



Insight
Improvement
Impact®

Which learning outcomes and teaching methods
are instructors really emphasizing in STEM
courses?

AAC&U Network for Academic
Renewal

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Insight
Improvement
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- **I**ndividual **D**evelopment and **E**ducational **A**ssessment
- Kellogg Grant in 1975
- Non-profit Organization in 2001
- Mission

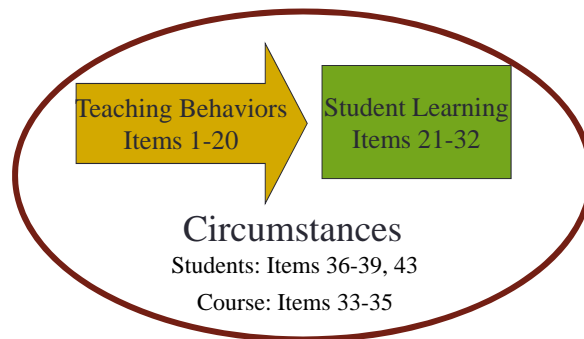
**To serve colleges and universities committed
to improving learning, teaching, and
leadership performance.**

Session Overview

- Introduction to the IDEA Student Learning Model
- What learning objectives are emphasized in STEM classes?
- How much learning are students reporting on those learning objectives?
 - Are there differences for courses enrolling primarily majors or non-majors?
- What teaching methods might be employed to support greater student learning?
- What are student and course characteristics STEM courses?
 - What influence could these have on student learning?

Student Learning Model

- Specific teaching methods influence certain types of student progress (learning) under certain circumstances.



Learning Objective Category	Diagnostic Form Item Number
Basic Cognitive Background	21, 22
Applications of Learning	23, 24
Expressiveness	26, 28
Intellectual Development	27, 30, 31
Lifelong Learning	29, 32
Team Skills	25

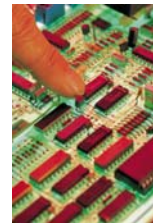
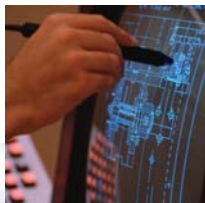
Teaching Method Category	Diagnostic Form Item Number
Stimulating Student Interest	4, 8, 13, 15
Fostering Student Collaboration	5, 16, 18
Establishing Rapport	1, 2, 7, 20
Encouraging Student Involvement	9, 11, 14, 19
Structuring Classroom Experiences	3, 6, 10, 12, 17

Procedure

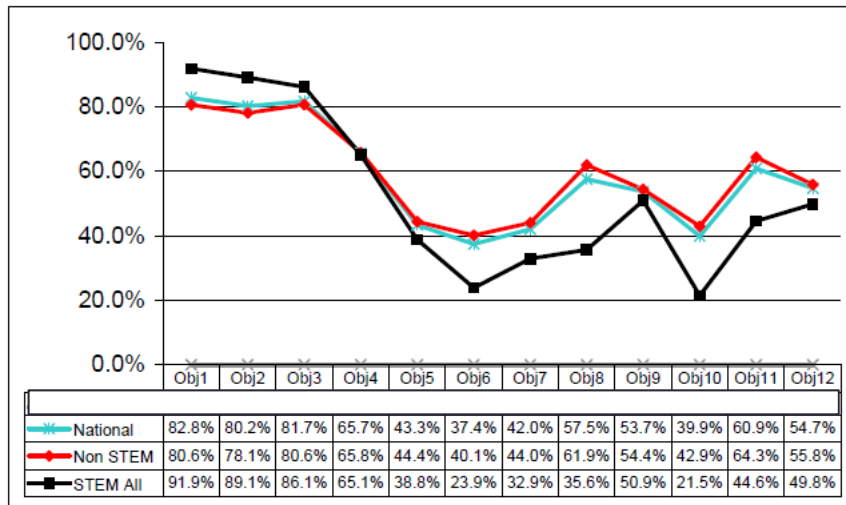
- Classes using IDEA in academic years 2007-2011
- STEM Classes - 283,176
- Non-Stem Classes – 1,800,013
- National (All) Classes - 2,083,189

Discussion Question

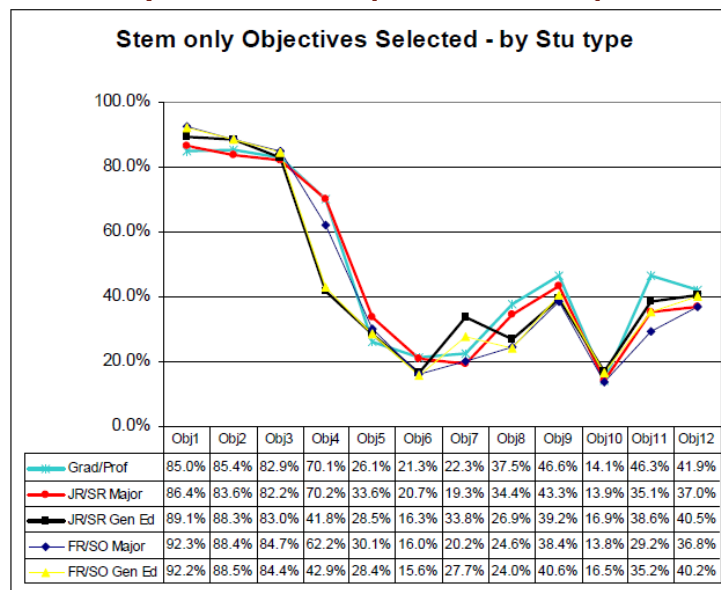
- Of the 12 IDEA Learning Objectives, which are the 5 most frequently selected by faculty as being Important or Essential in STEM courses?



Which learning objectives are emphasized in STEM classes?



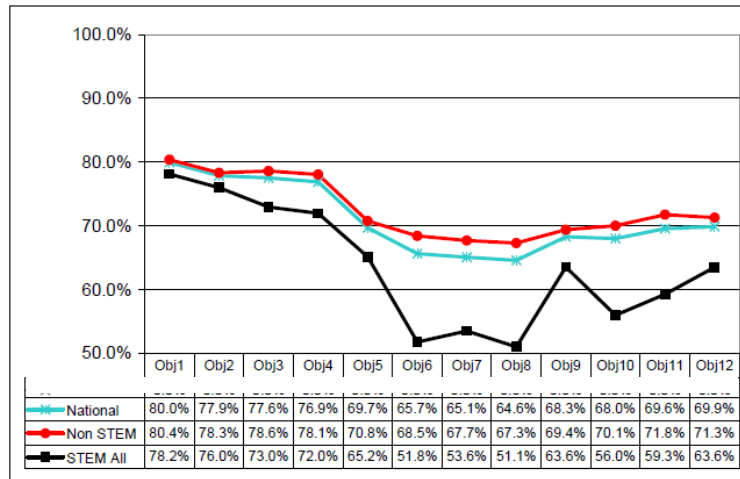
Are different objectives emphasized by course level?



How much learning are students reporting on those learning objectives?

Progress on Relevant Objectives

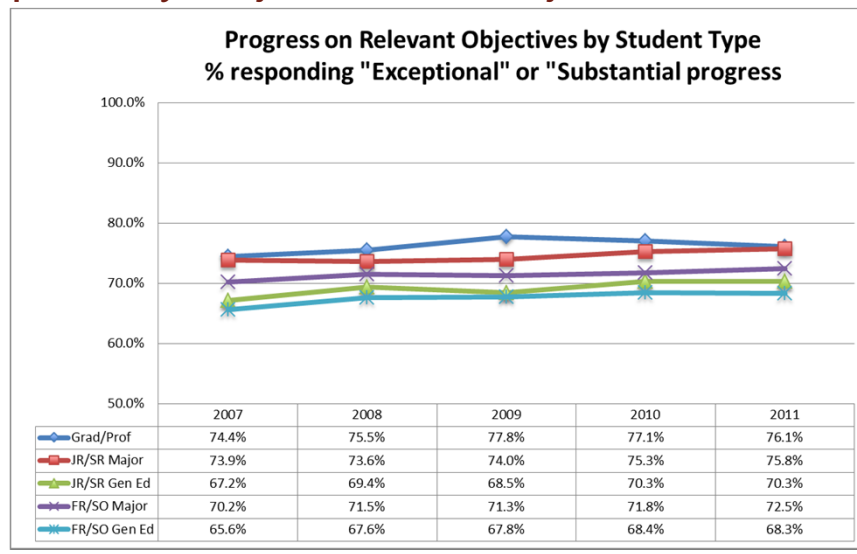
% responding "Exceptional" or "Substantial" progress



Are there differences for courses enrolling primarily majors or non-majors?

Progress on Relevant Objectives by Student Type

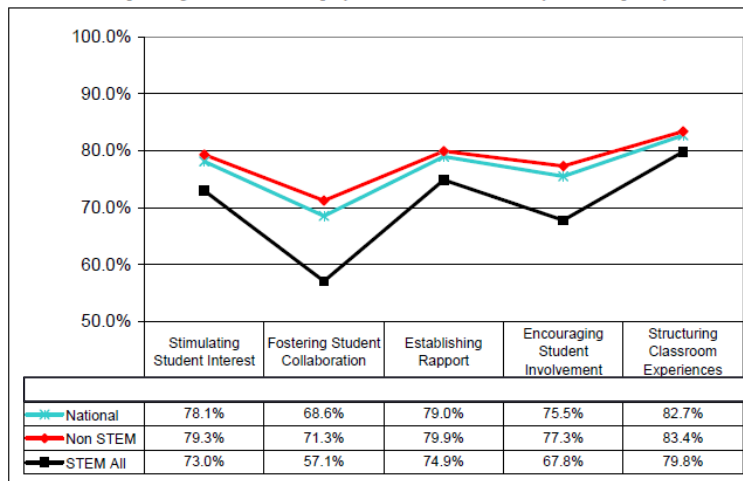
% responding "Exceptional" or "Substantial progress"



Which teaching methods might be employed to support greater student learning?

Teaching Methods and Styles

% responding that instructor employed methods "Almost Always" or "Frequently"

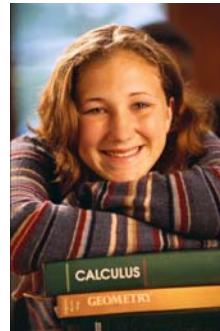


What are student characteristics in STEM courses?

Student Motivation
Student Work Habits

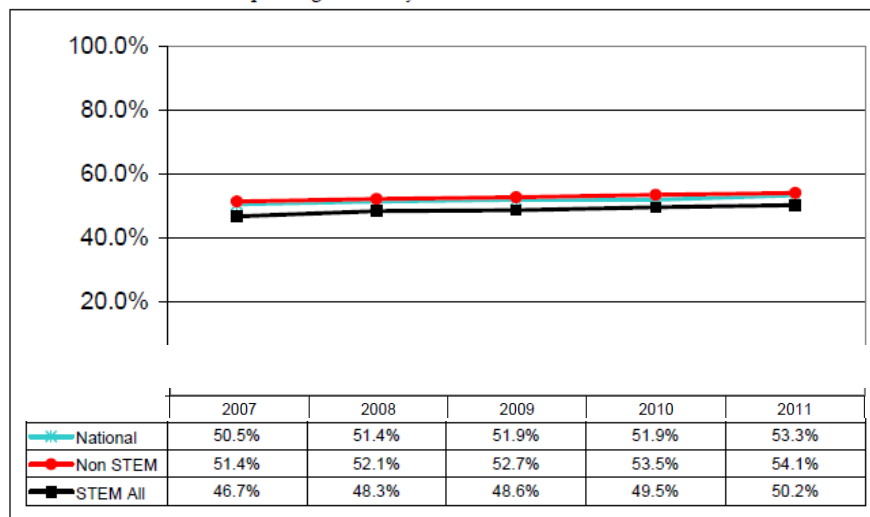


Student Motivation



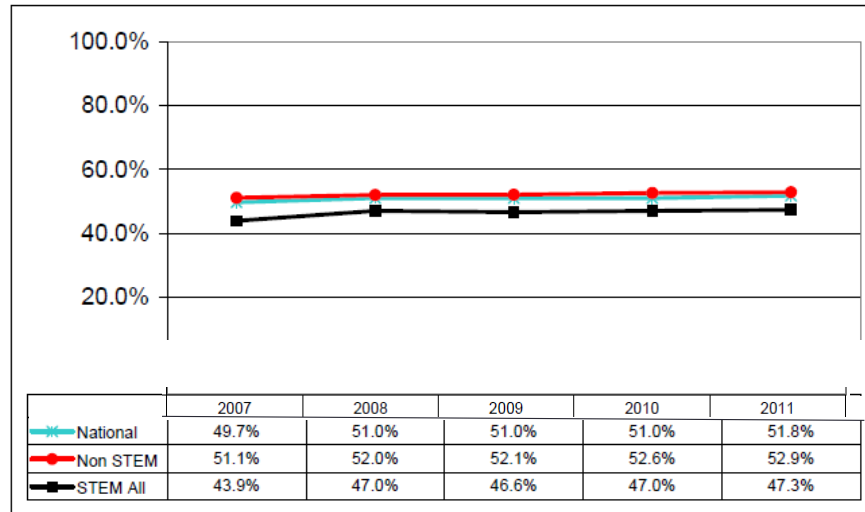
I really wanted to take this course regardless of who taught it

% responding "Definitely True" or "More True than False"



I really wanted to take a course from this instructor

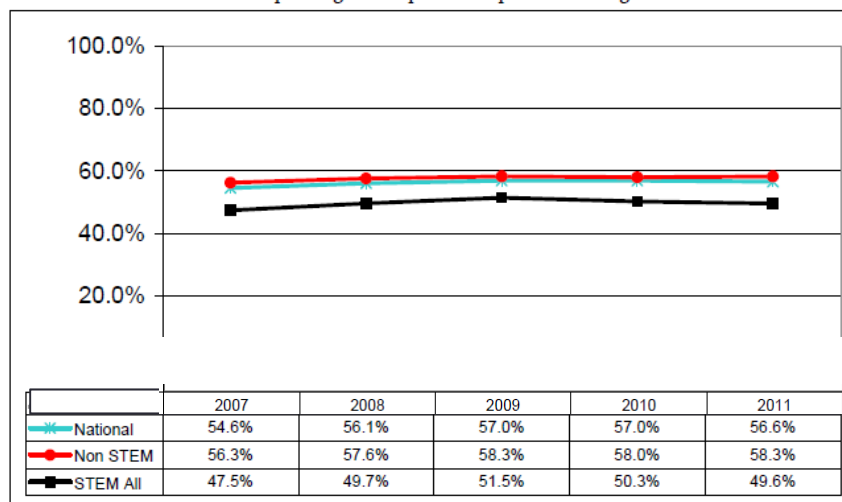
% responding "Definitely True" or "More True than False"



Faculty Response:

Student enthusiasm for the course

% responding "Had a positive impact on learning"

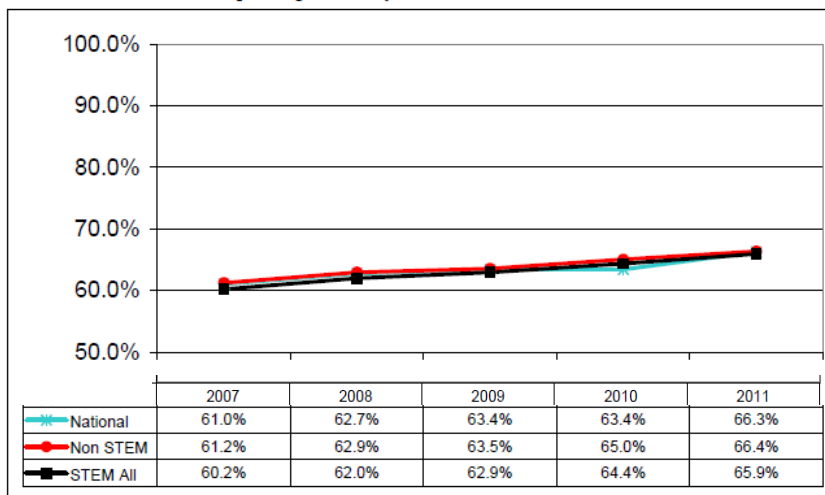


Student Work Habits & Effort



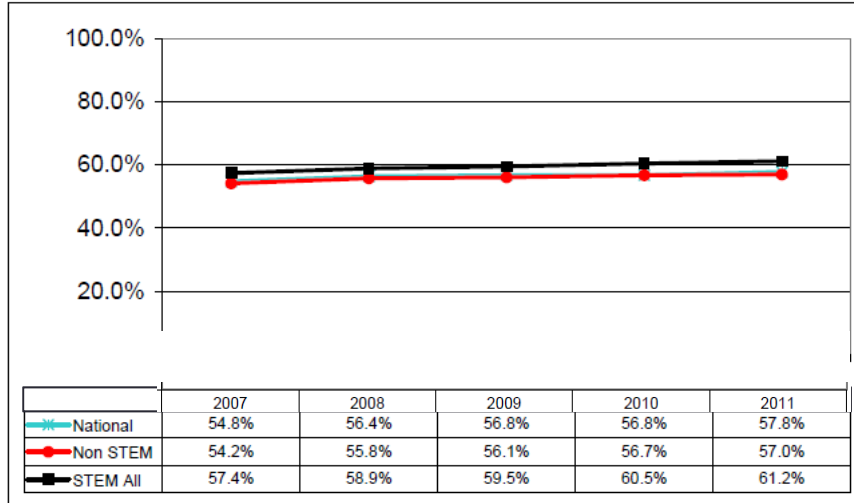
As a rule, I put forth more effort than other students on academic work

% responding "Definitely True" or "More True than False"



I worked harder on this course than on most courses I have taken

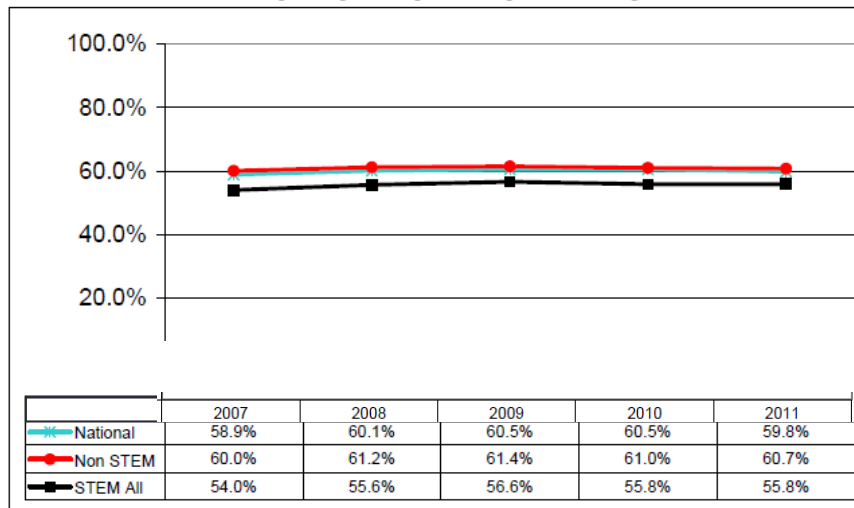
% responding "Definitely True" or "More True than False"



Faculty Response

Student effort to learn

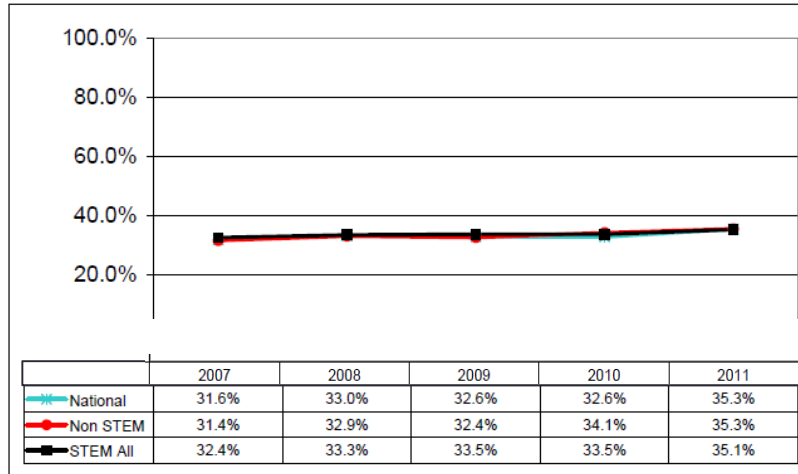
% responding "Had a positive impact on learning"



Faculty Response:

Adequacy of students' background and preparation for the course

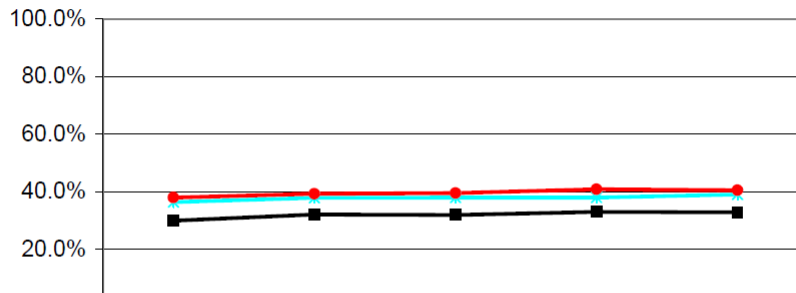
% responding "Had a positive impact on learning"



Course Characteristics

Response to: Amount of Reading

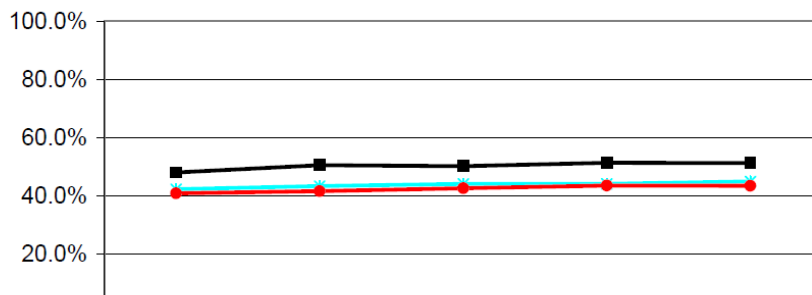
% of students responding with "Much More than Most Courses" or "More than Most Courses"



	2007	2008	2009	2010	2011
National	36.3%	37.8%	37.9%	37.9%	39.0%
Non STEM	37.9%	39.3%	39.4%	40.8%	40.5%
STEM All	29.8%	32.0%	31.8%	32.9%	32.7%

Response to: Amount of work in other (non-reading) assignments

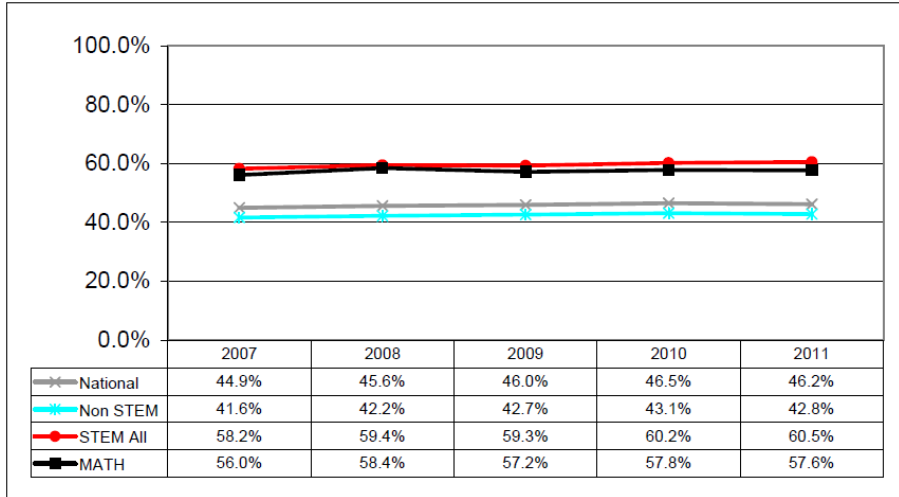
% of students responding with "Much More than Most Courses" or "More than Most Courses"



	2007	2008	2009	2010	2011
National	42.4%	43.5%	44.2%	44.2%	45.1%
Non STEM	41.0%	41.7%	42.7%	43.6%	43.6%
STEM All	48.1%	50.6%	50.3%	51.5%	51.4%

Response to: Difficulty of subject matter

% of students responding with "Much More than Most Courses" or "More than Most Courses"

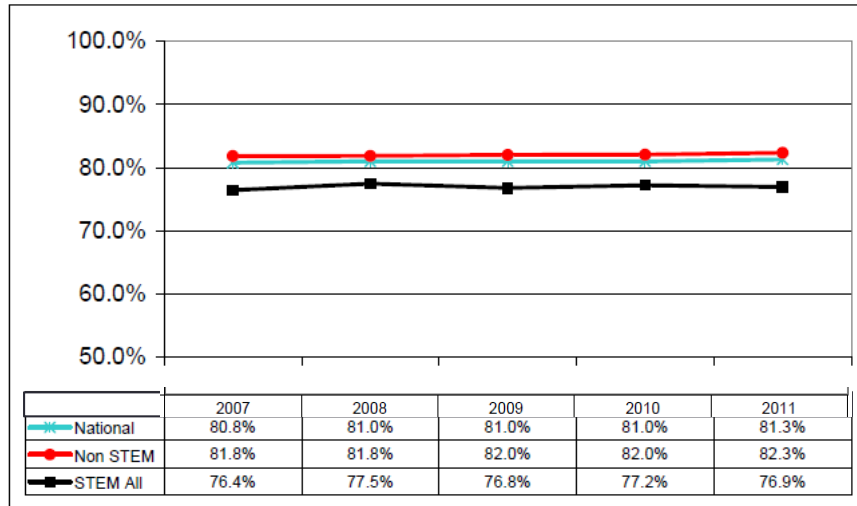


Summary Ratings



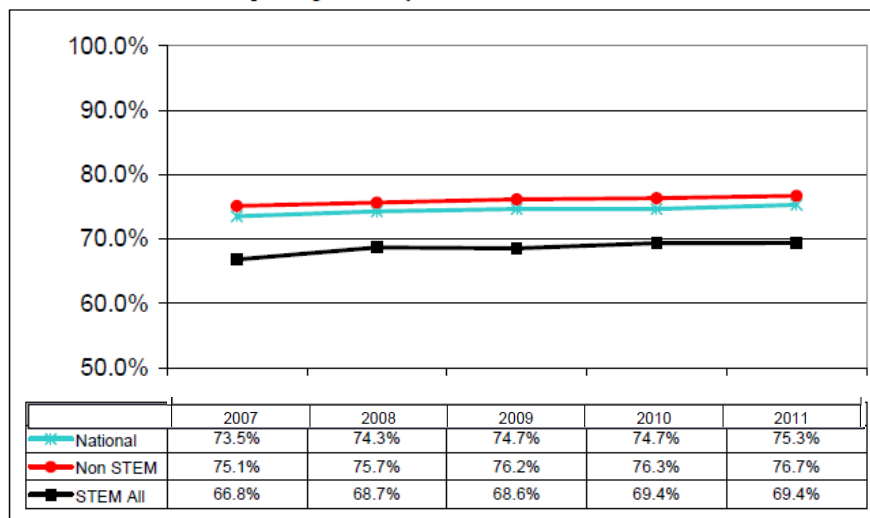
Overall, I rate this instructor an excellent teacher

% responding "Definitely True" or "More True than False"



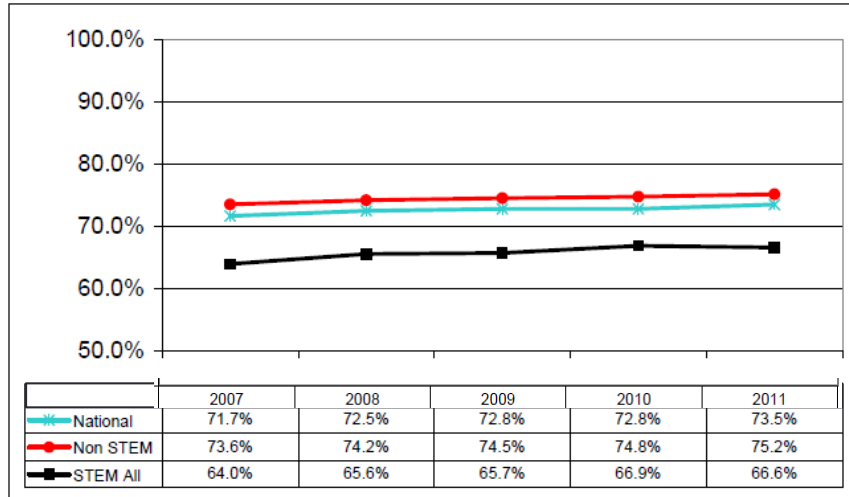
Overall, I rate this course as excellent

% responding "Definitely True" or "More True than False"



As a result of taking this course, I have more positive feelings toward this field of study

% responding "Definitely True" or "More True than False"



Discussion



- Which results confirmed what you might think about STEM courses?
- Which results were surprising?
- What additional insights or questions do you have?