into two categories:

1. **Cognitive**: Effective communication of the material to the students, and
2. **Affective**: Interpersonal relationships—Positive interactions with the students
A model of Main Teaching Dimensions

Categories

- Affective: Classroom environment
  - Positive Interactions
  - Care, respect, support

- Cognitive: Effective communication
  - Organized
  - Clear
  - Interesting: Promoting concentration & attention
How do the main teaching dimensions contribute to learning?

Categories:

Affective: Classroom environment
- Positive Interactions
- Care, respect, support

Cognitive: Effective communication
- Organized
- Clear
- Interesting: Promoting concentration & attention
Control Mechanism: Processing information in working memory--between STM and LTM

- Selection
- Problem recognition
- Rehearsal
- Searching
- Identifying related knowledge
- Connecting

- Identifying relationships
- Organizing in schemas and frames
- Response selection
- Coding
- Etc…
What are students’ preferences of the main teaching dimensions?

Are there dimensions that are more important to students’ learning than others?
That are a necessary condition of good teaching?
Correlations between teacher overall performance and other items, Stanford Math Dept. 1981, n=53

<table>
<thead>
<tr>
<th>Teaching dimension/strategy</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clarity of presentation</td>
<td>0.98</td>
</tr>
<tr>
<td>Course satisfaction</td>
<td>0.97</td>
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<tr>
<td>Teacher preparation</td>
<td>0.96</td>
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<tr>
<td>Clarification of key themes</td>
<td>0.93</td>
</tr>
<tr>
<td>Course contribution</td>
<td>0.92</td>
</tr>
<tr>
<td>Clarity and progression of topics</td>
<td>0.90</td>
</tr>
<tr>
<td>Stimulation of thought and creativity</td>
<td>0.89</td>
</tr>
<tr>
<td>Instructor relationships with students</td>
<td>0.88</td>
</tr>
<tr>
<td>Teacher interest in subject matter</td>
<td>0.83</td>
</tr>
<tr>
<td>Student interest in subject matter</td>
<td>0.83</td>
</tr>
</tbody>
</table>
Correlations between teacher overall performance and other items, Stanford Physics Dept. 1994-5, n=53

<table>
<thead>
<tr>
<th>Teaching dimension/strategy</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clarity of presentation</td>
<td>0.82</td>
</tr>
<tr>
<td>Interesting presentation</td>
<td>0.82</td>
</tr>
<tr>
<td>Intellectual challenge</td>
<td>0.75</td>
</tr>
<tr>
<td>Attitudes towards students and questions</td>
<td>0.71</td>
</tr>
</tbody>
</table>
Correlations between teacher overall performance and main dimensions, TAU, 1996
Clarity in teaching means teaching in a way that enables students to understand. Research shows clarity to be a valid, distinct, and stable construct, unaffected by extraneous student or teacher variables. An evidence for the importance of clarity is the very high correlations between students’ ratings of their teachers on overall satisfaction from instruction and teacher clarity, as can be seen in this diagram: We see here very clearly that the correlation is the highest on clarity and this is true for all: math, physics, and engineering.
Integration of studies on effective teacher behaviors at the school level: Rosenshine & Furst, 1971

50 studies of correlations between teacher classroom behavior and student achievement.

Findings: Teacher behavior which yielded the strongest relationships with student achievement was clarity.
Integration of studies on effective teacher behaviors at the higher-education level: Feldman, 1989

Examined 22 instructional dimensions for four indicators of importance:
1. Correlations with student achievement
2. Correlation with overall evaluation of the instructor
3. Statement of importance by faculty
4. Statement of importance by students

Findings: Clarity and understandableness showed to have the highest importance level regarding all four indicators (the 2nd was--teacher preparedness and organization)
Are there disciplinary differences in students’ preferences of the main teaching dimensions?
Are there disciplinary differences in students’ preferences of the main teaching dimensions?

Feldman, Research in Higher Education, 1976

In mathematics, physical sciences, engineering, and mathematics-based domains:
1st place: Clarity (with organization)
2nd place: Interesting presentation—maintaining concentration & attention

In humanities, education, arts, social studies:
1st place: Intellectual challenge, interesting presentation
2nd place: Clarity
How do excellent teachers use the main teaching dimensions?
How do excellent teachers use the main teaching dimensions?

Summary of research findings

There is no single way to achieve excellence in teaching.

It is necessary to excel in a few (at least two) of the main dimensions of teaching, to be at least “good” on clarity and to be OK on the others.