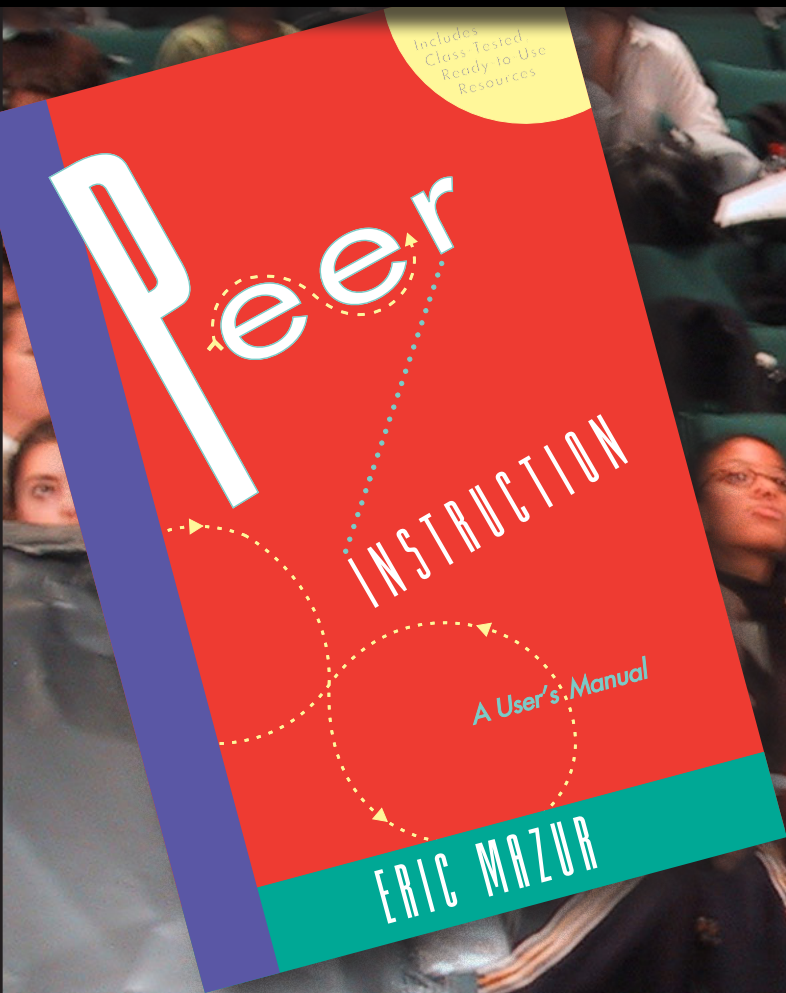


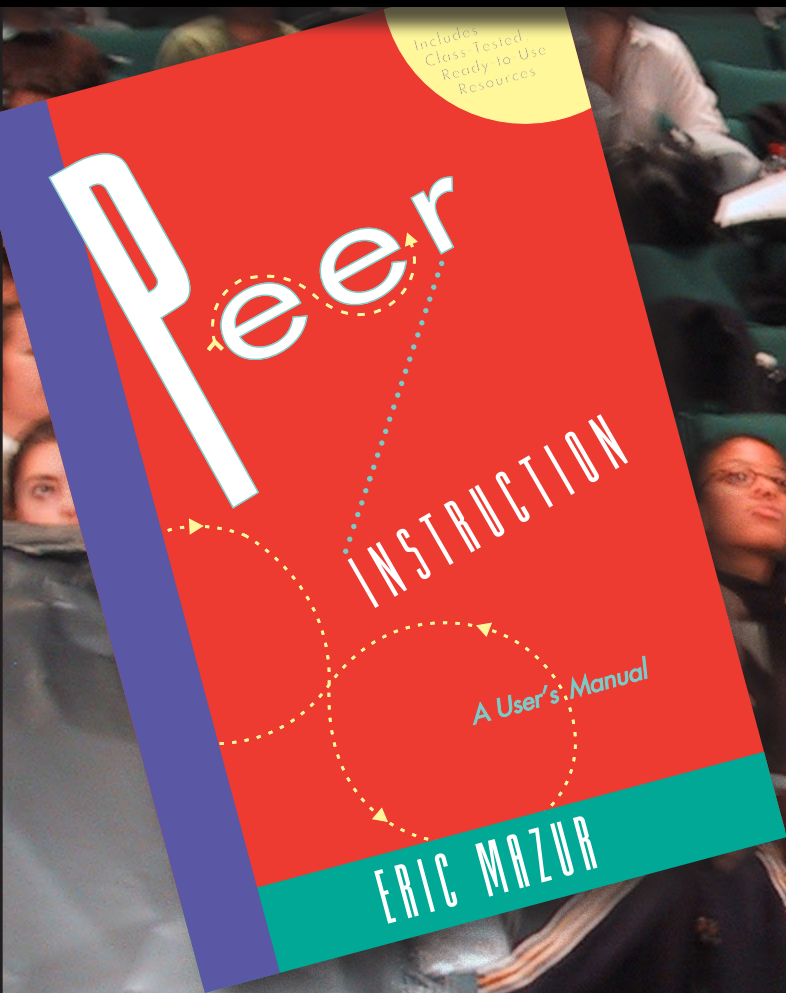
The Peer Instruction Story



New Trends in Physics Teaching
BUAP
Puebla, Mexico, 24 May 2013



The Peer Instruction Story



New Trends in Physics Teaching
BUAP
Puebla, Mexico, 24 May 2013



serendipity

Outline

- **PI Time Line**
- **Dissemination**
- **Lessons learned**

PI Time Line

Teaching @ harvard

Sep 1984



1984

1985

1986

1987

1988

1989

PI Time Line

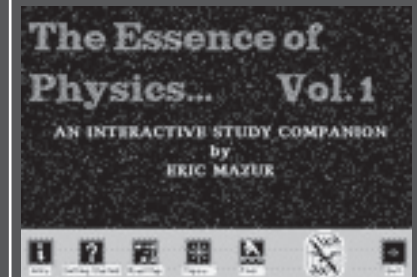
Teaching @ harvard

Sep 1984



Essence

Dec 1988



1984

1985

1986

1987

1988

1989

PI Time Line

1990

FCI
Sep 1990

1991

1992

1993

1994

1995

PI Time Line

FCI
Sep 1990

Peer Instruction

Sep 1991



1990

1991

1992

1993

1994

1995

PI Time Line

Peer Instruction

Sep 1991



FCI

Sep 1990

NSF CCLI

Dec 1991



1990

1991

1992

1993

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PI Time Line

Peer Instruction

Sep 1991



FCI

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NSF CCLI

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PI Time Line

FCI
Sep 1990

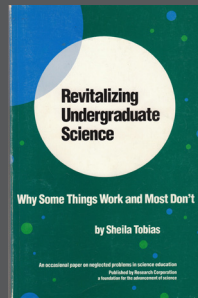
Peer Instruction
Sep 1991



NSF CCLI
Dec 1991



Tobias
May 1992



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PI Time Line

FCI
Sep 1990

Peer Instruction

Sep 1991

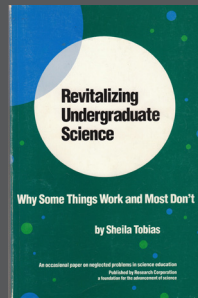


NSF CCLI
Dec 1991



Tobias

May 1992



NSF

June 1992



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PI Time Line

FCI

Sep 1990

Peer Instruction

Sep 1991



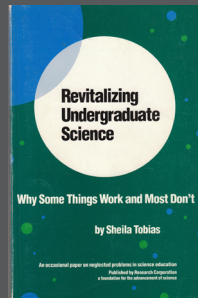
NSF CCLI

Dec 1991



Tobias

May 1992



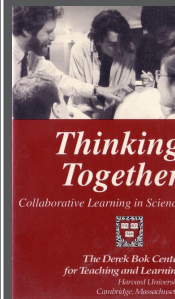
NSF

June 1992



Video

Sep 1992



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PI Time Line

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FCI
Sep 1990

1991

Peer Instruction

Sep 1991



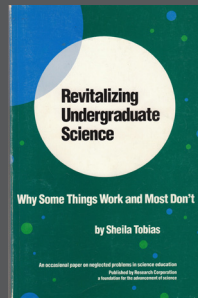
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Dec 1991



1992

Tobias

May 1992



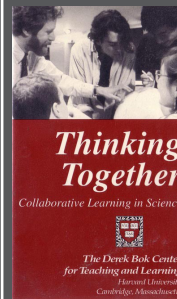
NSF

June 1992



Video

Sep 1992



1993

RPI

May 1993



1994

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PI Time Line

1990

FCI
Sep 1990

1991

Peer Instruction
Sep 1991

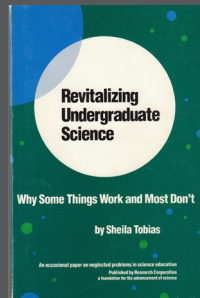


NSF CCLI
Dec 1991



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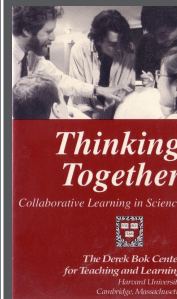
Tobias
May 1992



NSF
June 1992



Video
Sep 1992



1993

RPI
May 1993



ClassTalk
Sep 1993



1994

1995

PI Time Line

FCI
Sep 1990

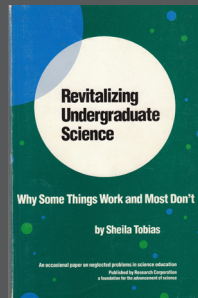
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Sep 1991



NSF CCLI
Dec 1991



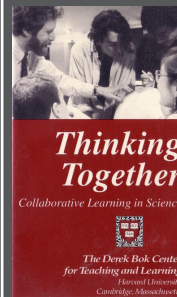
Tobias
May 1992



NSF
June 1992



Video
Sep 1992



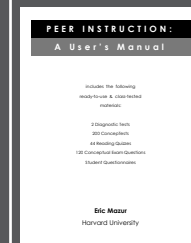
RPI
May 1993



ClassTalk
Sep 1993



Manual
Mar 1994



1990

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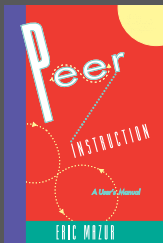
1994

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PI Time Line

PI Manual

May 1996



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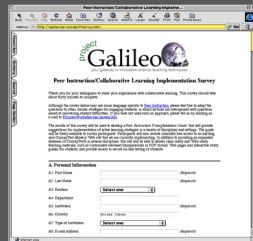
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PI Time Line

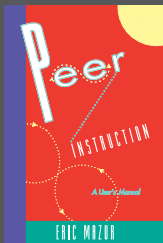
Project Galileo

May 1997



PI Manual

May 1996



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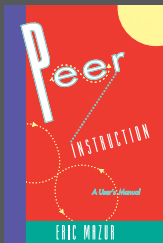
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PI Time Line

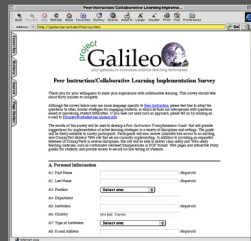
PI Manual

May 1996



Project Galileo

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AAPT NFW

Oct 1997

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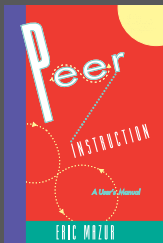
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PI Time Line

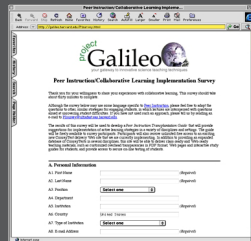
PI Manual

May 1996



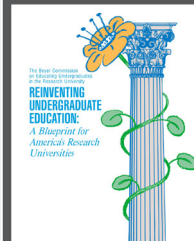
Project Galileo

May 1997



Boyer Report

Apr 1998



AAPT NFW

Oct 1997

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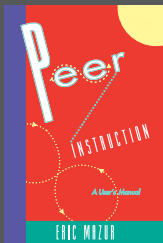
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PI Time Line

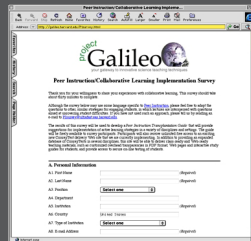
PI Manual

May 1996



Project Galileo

May 1997



Boyer Report

Apr 1998



PRS

Sep 1999



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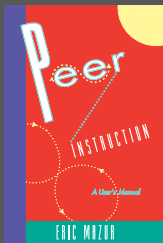
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Oct 1997

PI Time Line

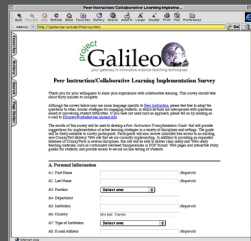
PI Manual

May 1996



Project Galileo

May 1997



Boyer Report

Apr 1998



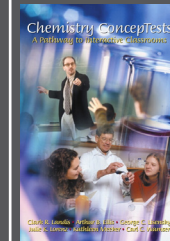
PRS

Sep 1999



Chemistry

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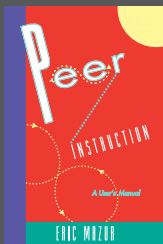
AAPT NFW

Oct 1997

PI Time Line

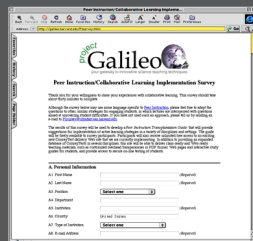
PI Manual

May 1996



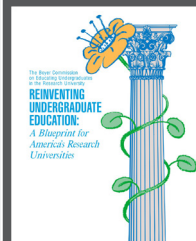
Project Galileo

May 1997



Boyer Report

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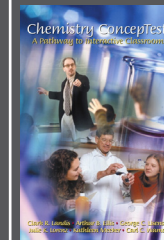
PRS

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Chemistry

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AAPT NFW

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PI Time Line

DTS Award

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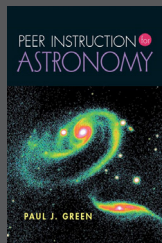
PI Time Line

DTS Award

Nov 2001

Astronomy

2002



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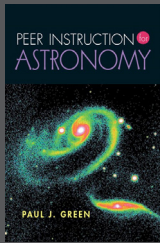
PI Time Line

DTS Award

Nov 2001

Astronomy

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DVD proposal

Mar 2002



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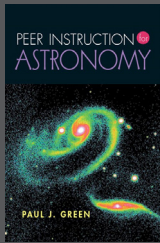
PI Time Line

DTS Award

Nov 2001

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DVD proposal

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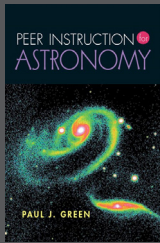
PI Time Line

DTS Award

Nov 2001

Astronomy

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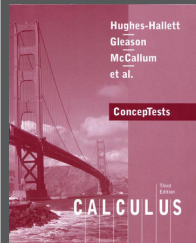
DVD proposal

Mar 2002



Calculus

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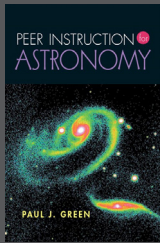
PI Time Line

DTS Award

Nov 2001

Astronomy

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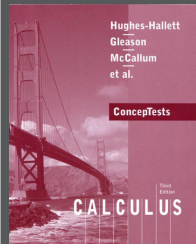
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Mar 2002



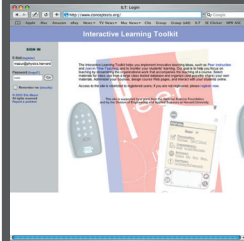
Calculus

2003



ILT

May 2003



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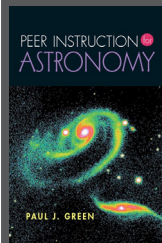
PI Time Line

DTS Award

Nov 2001

Astronomy

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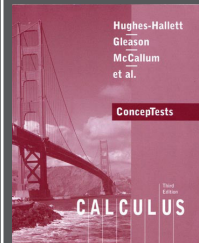
DVD proposal

Mar 2002



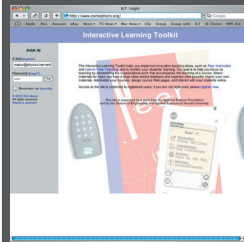
Calculus

2003



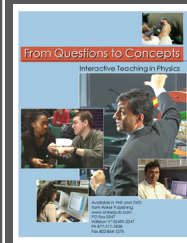
ILT

May 2003



Documentary

May 2004



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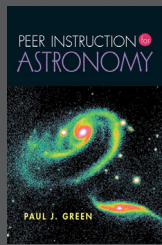
PI Time Line

DTS Award

Nov 2001

Astronomy

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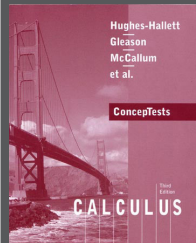
DVD proposal

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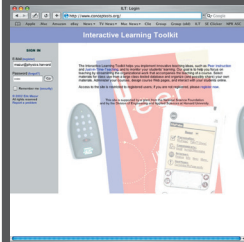
Calculus

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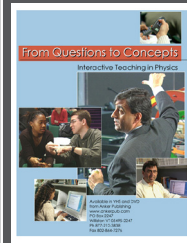
ILT

May 2003



Documentary

May 2004



Wireless devices

Jan 2005



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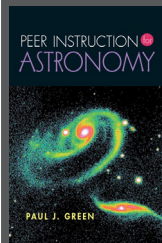
PI Time Line

DTS Award

Nov 2001

Astronomy

2002



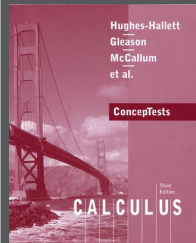
DVD proposal

Mar 2002



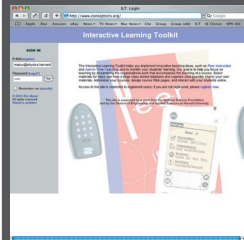
Calculus

2003



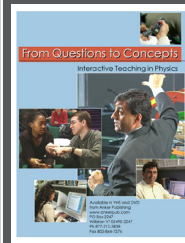
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Documentary

May 2004



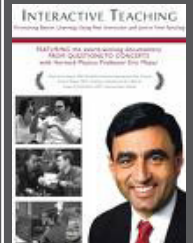
Wireless devices

Jan 2005



DVD

Nov 2006



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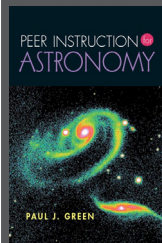
PI Time Line

DTS Award

Nov 2001

Astronomy

2002



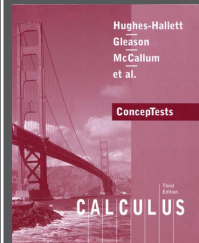
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Mar 2002



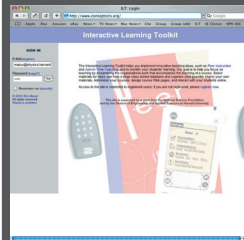
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2003



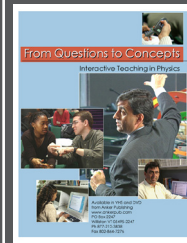
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May 2003



Documentary

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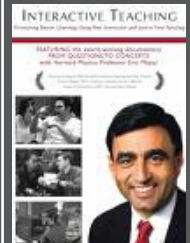
Wireless devices

Jan 2005



DVD

Nov 2006



2x NFW

June 2007

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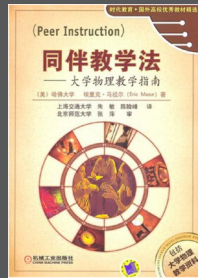
2006

2007

PI Time Line

Chinese translation

March 2009



2009

2010

2011

2012

2013

2014

PI Time Line

Chinese translation

March 2009



Talk online

November 2009



2009

2010

2011

2012

2013

2014

PI Time Line

Chinese translation

March 2009



Learning Catalytics

June 2011



Talk online

November 2009



2009

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2014

PI Time Line

Chinese translation

March 2009



Learning Catalytics

June 2011



Talk online

November 2009



PI Network/blog

Jan 2012



2009

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2013

2014

PI Time Line

Chinese translation

March 2009



Talk online

November 2009



Learning Catalytics

June 2011



PI Network/blog

Jan 2012



COPI2012

Dec 2012



2009

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2013

2014

PI Time Line

Chinese translation

March 2009



Learning Catalytics

June 2011



COPI2012

Dec 2012



Talk online

November 2009



PI Network/blog

Jan 2012



Korean translation

February 2013



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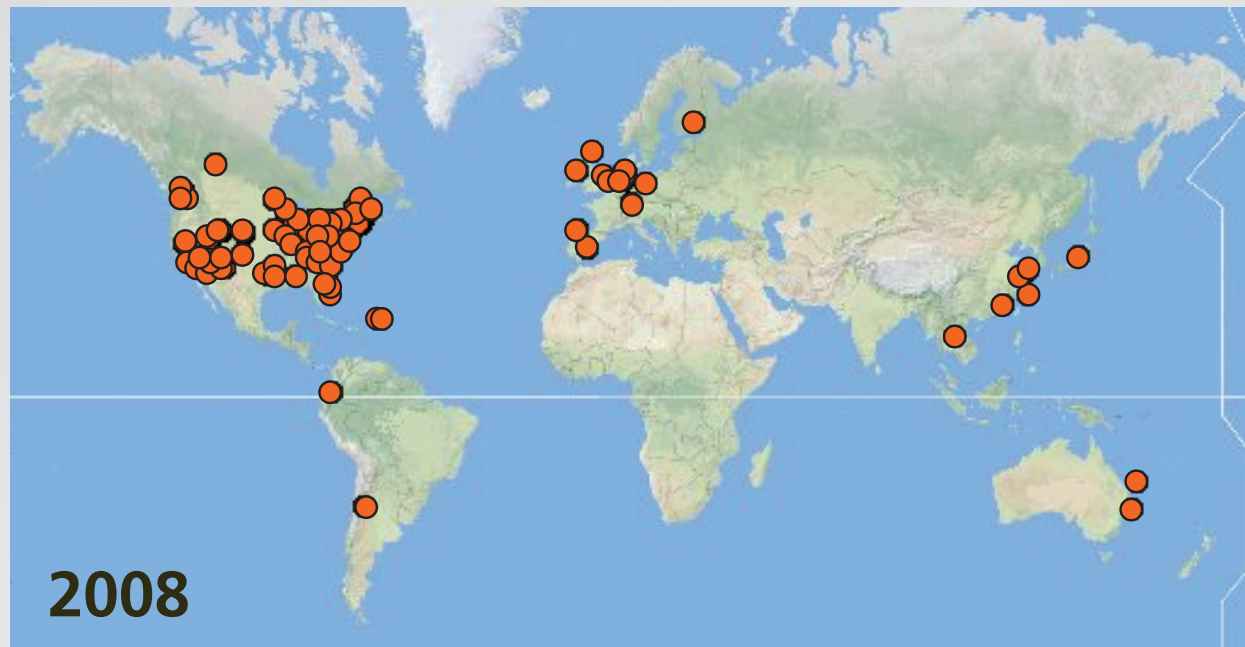
2012

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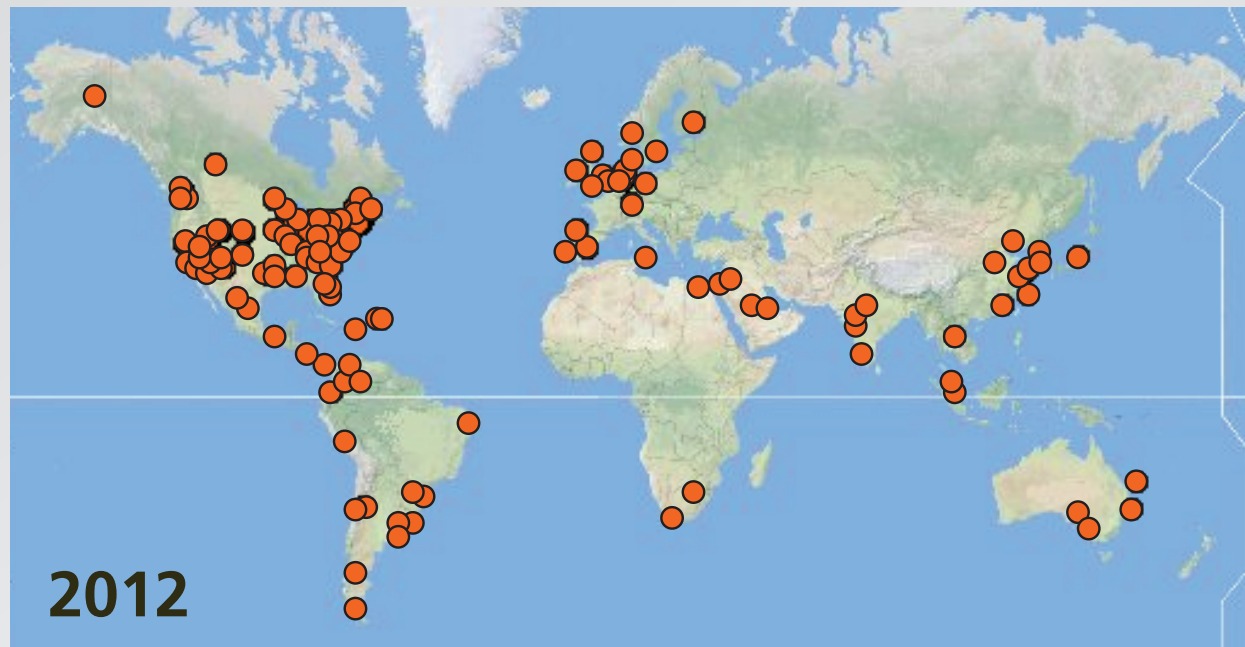
Dissemination

lecturing



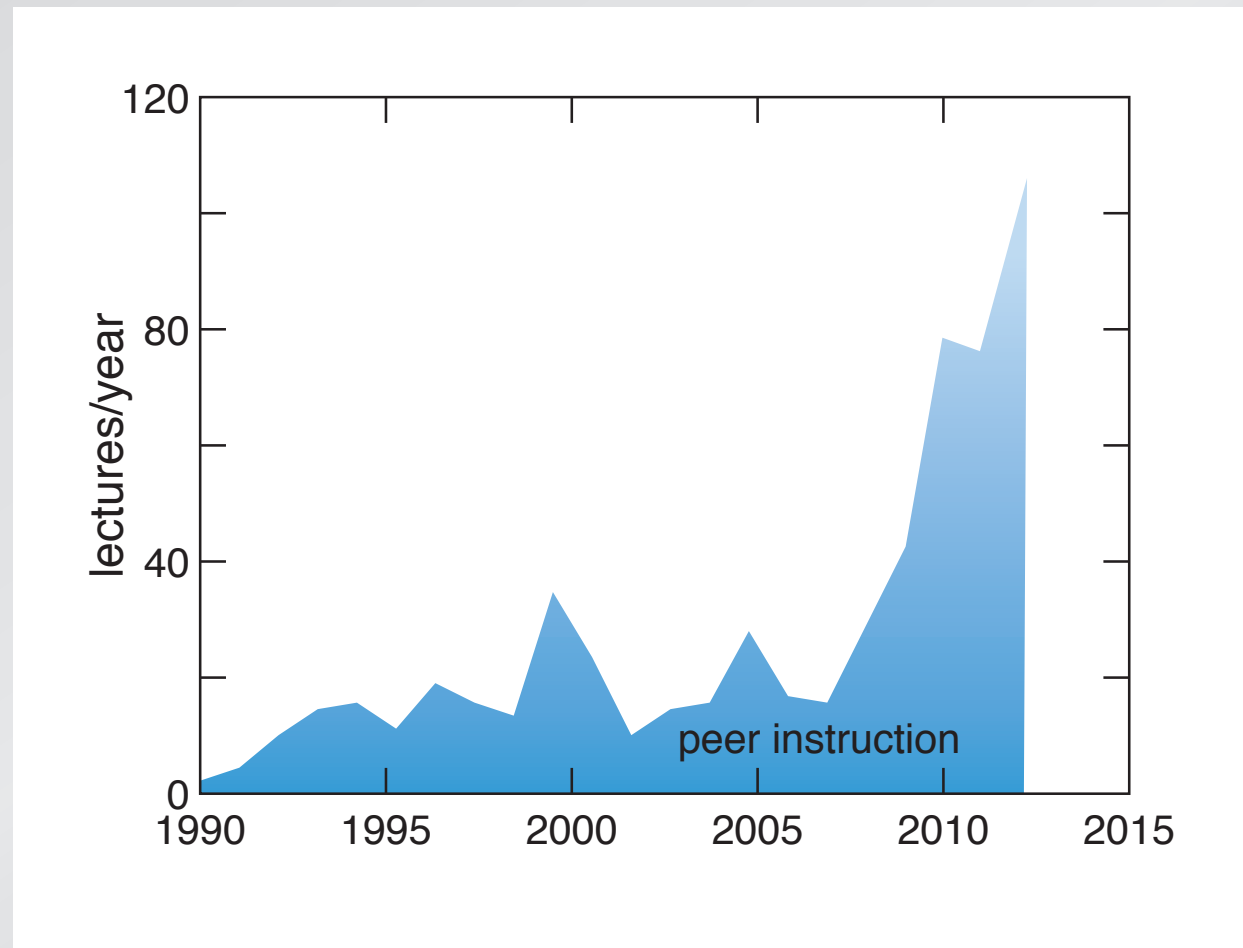
Dissemination

lecturing



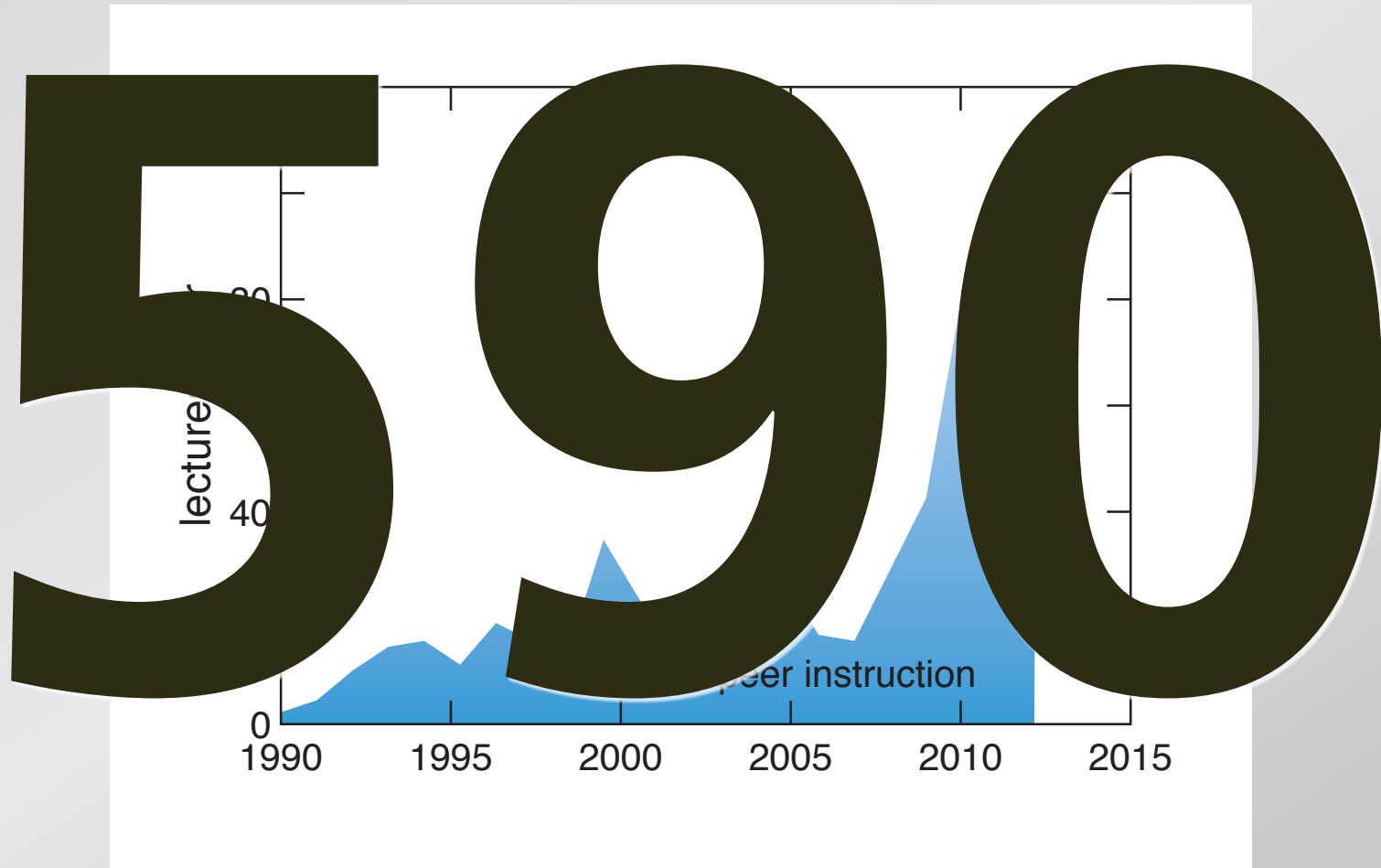
Dissemination

lecturing



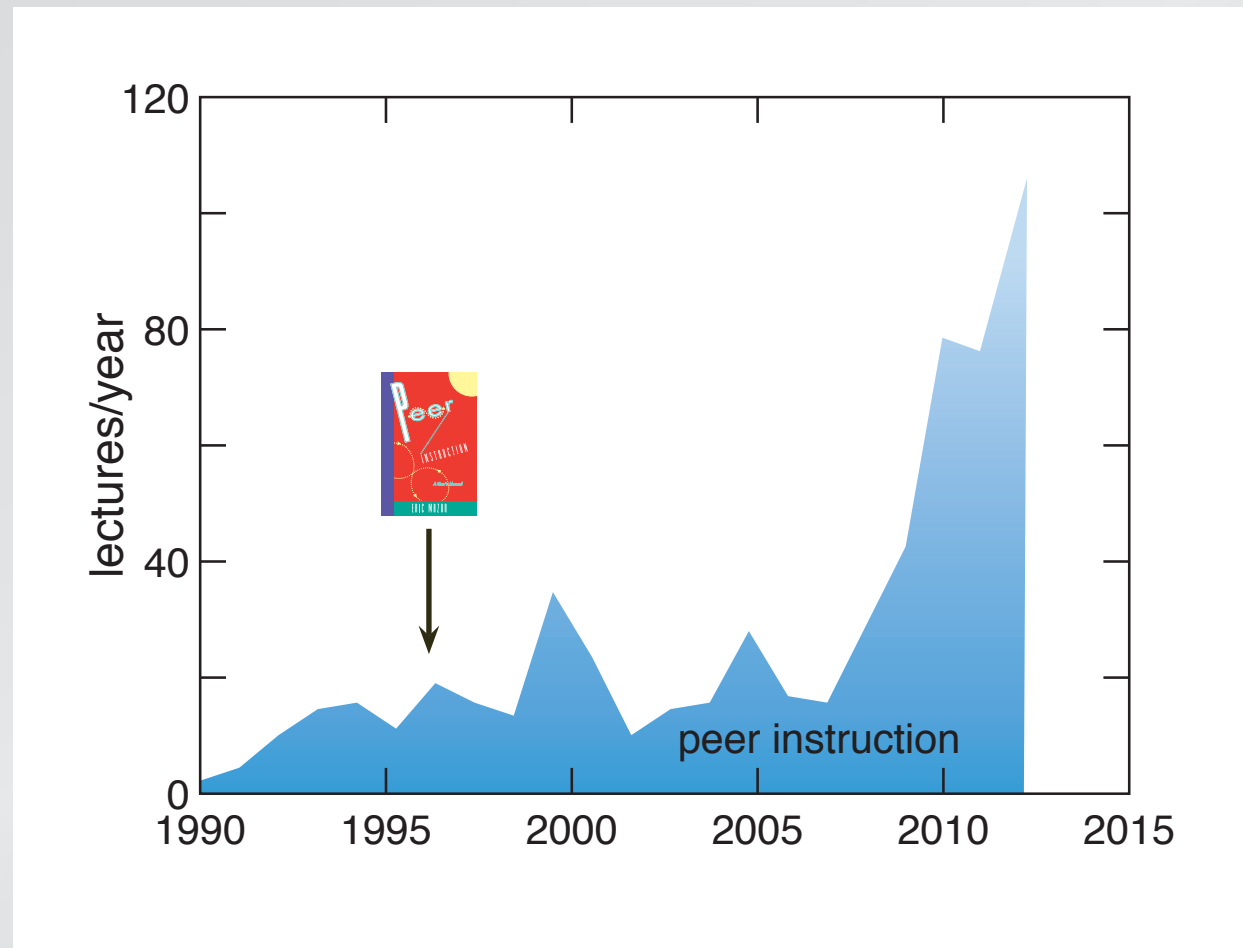
Dissemination

lecturing



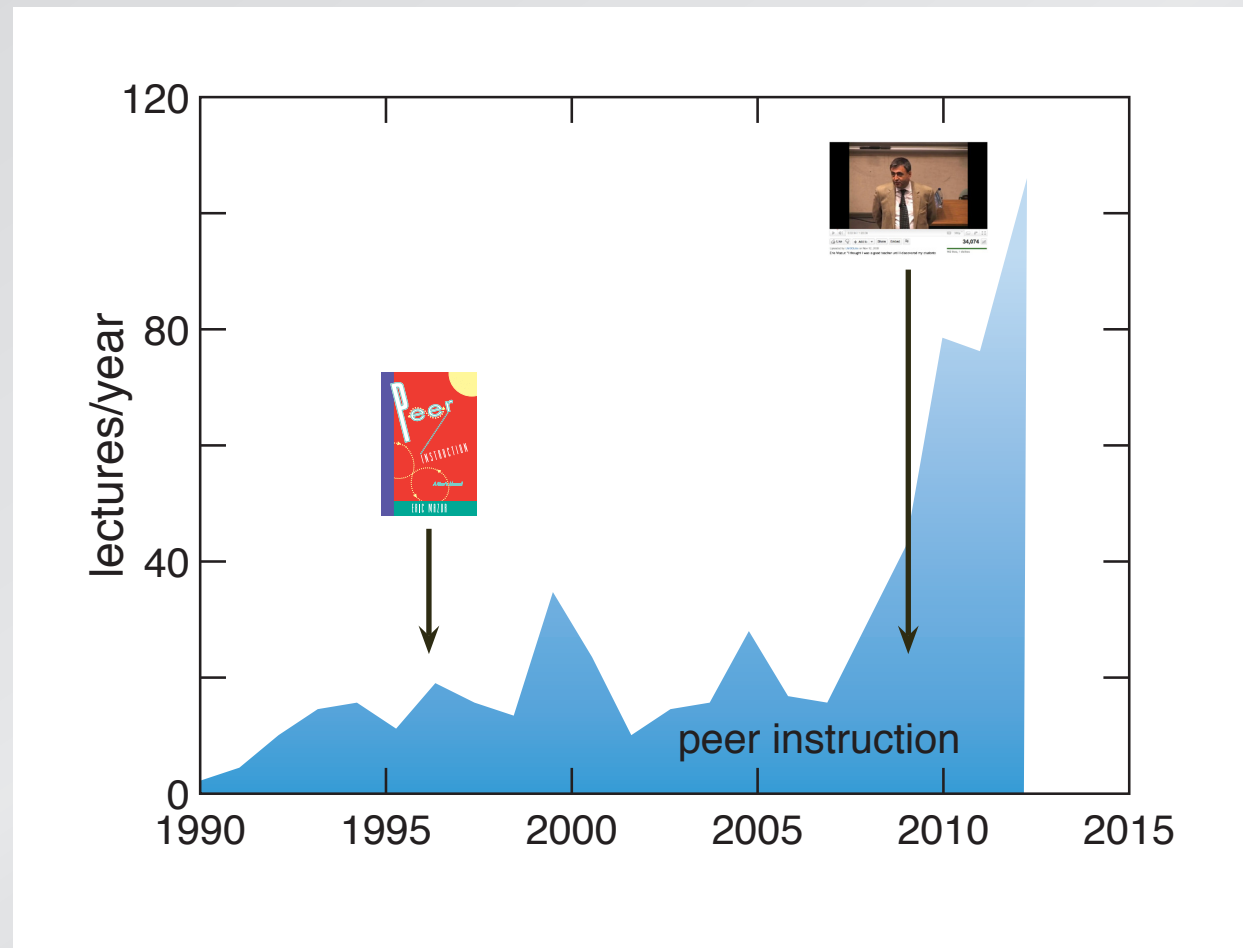
Dissemination

lecturing



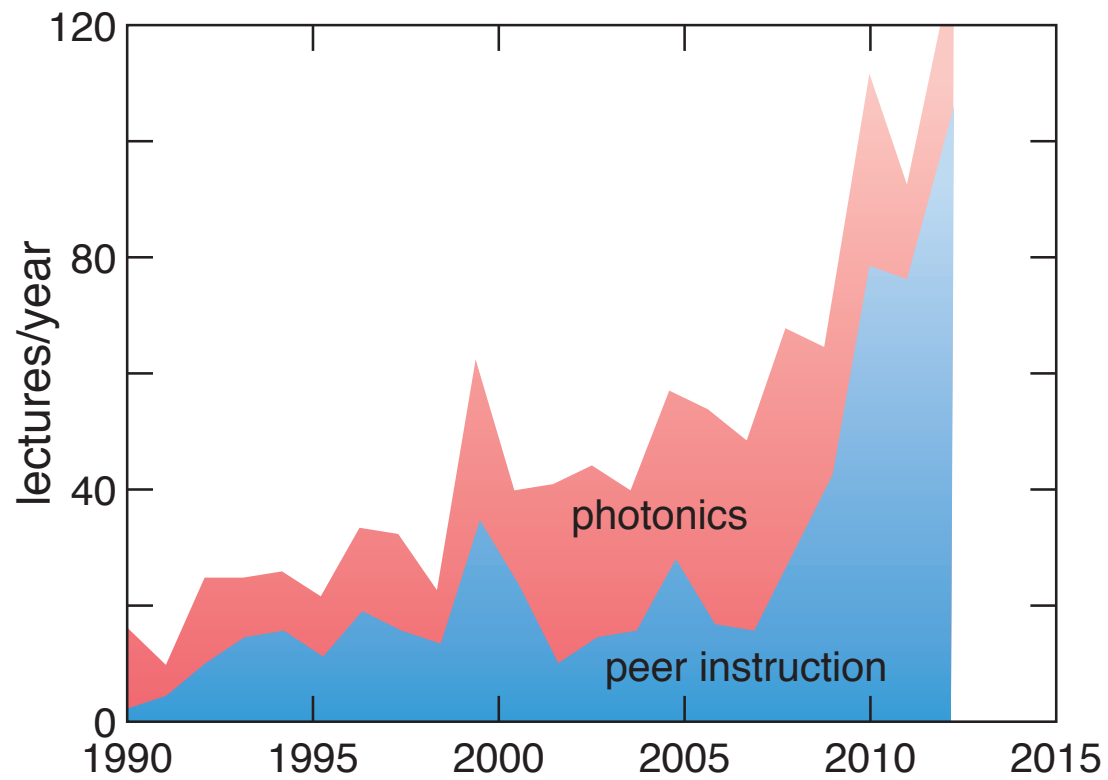
Dissemination

lecturing




Dissemination

lecturing



Dissemination



0:02:34 / 1:20:09

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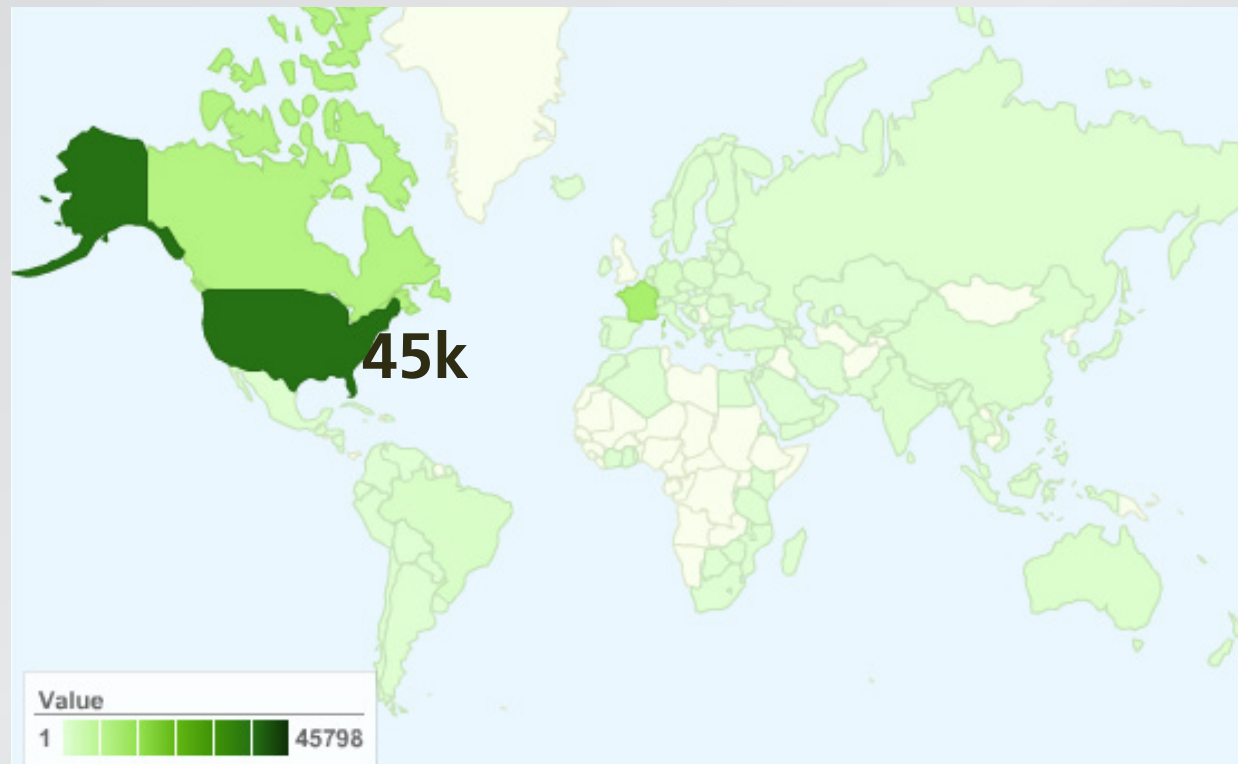
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Dissemination

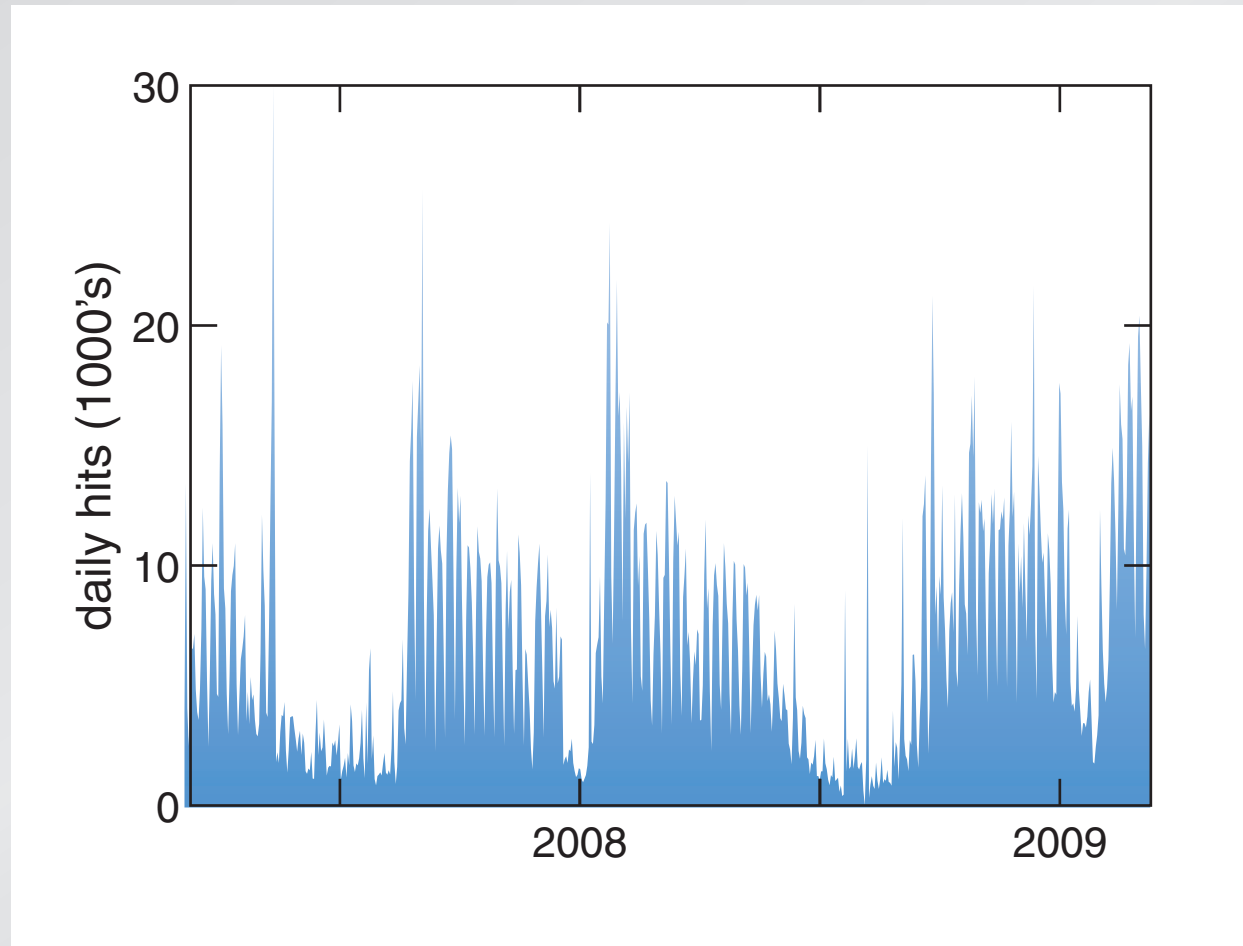
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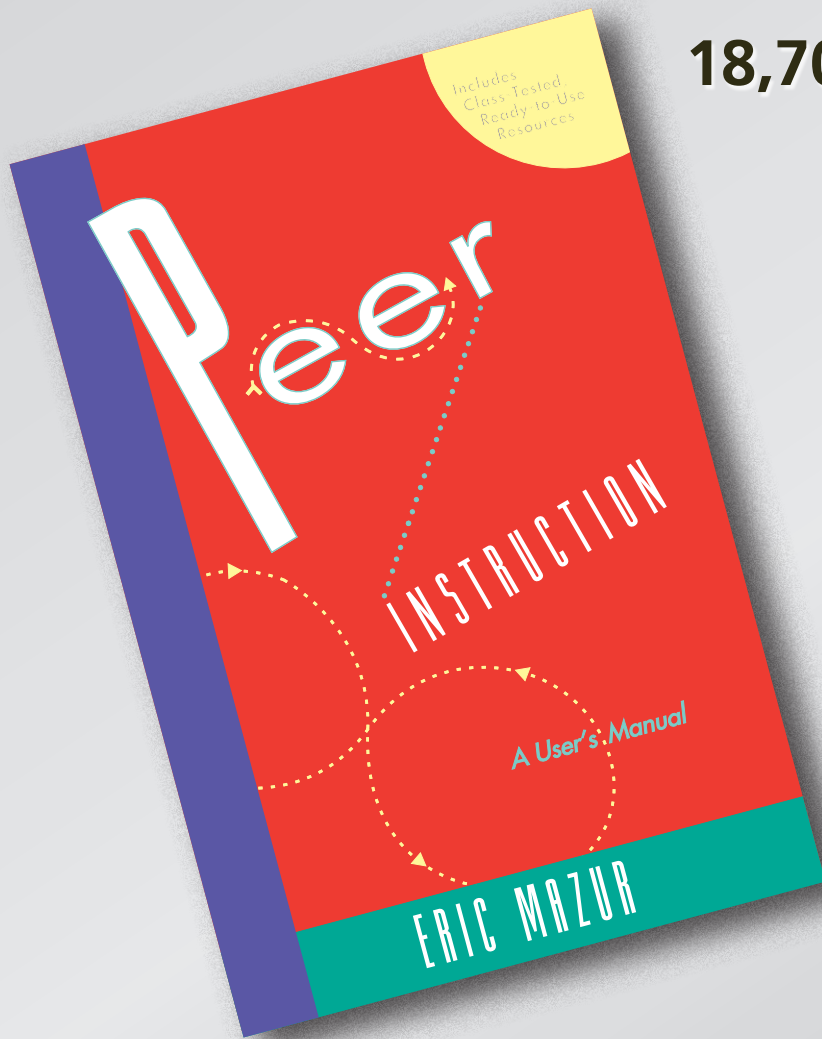
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Dissemination



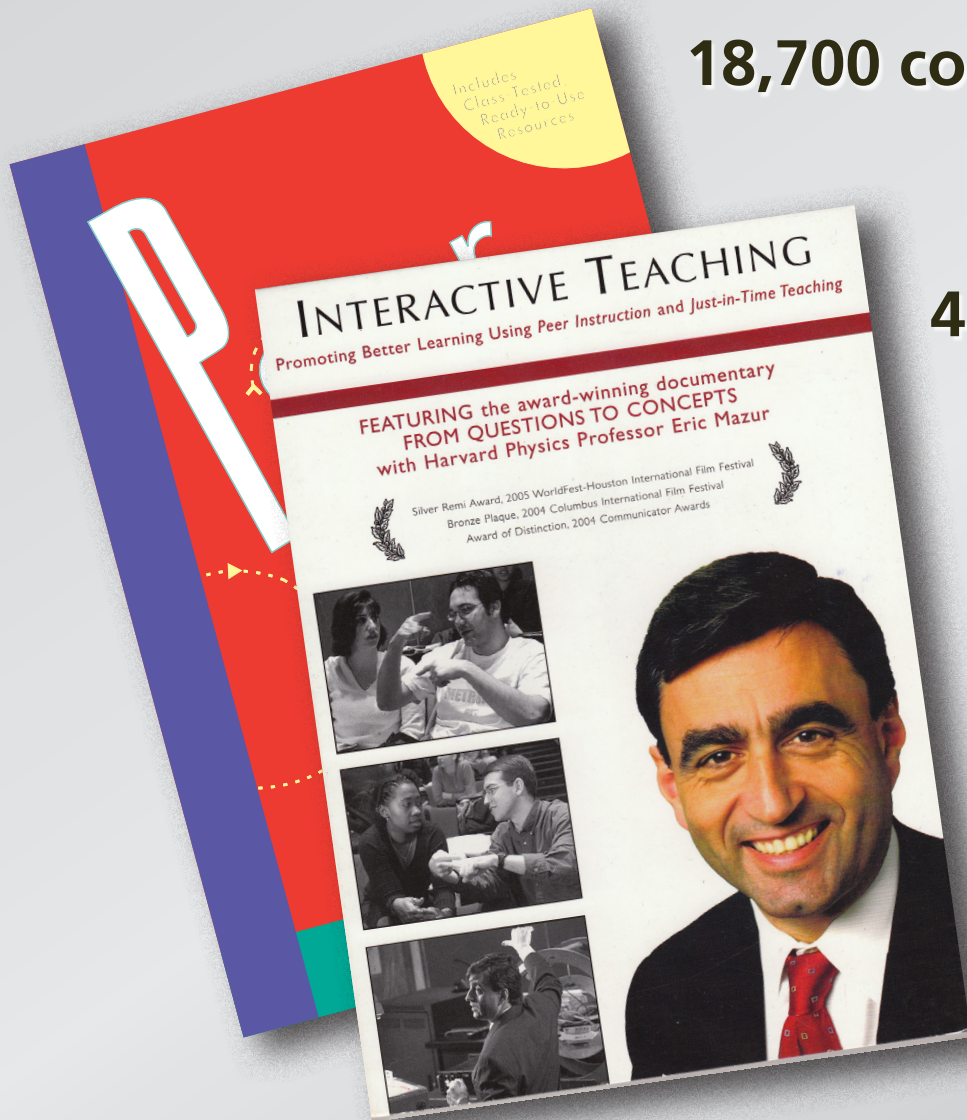
18,700 copies shipped since 1996

(as of 2009)

Dissemination

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3,500+ registered users

(2,401 active PI users)

PeerInstruction.net

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The screenshot shows a web browser window displaying the homepage of the 'Turn to Your Neighbor' blog. The browser's address bar shows 'blog.peerinstruction.net'. The page has a red header with the site's name and logo. Below the header is a navigation menu with links like 'Home', 'News', 'TV News', 'GTD', 'Tech News', 'Group', 'ILT', 'Harvard', '\$\$', 'Health', 'Travel', and 'Social'. A search bar is located in the top right corner. The main content area features a list of recent articles, each with a title, date, and a short description. On the right side, there is a 'TEACH100' badge indicating the blog is ranked #101, a 'Follow Turn to Your Neighbor' section with an email subscription form, and an 'Info' section with a list of links to various resources.

Turn to Your Neighbor
The Official Peer Instruction Blog

Home

Go to Peer Instruction Network, a community of PI users across the globe

Recent Articles

A two minute video shows the power of using Peer Instruction to flip your classroom
May 6, 2013
Looking for ways to engage your students during class time in a flipped classroom? Something that addresses the wide diversity of preparation among students in your class and works to improve student achievement and problem solving ability? Backed by 20 years of research, Peer Instruction is my favorite way to engage students in class when using a flipped [...]

What is a flipped classroom? (in 60 seconds)
April 22, 2013
What is a flipped classroom? Last week, I plopped down for Sunday brunch in New York City with some non-edu obsessed friends and acquaintances I had not seen in a long time. About 10 seconds after our formal greetings, the person sitting across from me leaned forward and said, "So...not to be too business like, [...]"

The 2 most powerful flipped classroom tips I have learned so far
April 16, 2013
Won't students skip my class if my lectures are available online? This is a question that comes up often in the world of higher education, where class attendance is usually not compulsory. One fine day early Fall of 2012, I took this question with me on my walk from my office in the University of [...]

Learn to do something innovative inside your flipped classroom
April 8, 2013
"If you wanted to create an education environment that was directly opposed to what the brain was good at doing, you probably would design something like a classroom." John Medina, Brain Rules
In a flip class, educators have dedicated a lot of attention and valiant effort to redesigning the most classroom instruction (e.g. lecture) [...]

TEACH100
THIS BLOG IS RANKED
#101

Follow Turn to Your Neighbor
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Join 409 other followers
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Like Peer Instruction on FB

Info

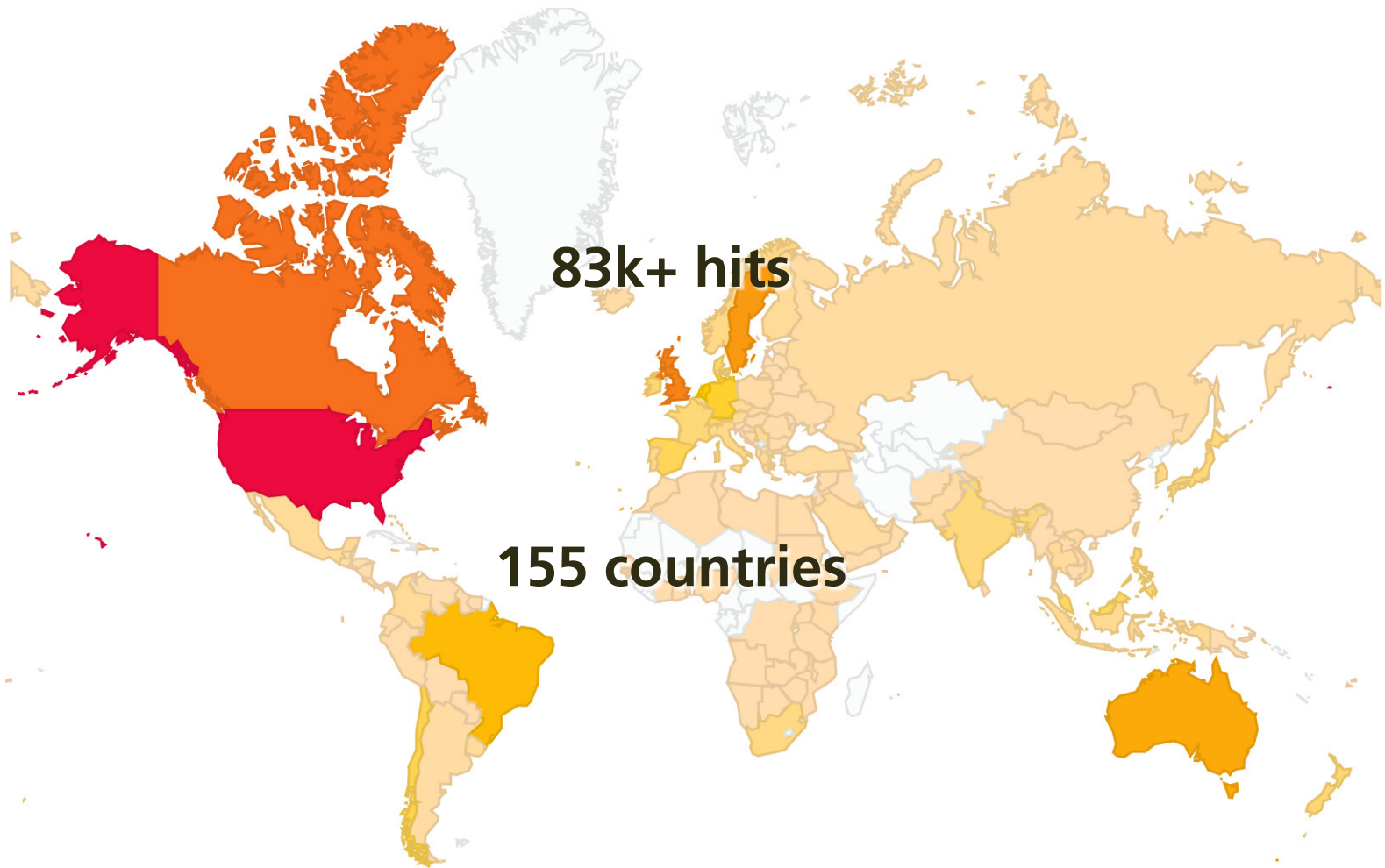
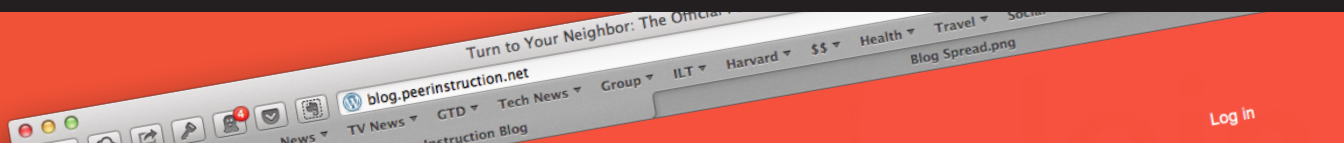
- About Turn to Your Neighbor: The Official Peer Instruction Blog
- An Annotated List of Flipped Class Tools and Resources
- Turn to Peer Instruction Network and connect, share, and learn with innovative educators from across the globe
- Turn to Peer Instruction, Eric, and Julie on Twitter
- Turn to Your Neighbor's Flipped Tip #fliptip Line
- Use of the term Flipped Classroom

now!

Peer

net

Dissemination



Learn to do something innovative inside your imp...
April 8, 2013

"If you wanted to create an education environment that was directly opposed to what the brain was good at doing, you probably would design something like a classroom." John Medina, Brain Rules
In a flip class, educators have dedicated a lot of attention and valiant effort to redesigning
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- Use of the term Flipped Classroom

Dissemination



Dissemination

\$100M/yr



Dissemination

learning | **catalytics**

Dissemination

learning | catalytics

Courses Participate Review Classifications Purchases Users Tour Help

current session: 766079 | 69 students

Map Show floating session ID Edit Delete

6 7 8 9 10 11 12 13 14 15

perpendicular mirrors as shown below.

Deliver Show all results

Round 1

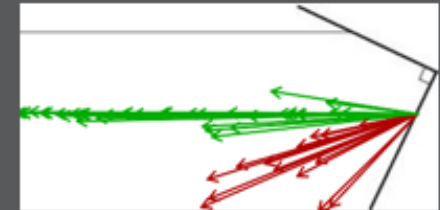
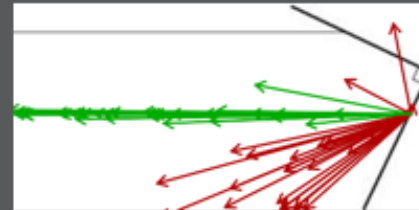


57 responses, 58% correct

Round 2



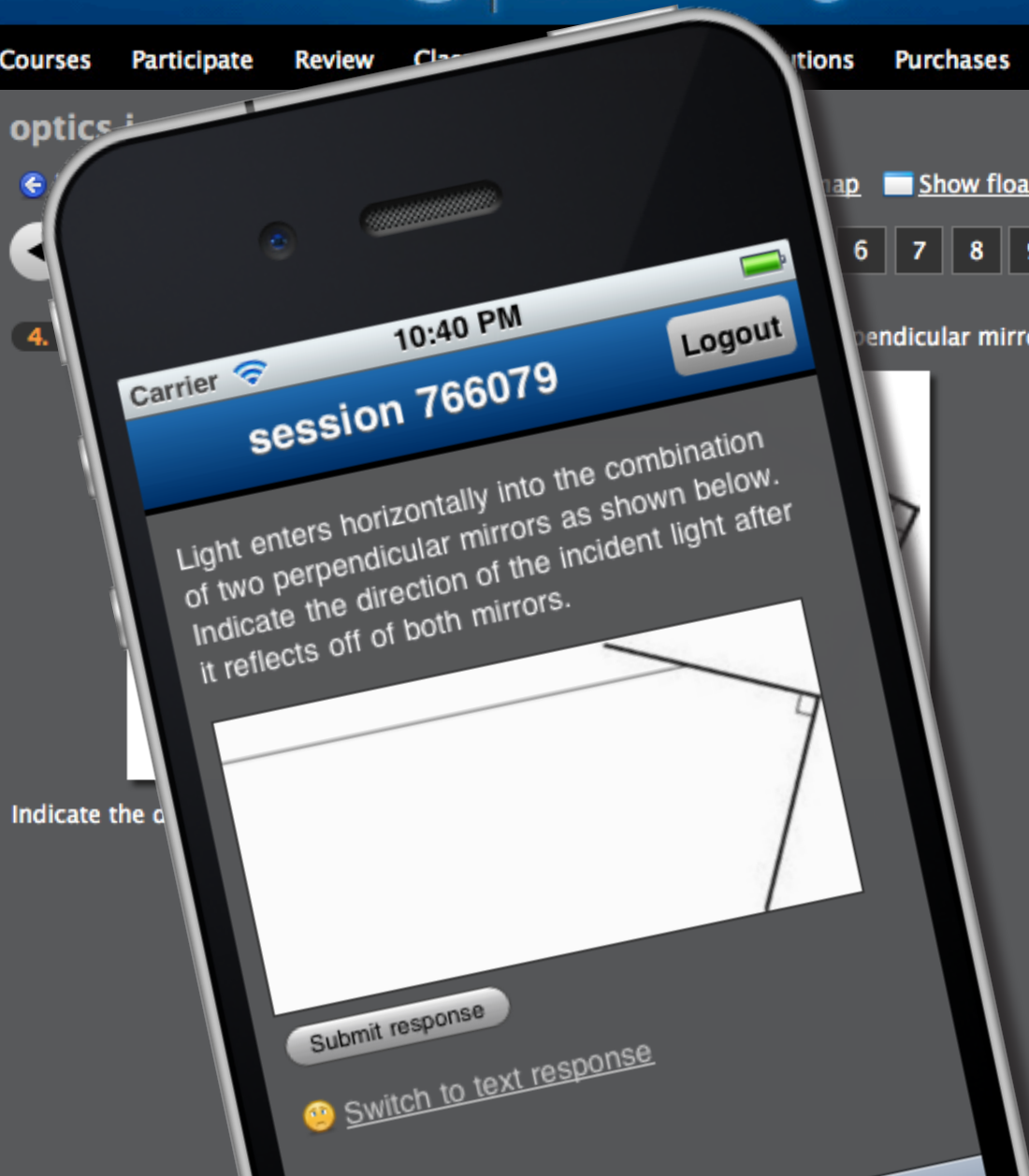
51 responses, 73% correct



✓ 8 get it now
✗ 0 still don't get it



feedback & support



Indicate the d

Dissemination

Fall 2010

software development

Feb 2011

first class use

June 2011

company founded

July 2011

first public demo

August 2011

first customers

December 2012

10k users

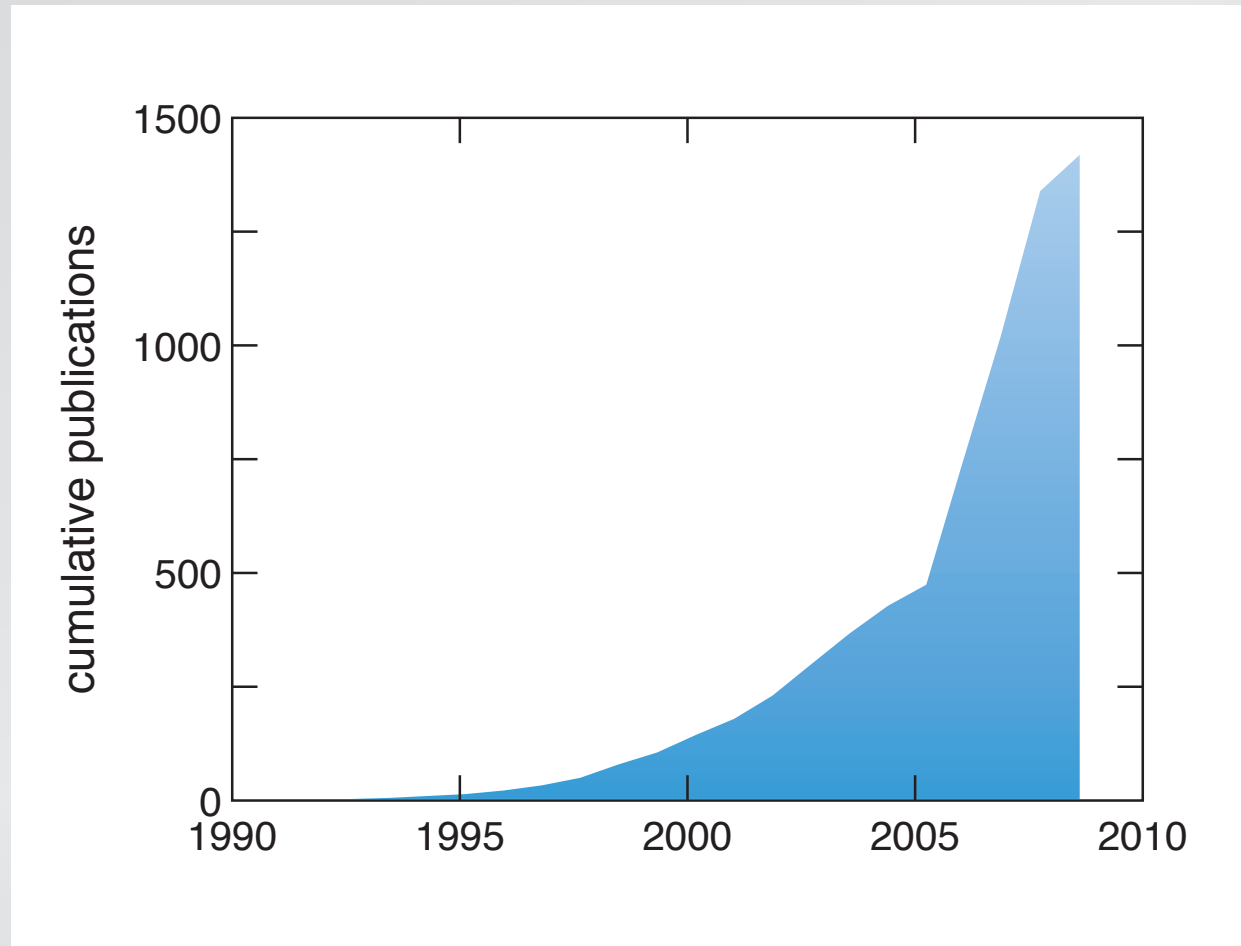
April 2013

acquired by Pearson (2M+ users)

learning | catalytics

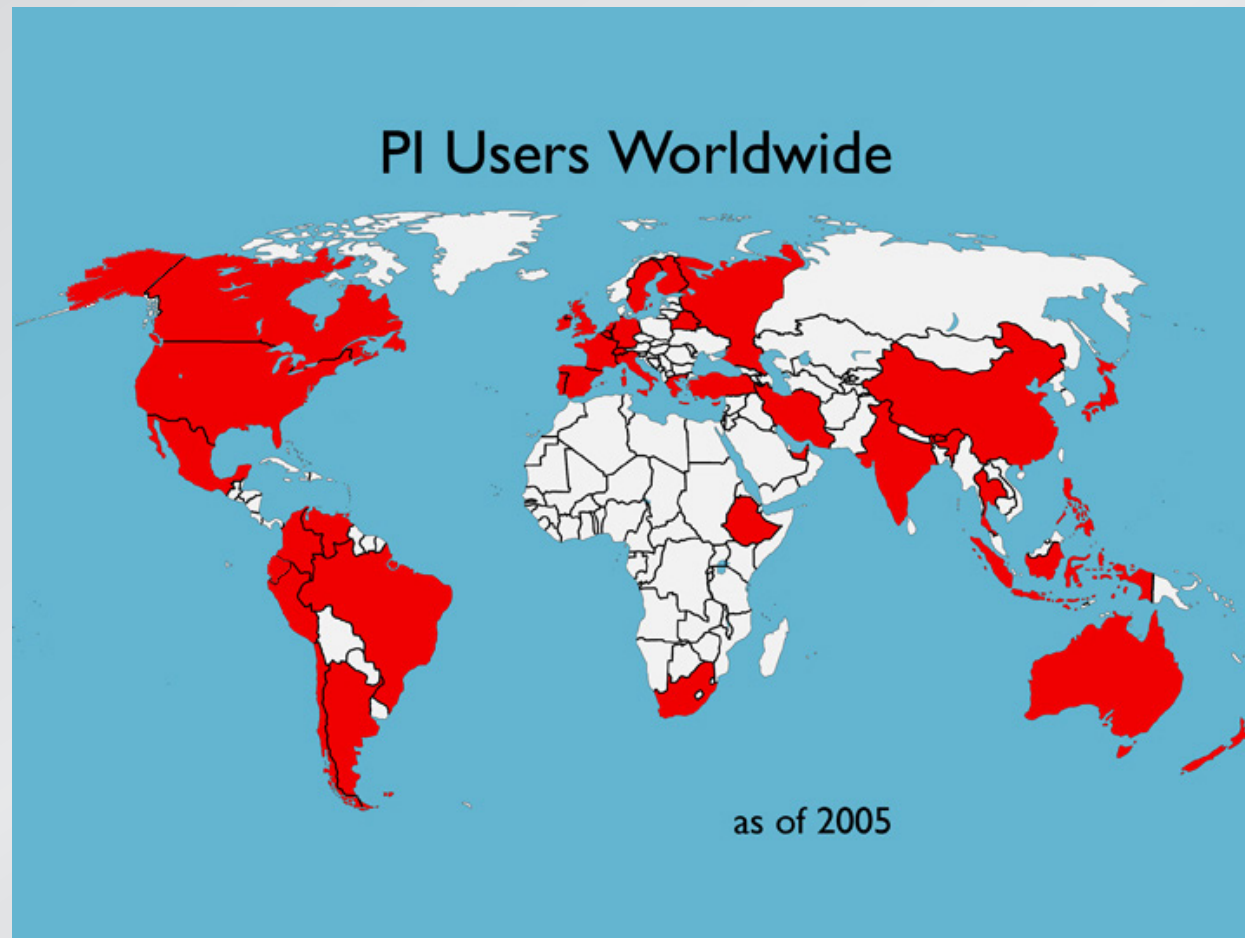
Dissemination

publications mentioning PI



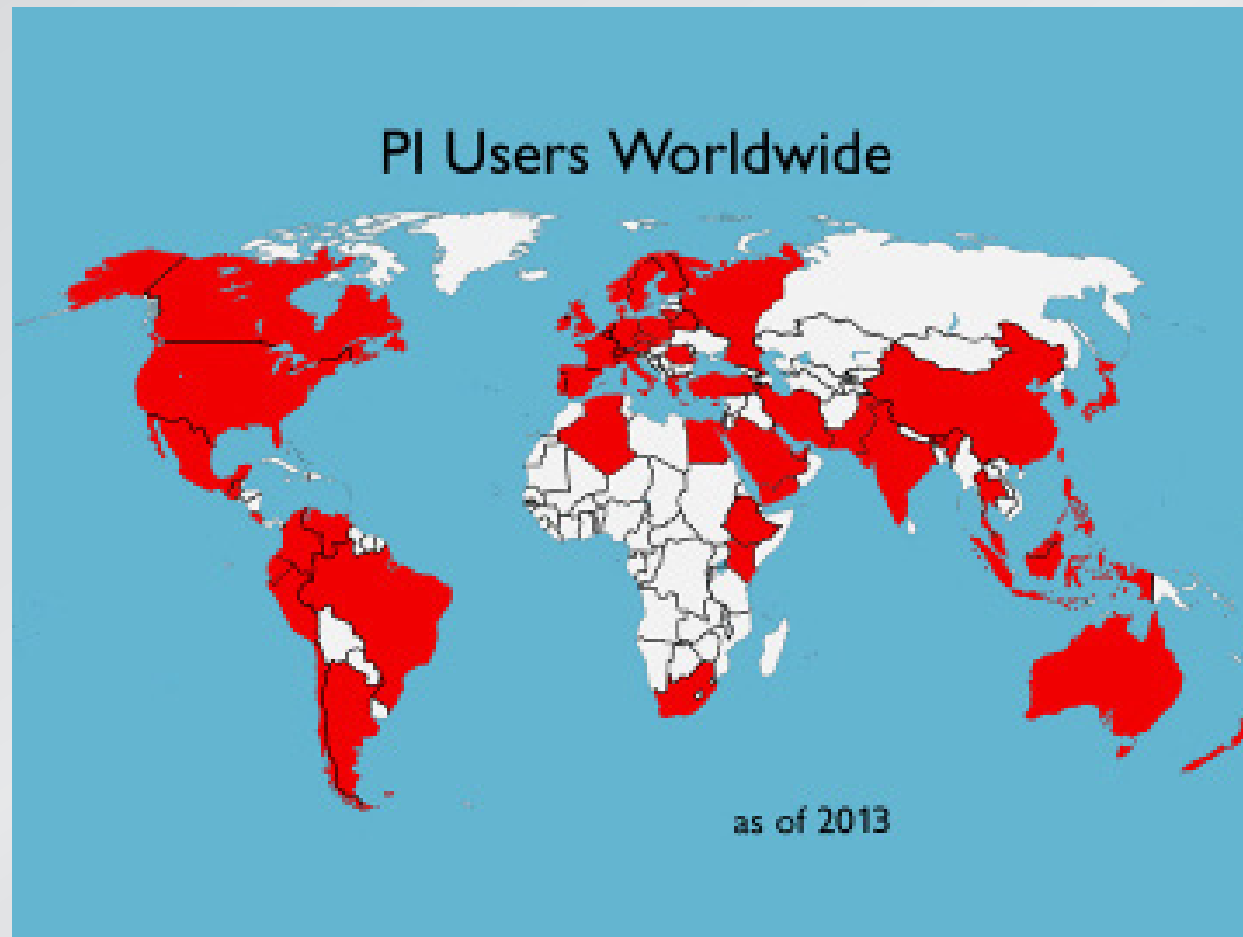
Dissemination

geographic spreading



Dissemination

geographic spreading



Lessons learned

so maybe I had a strategy

Lessons learned

so maybe I had a strategy

I worked on:

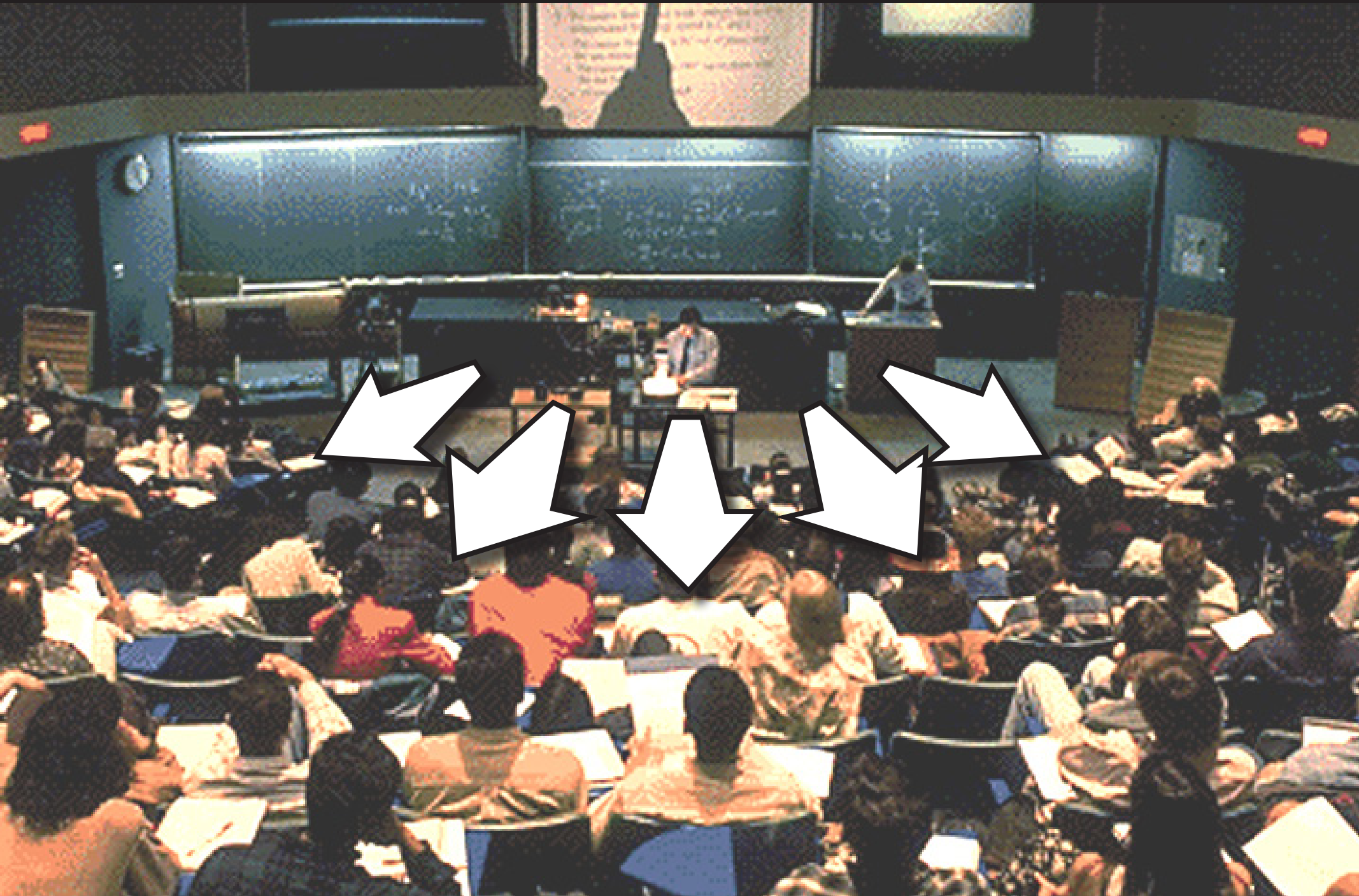
- dissemination
- lowering the threshold
- bridging the divide

Lessons learned

dissemination

- relentlessly focused on one message

Lessons learned



Lessons learned

dissemination

- relentlessly focused on one message
- always told *my* story

Lessons learned

dissemination

- relentlessly focused on one message
- always told *my* story
- always used data

Lessons learned

dissemination

- relentlessly focused on one message
- always told *my* story
- always used data
- avoided jargon

Lessons learned

lowering threshold

- **share material**
- **provide resources**
- **encourage ownership, stress adaptability**

Lessons learned

2/3 of faculty continue to use RBIS

PHYSICAL REVIEW SPECIAL TOPICS - PHYSICS EDUCATION RESEARCH 8, 020104 (2012)

Use of research-based instructional strategies in introductory physics: Where do faculty leave the innovation-decision process?

Charles Henderson

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(Received 20 February 2012; published 31 July 2012)

During the fall of 2008 a web survey, designed to collect information about pedagogical knowledge and practices, was completed by a representative sample of 722 physics faculty across the United States (50.3% response rate). This paper presents partial results to describe how 20 potential predictor variables correlate with faculty knowledge about and use of research-based instructional strategies (RBIS). The innovation-decision process was conceived of in terms of four stages: knowledge versus no knowledge, trial versus no trial, continuation versus discontinuation, and high versus low use. The largest losses occur at the continuation stage, with approximately 1/3 of faculty discontinuing use of all RBIS after trying one or more of these strategies. Nine of the predictor variables were statistically significant for at least one of these stages when controlling for other variables. Knowledge and/or use of RBIS are significantly correlated with reading teaching-related journals, attending talks and workshops related to teaching, attending the physics and astronomy new faculty workshop, having an interest in using more RBIS, being female, being satisfied with meeting instructional goals, and having a permanent, full-time position. The types of variables that are significant at each stage vary substantially. These results suggest that common dissemination strategies are good at creating knowledge about RBIS and motivation to try a RBIS, but more work is needed to support faculty during implementation and continued use of RBIS, but to common assumptions, faculty age, institutional type, and percentage of job related to teaching were not found to be barriers to use of at least some RBIS. High research productivity and large class sizes were found to be barriers to use of at least some RBIS.

PACS numbers: 01.40.Fk, 01.40.gb

Henderson et al., *Phys. Rev. ST Phys. Educ. Res.* 8, 2 (2012)

EPJER 8.020104

bibliography of Ref. [8]—that have been empirically shown to improve student learning in many of the problem areas above. Examples include Peer Instruction Demonstrations [11], Tutorials [12], and Problem Solving Groups [13]. The

Lessons learned

taking the “peer” out of “peer instruction”?

PHYSICS EDUCATION RESEARCH SECTION

All submissions to PERS should be sent (preferably electronically) to the Editorial Office of AJP, and then they will be forwarded to the PERS editor for consideration.

Physics faculty and educational researchers: Divergent expectations as barriers to the diffusion of innovations

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Department of Physics, University of North Carolina at Charlotte, Charlotte, North Carolina 28223

(Received 11 April 2006; accepted 26 September 2007)

Physics Education Research (PER) practitioners have engaged in substantial curriculum development and dissemination work in recent years. Yet, it appears that this work has had minimal influence on the fundamental teaching practices of the typical physics faculty. To better understand this situation, interviews were conducted with five likely users of physics education research. All reported making changes in their instructional practices and all were influenced, to some extent, by educational research. Yet, none made full use of educational research and most had complaints about their interactions with educational researchers. In this paper we examine how these instructors used educational research in making instructional decisions and identify divergent expectations about how researchers and faculty can work together to improve student learning. Although different instructors emphasized different aspects of this discrepancy between expectations, we believe that they are all related to a single underlying issue: the typical dissemination model is to disseminate curricular innovations and have faculty adopt them with minimal changes, while faculty expect researchers to work with them to incorporate research-based knowledge and materials into their unique instructional situations. Implications and recommendations are discussed. © 2008 American Association of Physics Teachers.

[DOI: 10.1119/1.2800352]

Henderson et al., *Am. J. Phys.* 76, 79 (2008)

by educational research. Yet, none made full use of educational research and most had complaints about their interactions with educational researchers. In this paper we examine how these instructors used educational research in making instructional decisions and identify differences in expectations to be barriers to more full use of educational research. We believe that these barriers are not unique to PER. From this study.

Summary



Summary

some suggestions

- **relate to others by describing own experience**
- **use data/scientific approach**
- **let others take ownership**

Funding:

National Science Foundation

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