Teaching the Difficult through "Decoding the Disciplines"

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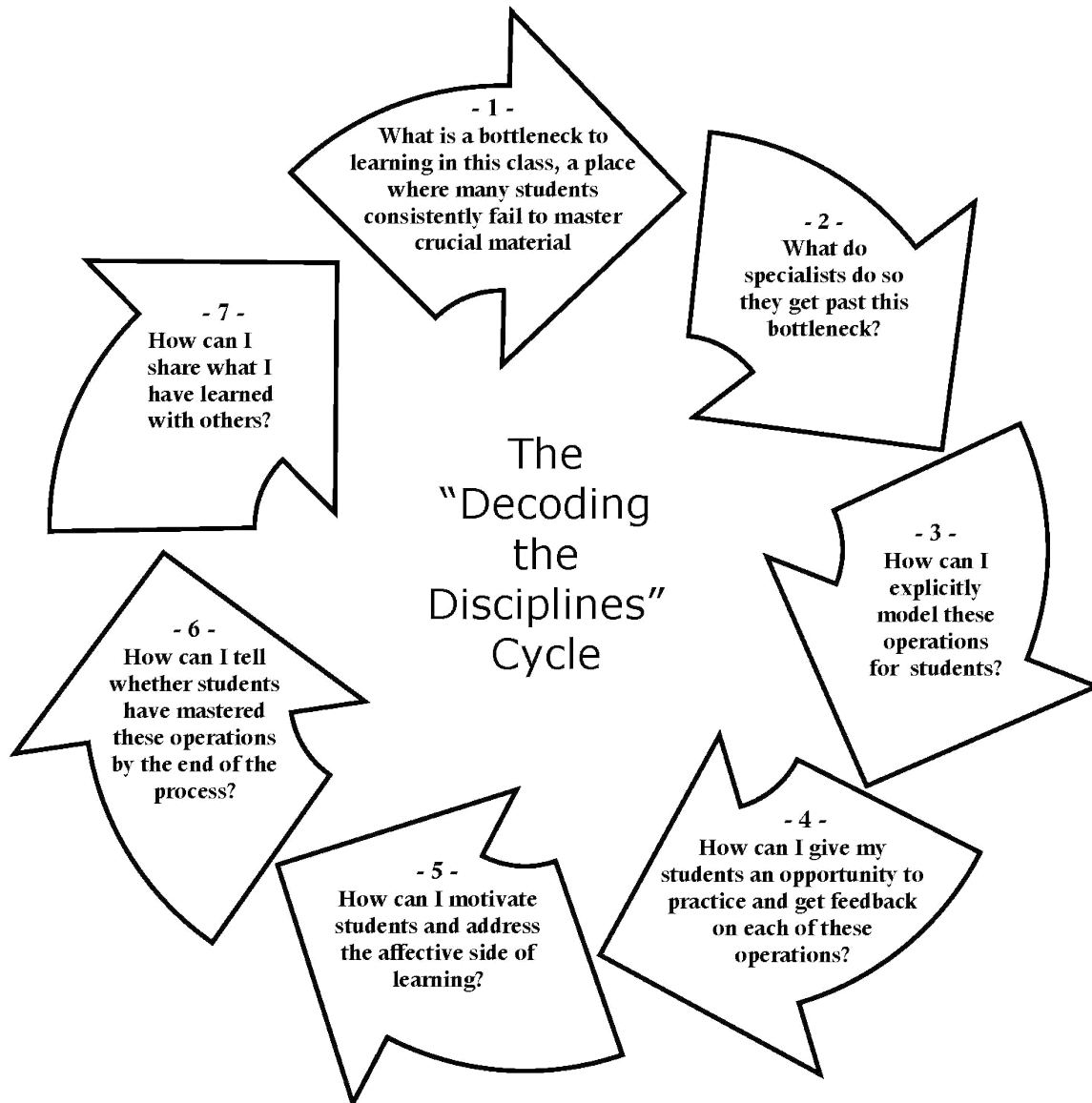
The "Decoding the Disciplines" Cycle

- 1 -
What is a bottleneck to learning in this class, a place where many students consistently fail to master crucial material

- 2 -
What do specialists do so they get past this bottleneck?

- 3 -
How can I explicitly model these operations for students?

- 4 -
How can I give my students an opportunity to practice and get feedback on each of these operations?

- 5 -
How can I motivate students and address the affective side of learning?

- 6 -
How can I tell whether students have mastered these operations by the end of the process?

- 7 -
How can I share what I have learned with others?

Handout 2

   Step 1: What's your bottleneck?

1) Identify a specific moment in your course in which your students face a learning
       bottleneck (i.e. something that is essential for their success but which semester
       after semester large numbers of students fail to grasp).

2) Describe as precisely as you can what they are getting wrong. (What is the nature of
       the bottleneck?)

Here are examples of productive and unproductive ways to approach the assignment:

1. English
Vague: Students cannot interpret texts.
Useful: "Students in literature classes have a particular problem in the basic approach to
textual interpretation. Students forever want to go directly to interpreting a text without
first getting a good grasp of a text's content. They need to observe before they interpret,
but they are constantly skipping a thoughtful observation stage. Skipping this stage leads
to poor interpretations." (*This observation is specific enough and provides enough
information that it can serve as a starting place for the analysis of the bottleneck.*)
                                                                      -Gutjahr, 2004

2. Biology
 Vague: Students have difficulty moving from fact learning to a deeper understanding of
biological processes
  Useful: Students have difficulty visualizing chromosomes, appreciating the distinction
between similar and identical chromosomes (i.e., homologs and sister chromatids), and
predicting their segregation patterns during mitosis and meiosis.
                                                                      -Strome, 2004

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Handout 3

Step 2: Novices Interview Experts

- Ask the expert: "How would YOU do that kind of thinking?"

- Ask yourself, "What kind of thinking is this in Bloom's taxonomy?" Then summarize the thinking back to expert at an abstract level.

- Probe at the place the expert cannot explain.

- Reassure the expert.

- Do NOT let expert describe how they teach it or start to lecture on the content.

Handout 4: An Example of an Opportunity for Student Practice in History

What Questions and Goals Should Be the Focus My Work for the Week?

Questions:

- In what ways did secular notions of progress take the place of the notion of an Apocalypse?
- What historical factors encouraged this change?
- What assumptions about human beings, the world, etc. underlay Condorcet's vision of the future?
- In what ways did mental patterns from Apocalyptic thinking carry over into ideas about progress?

Joseph Wright of Derby, *An Experiment on a Bird in an Air Pump* (Exhibited 1768)

This painting is an example of the popular interest in science during the Enlightenment

Goals:

- Learn to use primary sources to understand how peoples in a different era viewed their world.
- Learn to make explicit the assumptions that underlie historical texts.

What Readings are Available to Help Me?

What Materials are Available on the Web?

What We Will Be Doing in Class that Could Be Helpful in Answering the Questions for the Week?

What Assignment Must I Complete This Week?

1. Imagine that you were going to write an essay comparing the vision of the human situation in Sir Francis Bacon's *Novum Organum* with that implicit in the Apocalytic beliefs that we have been studying.

   A. Enter a brief passage from the selections by Bacon in the reader that is a good example of the ways in which his views diverge from those captured in the Apocalyptic tradition.

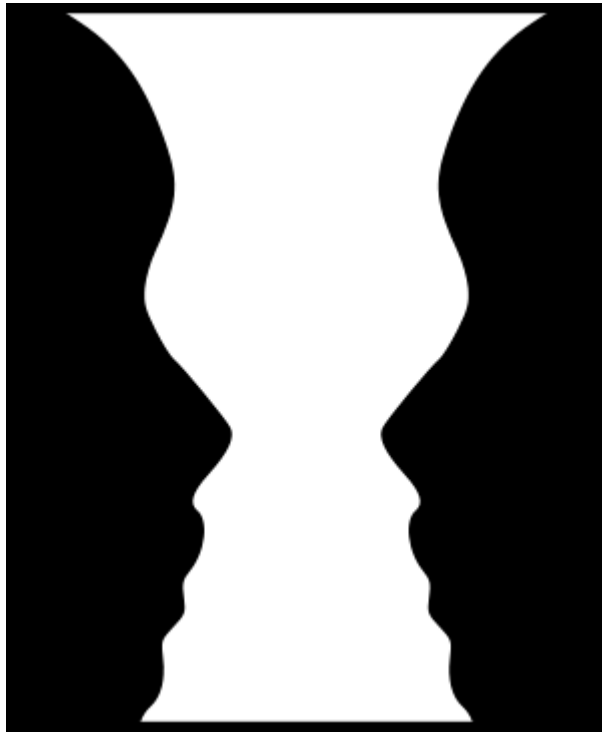   B. Briefly explain how this passage demonstrates these differences.

2. Imagine that you were writing an essay contrasting Ovid's view of human fate with that of Edward Gibbon. Find a passage from the selections from *The Decline and Fall of the Roman Empire* in the reader that would be a good example of this difference.

   A. Enter the quotation

   B. Briefly explain how this quotation would serve to demonstrate the differences between Gibbon's view that of the human condition and those of Ovid.

3. Summarize in a few words what Condorcet thinks the future is going to be like.

Handout 5: Gestalt Images to Model Switching Viewpoints

Prezi Presentation for Practice at Switching Viewpoints

Creature Comfors   Economic Productivity

Protecting the Weak   Aquinas   Virtue

Population increase   The Afterlife

Double click anywhere & add an idea

Creature Comforts   Economic Productivity

Protecting the Weak   Mandeville   Virtue

Population increase   The Afterlife

Handout 6: Step 6 Evidence of students learning of Switching Viewpoints

Examples of Responses to Question on Week 14 Assignment
>(In the box below describe a way of analyzing historical sources that you have learned in this course (i.e. what might you do in writing this paper that you would not have thought to do when the course began?)

- Student 1: "I have learned to identify the values and assumptions of writers, which has been incredibly helpful in understanding the reasoning of thinkers and being able to understand their positions from a historian's point of view even if I personally do not agree with them"
- Student 2: "I think the main technique that I have started to work on is finding the thought processes that go into a piece of writing. I've really started to look for the values, foregrounding, and assumption that we talked about in class."
- Student 3: "recognizing the different components of an argument. rather than a sweeping statement of summary of something breaking down the assumptions and values at the heart of that argument."
- Student 4: Considering what is foregrounded. And asking myself why do they think that? Then I try to reconstruct the world that would have made that particular thought make sense. It's kind of like a search for a motive in a detective case… Reconstruction of their world helps me to find a motive for why people think that way."

Selected student comments from the taped interviews:
- Student 5: "Over the whole course of the semester, we talked about … how underlying values and assumptions influence what people think, and how, in a history course – or just in life, really – you need to delve into those assumptions and values to really understand what people are saying. Because if you just take it at face value, then you don't really know what they mean, and you don't know why they mean it."
- Student 6: "By being able to, like, look at the values and assumptions, that really helped. Because I never thought of that before – and I am a history major, so you'd think it would have been possibly touched in previous courses, but – um…Because I was able to see their worldview, maybe, like what they felt about the world, because it's completely different than what I see, my perspective on things, so by looking at their stuff, their, their values and assumptions, it can…in comparing them to mine, I can see why they felt that way, or why they wrote what they did, why they felt what they did. And, I mean, all of it together, the online assignments where we had to deal with values and assumptions, and take people's arguments apart piece by piece, um, helped out a lot."
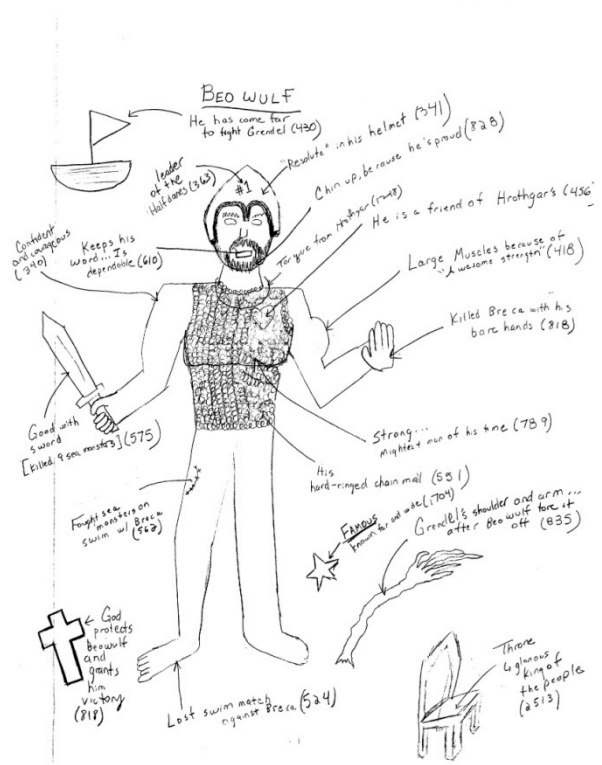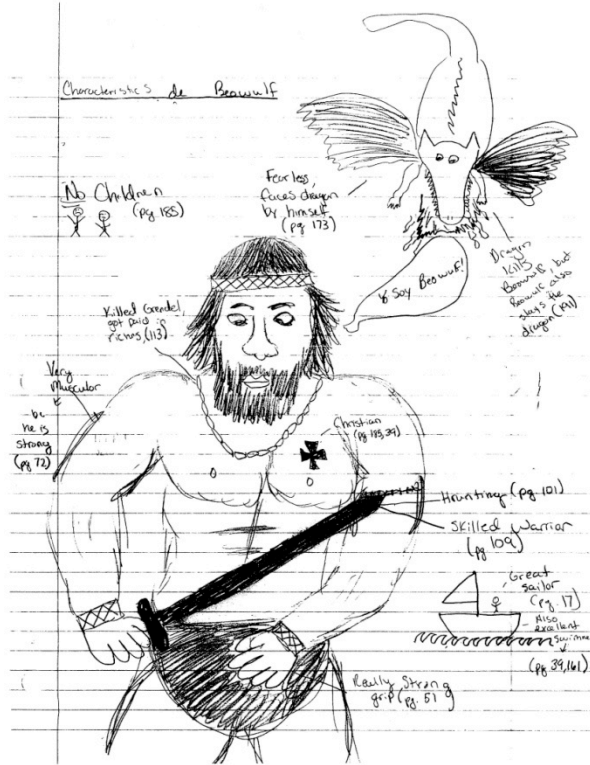
Handout 7

Visual Assessment of Prior Narratives (Affective Learning Project Materials)

Using arrows, dots, etc., draw how Mexican Immigration looks like historically.
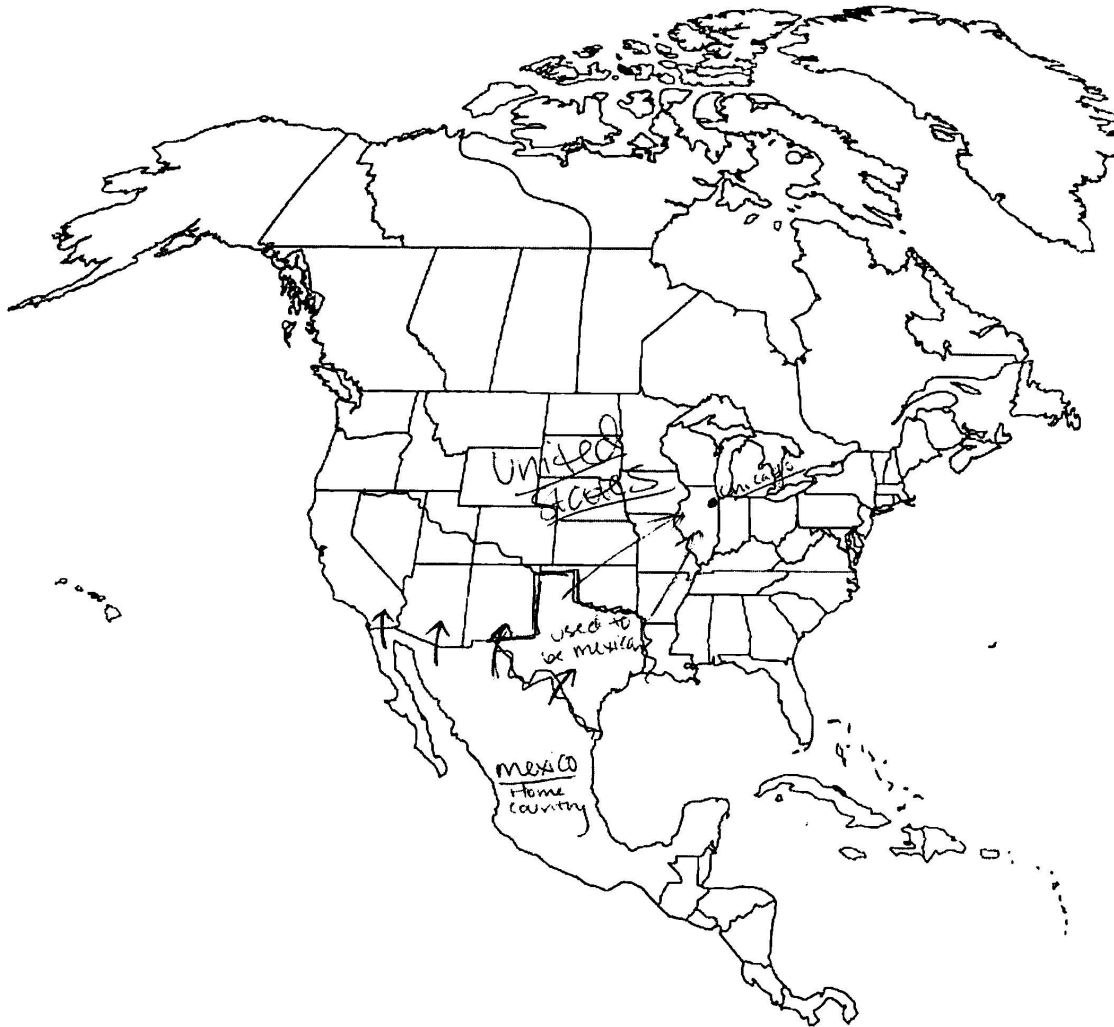
Handout 8: History Visual Assessment of Primary Sources

Student examples:

Summary of Assessment Outcomes:
- Many students worked with first half of text only (points to reading issues)
- Average number of items was 12
- 4 items (roughly) related to plot elements
- 2 items related to physical prowess (a generic quality)
- 1 item dealt with role (not enough to capture distinctive features of Anglo-Saxon society)
- 2 with character (not enough to capture distinctive features of Anglo-Saxon society)
- Students need to be pointed toward illustrating points that are specific to Anglo-Saxon society and particularly to social relationships and the character traits that are prized.

Handout 9: Questions to Get at Student Preconceptions

1. Besides hard work, what will it take to do well in this course?

2. What happened during X (the Middle Ages)?

3. What have you heard about X? (global warming, calculus)

Always add Part II: "Why do you say that?"

Results:

Affective Survey Question Spring 2011 n= 578 students

1) Some students are uncomfortable with the way U.S. sources depicted Spain, while others disagreed with sources that criticized the United States. No one comes off well in all the sources. Which of the student reactions most closely matches your own response?
  _ Student A: "I'll say what the professor has been saying about them."
  _ Student B: "I'll give both sides of the story to be objective."
  _ Student C: "I won't use offensive materials to be responsible."
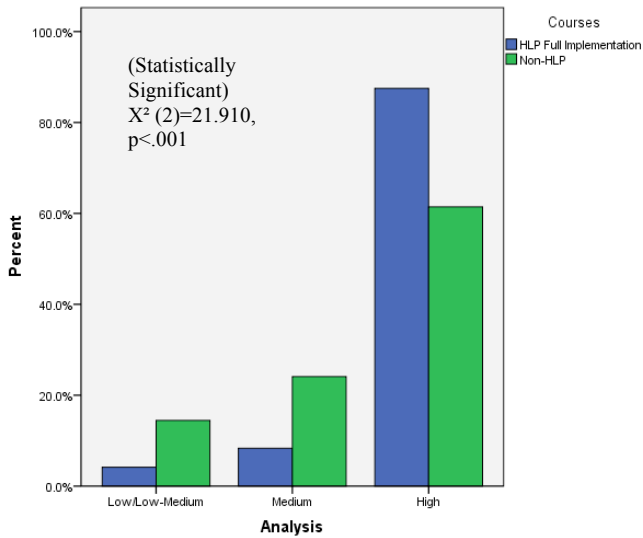 _ Student D: "I'll try to figure out why they say what they do."

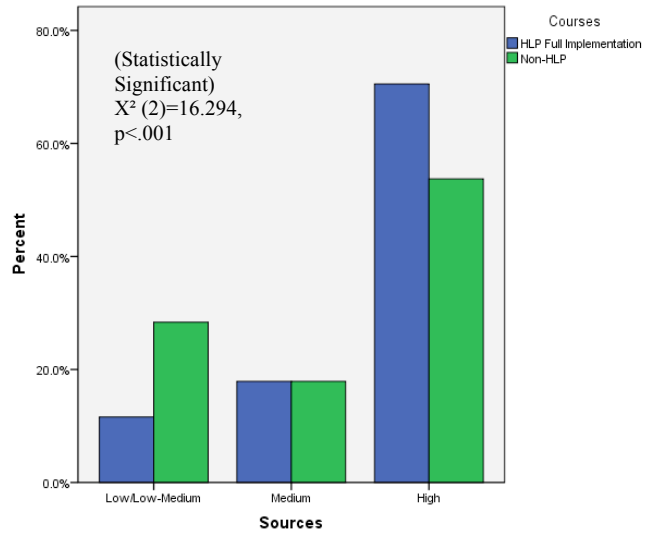**Handout 10**

Student Performance on HLP Spring 2011 Skills Survey

### Level of Thought in Students' Answers to the Survey Question on Analysis

(Statistically Significant)
$X^2 (2)=21.910$, $p<.001$

Level of Thought in Students' Answer to the Survey Question on Use of Sources

(Statistically Significant)
$X^2 (2)=16.294$, $p<.001$

Level of Thought in Students' Answer to the Survey Question on Argument

(Statistically Significant)
$X^2 (2)=16.294$, $p<001$
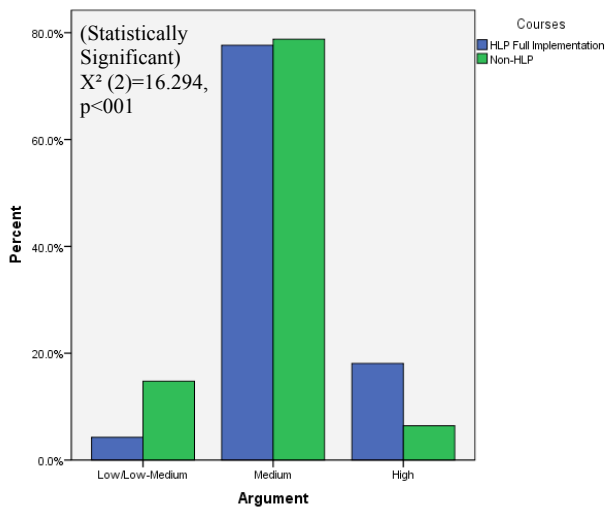
Measure of Students' Ability to Negotiate Affect in their Response to the Survey Question on Upsetting Material

(Statistically Significant)
$X^2 (2)=26.360$, $p<.001$
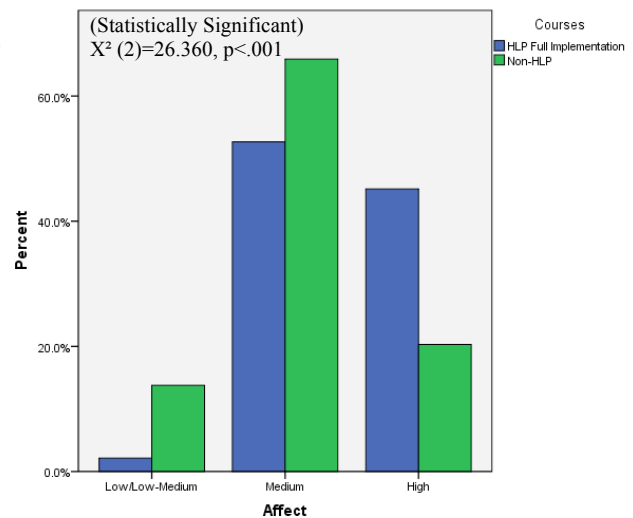
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