

Auxiliary Appendix

To accompany C. Henderson, M. Dancy, “The Impact of Physics Education Research on the Teaching of Introductory Quantitative Physics in the United States”

Table of Contents

Appendix A: Additional Results from Web Survey.....	3
Part 1. Respondent Characteristics.....	3
Table 1: Gender by Type of Institution	3
Table 2: Years of Teaching Experience by Type of Institution	3
Table 3: Current Rank by Type of Institution	3
Table 4: Type of Position by Type of Institution	3
Table 5: Type of Quantitative Course Last Taught (or course chosen by instructor to think about during the survey) by Type of Institution.....	4
Table 6: Class Size (for most recently taught course) by Type of Institution.....	4
Table 7: Faculty control over the design of course components.....	4
Table 8: Instructional Goals by Type of Institution	5
Table 9: Satisfaction with extent to which students are meeting their instructional goals for problem solving skills for those respondents rating problem solving skills as very important.....	5
Table 10: Satisfaction with extent to which students are meeting their instructional goals for conceptual understanding of physics content for those respondents rating conceptual understanding of physics content as very important.	5
Table 11: Satisfaction with extent to which students are meeting their instructional goals for attitudes towards and appreciation of physics for those respondents rating attitudes towards and appreciation of physics as very important.....	6
Part 2: Faculty Use of RBIS	7
TABLE 12: Ranking of the 24 RBIS according to percentage of current users of those faculty indicating that they have knowledge of a particular RBIS. Note that many of the rankings are similar. However some, such as TIPERS, are ranked much higher on this list than on level of use (3rd vs. 11th).....	7

TABLE 13: Categorization of open-ended responses to the question “What prevents you from using more of these strategies?”	8
Part 3: Modifications Made to RBIS during Implementation.....	9
Table 14: Instructor use of developer-recommended aspects of Peer Instruction.....	9
Table 15: Instructor use of developer-recommended aspects of Cooperative Group Problem Solving	10
Part 4: Discontinuance of Use.....	11
TABLE 16: Ranking of the 24 RBIS according to percentage of faculty who have discontinued use..	11
TABLE 17: Categorization of open-ended responses (N=74) to the question “Why do you no longer use Cooperative Group Problem Solving?”	12
TABLE 18: Categorization of open-ended responses (N=68) to the question “Why do you no longer use Peer Instruction?”	13
TABLE 19: Categorization of open-ended responses (N=45) to the question “Why do you no longer use Ranking Tasks?”	14
TABLE 20: Categorization of open-ended responses (N=25) to the question “Why do you no longer use Real-Time Physics Labs?”	15
Appendix B: Overview of 24 Research-Based Instructional Strategies Targeted in Web Survey	16
Appendix C: Web Survey Questions	22

Appendix A: Additional Results from Web Survey

Part 1. Respondent Characteristics

Table 1: Gender by Type of Institution

	Female	Male
Two-Year College	20.1%	79.9%
Four-Year College (B.A.)	22.0	78.0
Four-Year College (Grad)	10.9	89.1
All Institutions	17.3	82.7

Table 2: Years of Teaching Experience by Type of Institution

	Total years of faculty teaching experience	Years of teaching experience at current institution
Two-Year College	15.9	11.5
Four-Year College (B.A.)	14.4	11.9
Four-Year College (Grad)	16.0	14.1
All Institutions	15.4	12.7

Table 3: Current Rank by Type of Institution

	Lecturer	Assistant Professor	Associate Professor	Full Professor	Other
Two-Year College	11.7%	9.2%	15.3%	31.3%	32.5%
Four-Year College (B.A.)	3.5	30.0	33.0	30.8	2.6
Four-Year College (Grad)	7.2	20.0	22.0	42.8	8.0
All Institutions	7.0	20.8	24.2	35.6	12.3

Table 4: Type of Position by Type of Institution

	Full-Time, Permanent	Full-Time, Temporary	Part-Time, Permanent
Two-Year College	85.5%	3.3%	11.2%
Four-Year College (B.A.)	88.5	8.0	3.5
Four-Year College (Grad)	85.8	11.3	2.9
All Institutions	86.7	8.1	5.1

Table 5: Type of Quantitative Course Last Taught (or course chosen by instructor to think about during the survey) by Type of Institution

	Algebra-Based	Calculus-Based
Two-Year College	52.2%	47.8%
Four-Year College (B.A.)	34.1	65.9
Four-Year College (Grad)	30.9	69.1
All Institutions	37.5	62.5

Table 6: Class Size (for most recently taught course) by Type of Institution

	Average	Min	Max
Two-Year College	27.8	4	110
Four-Year College (B.A.)	38.0	5	180
Four-Year College (Grad)	132.0	9	800
All Institutions	72.0	4	800

Table 7: Faculty control over the design of course components.

	Lecture			Lab			Recitation/Discussion Section		
	I had primary control	Someone else had primary control	Not applicable (not a course component)	I had primary control	Someone else had primary control	Not applicable (not a course component)	I had primary control	Someone else had primary control	Not applicable (not a course component)
Two-Year College	98.4%	1.1%	0.5%	85.9%	12.0%	2.2%	63.6%	0.5%	35.9%
Four-Year College (B.A.)	97.6	1.2	1.2	59.7	36.3	4.0	50.8	4.9	44.3
Four-Year College (Grad)	97.5	2.2	0.4	21.2	62.4	16.4	53.8	22.5	23.6
All Institutions	97.8	1.5	0.7	51.6	40.1	8.4	55.3	10.6	34.0

Table 8: Instructional Goals by Type of Institution

	Problem Solving Skills			Conceptual Understanding of Physics Content			Attitudes Towards and Appreciation of Physics		
	Not at All Important	Somewhat Important	Very Important	Not at All Important	Somewhat Important	Very Important	Not at All Important	Somewhat Important	Very Important
Two-Year College	1.1%	8.5%	90.4%	0.6%	9.0%	90.4%	2.3%	40.7%	57.1%
Four-Year College (B.A.)	0.9	8.7	90.5	1.3	4.8	93.9	3.4	44.8	51.7
Four-Year College (Grad)	1.2	9.1	89.8	1.2	8.3	90.6	4.0	50.6	45.5
All Institutions	1.1	8.8	90.2	1.1	7.3	91.7	3.3	45.9	50.8

Table 9: Satisfaction with extent to which students are meeting their instructional goals for problem solving skills for those respondents rating problem solving skills as very important.

	Extremely Satisfied	Somewhat Satisfied	Unsure	Somewhat Unsatisfied	Extremely Unsatisfied
Two-Year College	10.7%	68.6%	4.4%	13.2%	3.1%
Four-Year College (B.A.)	4.8	70.7	3.8	18.3	2.4
Four-Year College (Grad)	5.3	61.0	5.7	23.7	4.4
All Institutions	6.6	66.4	4.7	19.0	3.4

Table 10: Satisfaction with extent to which students are meeting their instructional goals for conceptual understanding of physics content for those respondents rating conceptual understanding of physics content as very important.

	Extremely Satisfied	Somewhat Satisfied	Unsure	Somewhat Unsatisfied	Extremely Unsatisfied
Two-Year College	11.9%	63.1%	9.4%	13.8%	1.9%
Four-Year College (B.A.)	6.0	66.7	6.0	18.5	2.8
Four-Year College (Grad)	7.4	56.5	11.3	21.7	3.0
All Institutions	8.1	61.9	8.9	18.5	2.6

Table 11: Satisfaction with extent to which students are meeting their instructional goals for attitudes towards and appreciation of physics for those respondents rating attitudes towards and appreciation of physics as very important.

	Extremely Satisfied	Somewhat Satisfied	Unsure	Somewhat Unsatisfied	Extremely Unsatisfied
Two-Year College	18.8%	47.5%	23.8%	7.9%	2.0%
Four-Year College (B.A.)	7.6	45.4	22.7	21.0	3.4
Four-Year College (Grad)	10.4	36.5	27.8	16.5	8.7
All Institutions	11.9	43.0	24.8	15.5	4.8

Part 2: Faculty Use of RBIS

TABLE 12: Ranking of the 24 RBIS according to percentage of current users of those faculty indicating that they have knowledge of a particular RBIS. Note that many of the rankings are similar to those of use. However some, such as TIPERS, are ranked much higher on this list than on level of use (3rd vs. 11th).

RBIS	All Institutions	Two-Year College	Four-Year College (B.A.)	Four-Year College (Grad)
Peer Instruction	46.0%	40.7%	51.1%	43.2%
Ranking Tasks	39.9	55.1	33.7	31.9
TIPERS: Tasks Inspired by Physics Education Research	31.9	46.3	21.2	24.1
Interactive Lecture Demonstrations	30.7	32.9	35.3	22.3
Cooperative Group Problem Solving	27.8	27.8	25.9	30.3
Context Rich Problems	27.4	25.0	28.9	27.1
Experiment Problems	23.2	34.1	13.3	21.7
Physlets	23.1	29.2	22.0	19.5
Real Time Physics Labs	22.5	29.2	21.8	15.8
Just in Time Teaching	17.7	15.6	19.2	17.3
Active Learning Problem Sheets	17.2	23.8	15.9	13.2
Tutorials in Introductory Physics	16.7	15.1	21.4	12.1
Video Lab	16.5	20.5	20.4	6.1
Workshop Physics	14.0	10.6	20.0	5.8
Activity Based Problem Tutorials	14.0	18.9	17.6	4.6
Socratic Dialogue Inducing Labs	11.4	17.2	6.8	12.5
Modeling	9.7	17.7	6.2	7.5
SCALE-UP	9.6	4.8	12.1	8.2
Open Source Physics	8.6	12.1	4.8	11.4
Open Source Tutorials	8.0	20.0	0.0	10.4
Investigative Science Learning Environment	7.5	13.6	6.3	2.5
Thinking Problems	7.2	17.2	2.7	3.2
Overview Case Study Physics	7.0	9.1	5.8	6.4
Workbook for Introductory Physics	4.7	6.3	3.4	5.4

TABLE 13: Categorization of open-ended responses to the question “What prevents you from using more of these strategies?”. Note that this question was only asked of the 70.2% of respondents who indicated that they were interested in using more RBIS.

	All	2YC	BA	Grad
TIME				
Time to learn about and implement changes	28.6%	31.9%	34.6%	19.6%
Time (not elaborated)	24.1	19.8	24.7	27.3
LACK OF KNOWLEDGE ABOUT/ ACCESS to RBIS				
Lack of familiarity with many RBIS	22.4	30.2	18.5	21.0
Lack of access to RBIS	3.1	2.6	3.1	3.5
WEAKNESSES OF RBIS				
Difficult to cover material (uses too much class time)	8.0	8.6	6.8	9.1
Not convinced of benefit	6.6	2.6	9.3	7.0
Requires too much instructor time to use	2.4	3.4	1.9	2.1
Student resistance (real or perceived)	2.1	0.9	3.1	2.1
Lack of ready-to-use materials	0.7	1.7	0.0	0.7
LACK OF MOTIVATION TO ADOPT RBIS (other than TIME)				
I don't follow one method, but adapt pieces of many to fit my teaching style.	6.1	4.3	6.2	7.7
Nothing	1.9	0.9	1.2	3.5
Inertia	1.2	1.7	1.2	0.7
LACK OF FIT WITH DEPARTMENT OR INSTITUTION				
Cost to implement (e.g., lab equipment, additional staff)	4.0	4.3	5.6	2.1
Need to coordinate changes with colleagues	3.8	0.0	3.1	7.7
Lack of appropriate classroom space/class scheduling	3.7	0.9	2.5	7.7
Cost (not elaborated)	2.6	4.3	1.9	2.1
Colleagues would not approve	2.1	0.9	2.5	2.8
Cost for students (e.g., books, clickers)	0.7	2.6	0.0	0.0
UNCLEAR				
Unclear response	4.7	3.4	4.3	6.3

Part 3: Modifications Made to RBIS during Implementation

Table 14: Instructor use of developer-recommended aspects of Peer Instruction.

Table represents all self-described users of Peer Instruction. Respondents are broken into four categories based on their self-described degree of modification of Peer Instruction. Percentages reported are the percentage of respondents within a particular category.

	Components of Peer Instruction								
	All Peer Instruction Users	Traditional Lecture (for nearly Every Class or multiple times every class)	Students discuss ideas in small groups (multiple times every class)	Students solve/discuss qualitative/conceptual problem (multiple times every class)	Whole class voting (multiple times every class)	Conceptual questions (used on all tests)	Uses all 5 components	Uses 4 of the 5 components	Uses 3 of the 5 components
1. I used it basically as described by developer	16.9%	53.1%	28.1%	25.0%	50.0%	68.8%	6.3%	18.8%	18.8%
2. I made some relatively minor modifications	35.9	47.8	33.3	30.4	40.6	69.6	7.2	14.5	14.5
3. I used some of the ideas, but made significant modifications	41.0	62.0	24.1	27.8	36.7	63.3	6.3	15.2	13.9
4. I am not familiar enough with the developer's description to answer the question	6.2	72.7	18.2	9.1	9.1	36.4	0.0	9.1	0.0
All Peer Instruction Users	100.0	54.9	27.2	26.7	37.9	63.6	6.2	14.9	13.8

Table 15: Instructor use of developer-recommended aspects of Cooperative Group Problem Solving. Table represents all self-described users of Cooperative Group Problem Solving. Respondents are broken into four categories based on their self-described degree of modification of Cooperative Group Problem Solving. Percentages reported are the percentage of respondents within a particular category.

	Components of Cooperative Group Problem Solving								
	All Cooperative Group Problem Solving Users	Traditional Lecture (for nearly Every Class or multiple times every class)	Instructor Solves/discusses quantitative/mathematical problem (for nearly Every Class or multiple times every class)	Students solve/discuss quantitative/mathematical problem (for nearly Every Class or multiple times every class)	Novel problems (used on all tests)	Questions that require students to explain their reasoning (used on all tests)	Uses all 5 components	Uses 4 of the 5 components	Uses 3 of the 5 components
1. I used it basically as described by developer	8.3%	85.7%	42.9%	28.6%	14.3%	28.6%	0.0%	28.6%	0.0%
2. I made some relatively minor modifications	16.7	53.3	60.0	53.3	6.7	40.0	0.0	13.3	26.7
3. I used some of the ideas, but made significant modifications	47.9	37.8	48.9	42.2	17.8	42.2	2.2	8.9	26.7
4. I am not familiar enough with the developer's description to answer the question	27.1	64.0	76.0	56.0	8.0	28.0	0.0	20.0	28.0
All Cooperative Group Problem Solving Users	100.0	45.8	55.2	44.8	12.5	35.4	1.0	13.5	24.0

Part 4: Discontinuance of Use

TABLE 16: Ranking of the 24 RBIS according to percentage of faculty who have discontinued use. Discontinuance of a RBIS is calculated by dividing the number of former users by the number of former plus current users.

RBIS	All Institutions	Two-Year College	Four-Year College (B.A.)	Four-Year College (Grad)
TIPERS: Tasks Inspired by Physics Education				
Research	27.1%	19.4%	42.1%	22.2%
Peer Instruction	32.3	28.3	31.0	35.4
Ranking Tasks	39.3	28.3	46.0	45.0
Experiment Problems	40.9	28.6	57.1	44.4
Interactive Lecture Demonstrations	41.1	46.7	37.7	41.7
Video Lab	41.2	11.1	52.4	50.0
Real Time Physics Labs	43.4	40.6	42.4	50.0
Context Rich Problems	43.8	35.3	40.0	51.3
Active Learning Problem Sheets	48.0	40.0	53.3	50.0
Socratic Dialogue Inducing Labs	50.0	28.6	70.0	42.9
Just in Time Teaching	51.7	57.1	52.8	45.7
Physlets	53.8	47.2	58.8	53.1
Cooperative Group Problem Solving	54.3	56.0	56.8	50.0
Open Source Physics	55.6	50.0	70.0	44.4
Thinking Problems	58.8	28.6	85.7	66.7
Activity Based Problem Tutorials	59.6	46.2	55.1	83.3
Tutorials in Introductory Physics	61.2	67.6	54.1	66.7
SCALE-UP	61.7	75.0	57.1	64.7
Workshop Physics	63.8	72.7	52.9	81.5
Open Source Tutorials	64.5	33.3	100.0	58.3
Modeling	70.7	60.7	80.0	70.6
Investigative Science Learning Environment	71.8	60.0	77.8	83.3
Overview Case Study Physics	75.0	77.3	75.0	70.0
Workbook for Introductory Physics	80.0	75.0	84.6	77.8

TABLE 17: Categorization of open-ended responses (N=74) to the question “Why do you no longer use Cooperative Group Problem Solving?”.

	N	Example Response
Took too much class time	15	Not enough time left over for instruction
Did not work	14	I don't find it effective in teaching problem solving
Do use, but with significant modifications	10	I do use it, but I have adapted heavily for my class--it is not in its original/named form.
Do use, but only occasionally	8	I use the technique occasionally each term.
I am trying other things right now	5	Trying out different strategies.
Does not work with my class size or structure	4	I use it for small class sizes (<=30) but not larger classes.
Department did not support use	4	Lack of interest in the department.
Not comfortable with the method	2	I never felt proficient at getting the students to be effective learners using the approach.
Not enough materials available	2	Difficulty in coming up with enough good problems.
Other/Unclear	10	It is a supplemental component of the course that I teach.

TABLE 18: Categorization of open-ended responses (N=68) to the question “Why do you no longer use Peer Instruction?”.

	N	Example Response
Did not work	13	Our college physics students actually seem to be harmed by such discussions or else the discussions need to be more carefully guided.
Do use, but with significant modifications	8	I currently use some of the ideas, but have made my own modifications.
I am trying other things right now	7	Currently experimenting with other techniques. Will probably return to it in the future.
Took too much class time	6	Takes too much time.
My class size is too small	6	Class too small.
Clicker issues	6	Students complain about the cost of the clicker system.
Department did not support use	4	Not encouraged by the department and the students hated that.
Do use, but only occasionally	2	I use it occasionally in class or recitation, when I have the time to use it.
Not enough materials available	2	I use some similar questions, but haven't developed enough that fit well with the textbook that I'm using.
Other/Unclear	14	I've made a decision to stick with the traditional format for the time being.

TABLE 19: Categorization of open-ended responses (N=45) to the question “Why do you no longer use Ranking Tasks?”.

	N	Example Response
Did not work	9	Did not see much change in knowledge gained by students using this approach.
Do use, but only occasionally	9	I still use it but not too much.
Do use, but with significant modifications	5	I still use the idea incorporated into other teaching strategies.
I am trying other things right now	5	No good reason. Doing other things instead, I guess. I think they can be valuable
Took too much class time	5	It was not productive given the time constraints of our course (3-50 minute lectures per week, no discussion or recitation sections). They are inconsistent with the way I currently evaluate students. I am currently teaching one of three sections and we have common exams, so I need to allow more time for analytical problem solving rather than ranking tasks.
Not appropriate for current course	4	
Other/Unclear	8	Extra cost was prohibitive to students.

TABLE 20: Categorization of open-ended responses (N=25) to the question “Why do you no longer use Real-Time Physics Labs?”.

	N	Example Response
Do use, but with significant modifications	6	We have adapted several of the Real Time Physics experiments, but the entire set of workbooks included a lot of material we didn't use.
Did not work	6	It is not as effective. For students who still have problems with basic mathematics, it will look like toys and actually they do not learn much from it.
Not appropriate for current course	4	Not appropriate for my small sections.
I am trying other things right now	2	Have developed my own lab curriculum informed by PER.
Department did not support use	2	At my old institution, we started using Real Time Physics in 2001. They are still using RTP there, but at my new institution my colleagues are not ready for RTP.
Other/Unclear	5	Insufficient equipment

Appendix B: Overview of 24 Research-Based Instructional Strategies Targeted in Web Survey*

Research-Based Instructional Strategy	Literature Reference	Web Reference
Active Learning Problem Sheets	<ul style="list-style-type: none"> • Alan Van Heuvelen, <i>ALPS Kit: Active Learning Problem Sheets</i>. (Hayden-McNeil, Plymouth, Michigan, 1990). • Alan Van Heuvelen and Eugenia Etkina, <i>The Physics Active Learning Guide</i>. (Pearson Education, Inc., San Francisco, 2006). 	http://www.pearsonhighered.com/educator/academic/product/0,,0805390782,00%2ben-USS_01DBC.html
Activity-Based Physics Tutorials	<ul style="list-style-type: none"> • Michael C. Wittmann, Richard N. Steinberg, Edward F. Redish, <i>Activity Based Physics Tutorials</i>. (Wiley, New York, 2004). 	http://perlnet.umephy.maine.edu/abt/index.html
Context-Rich Problems	<ul style="list-style-type: none"> • P. Heller and M. Hollabaugh, "Teaching problem solving through cooperative grouping. Part 2: Designing problems and structuring groups.," <i>American Journal of Physics</i> 60, 637-645 (1992). 	http://groups.physics.umn.edu/physed/Research/CRP/crintro.html
Cooperative Group Problem Solving	<ul style="list-style-type: none"> • P. Heller, T. Foster, and K. Heller, "Cooperative group problem solving laboratories for introductory classes", in <i>The Changing Role of Physics Departments in Modern Universities: Proceedings of the International Conference on Undergraduate Physics Education</i>, edited by E. F. Redish and J. S. Rigden (American Institute of Physics, Woodbury, NY, 1996), pp. 913-934. • P. Heller and K. Heller, <i>Cooperative group problem solving in physics</i>. (University of Minnesota preprint, 1999). 	http://groups.physics.umn.edu/physed/Research/CGPS/CGPSintro.htm
Experiment Problems	<ul style="list-style-type: none"> • Alan Van Heuvelen, Leith Allen, and Pavlos Mihas, "Experiment Problems for 	

* Note that the web survey also asked participants about their knowledge about and use of Web-based homework/tutoring and Research-based textbooks. Results of these questions are not reported here.

	Electricity and Magnetism," The Physics Teacher 37 (8), 482-485 (1999).	
Interactive Lecture Demonstrations	<ul style="list-style-type: none"> • David R. Sokoloff and Ronald K. Thornton, "Using Interactive Lecture Demonstrations to Create an Active Learning Environment," The Physics Teacher 35 (6), 340-342 (1997). 	http://ase.tufts.edu/csmt/html/abstracts/physteach.html
Investigative Science Learning Environment	<ul style="list-style-type: none"> • Alan Van Heuvelen and Eugenia Etkina, <i>The Physics Active Learning Guide</i>. (Addison-Wesley, San Francisco, 2006). • E. Etkina and A. Van Heuvelen, "Investigative Science Learning Environment - A Science Process Approach to Learning Physics," in <i>Research-Based Reform of University Physics</i>, edited by E. F. Redish and P. J. Cooney (American Association of Physics Teachers, College Park, MD, 2007), Reviews in PER Vol. 1, <http://www.per-central.org/document/ServeFile.cfm?ID=4988>. 	http://www.islephysics.net/
Just-In-Time Teaching	<ul style="list-style-type: none"> • Gregor M. Novak, Evelyn T. Patterson, Andrew D. Gavrin, and Wolfgang Christian, <i>Just-in-time teaching: Blending active learning with web technology</i>. (Prentice Hall, Upper Saddle River, NJ, 1999). 	http://jittdl.physics.iupui.edu/jitt/
Modeling Physics	<ul style="list-style-type: none"> • D. Hestenes, "Modeling Games in the Newtonian World," American Journal of Physics 60, 732-748 (1992). 	http://modeling.la.asu.edu/
Open Source Physics	<ul style="list-style-type: none"> • Wolfgang Christian, <i>Open Source Physics: A User's Guide with Examples</i>. (Addison Wesley, San Francisco, 2006). 	http://www.compadre.org/osp/
Open Source Tutorials		http://www2.physics.umd.edu/~elby/CC/LI/index.html

Overview, Case Study Physics	<ul style="list-style-type: none"> • A. Van Heuvelen, "Overview, case study physics," <i>American Journal of Physics</i> 59, 898-907 (1991). 	
Peer Instruction	<ul style="list-style-type: none"> • Eric Mazur, <i>Peer instruction: A user's manual</i>. (Prentice Hall, Upper Saddle River, New Jersey, 1997). • C. H. Crouch, J. Watkins, A. P. Fagen, and E. Mazur, "Peer Instruction: Engaging Students One-on-One, All At Once," in <i>Research-Based Reform of University Physics</i>, edited by E. F. Redish and P. J. Cooney (American Association of Physics Teachers, College Park, MD, 2007), Reviews in PER Vol. 1, <http://www.per-central.org/document/ServeFile.cfm?ID=4990>. 	http://mazor-www.harvard.edu/education/educationmenu.php
Physlets	<ul style="list-style-type: none"> • Wolfgang Christian and Mario Belloni, <i>Physlet Physics: Interactive Illustrations, Explorations, and Problems for Introductory Physics</i>. (Pearson Education, Upper Saddle River, New Jersey, 2004). • Wolfgang Christian and Mario Belloni, <i>Physlets: Teaching physics with interactive curricular material</i>. (Prentice Hall, Upper Saddle River, New Jersey, 2001). 	http://webphysics.davidson.edu/Applets/Applets.html
Ranking Tasks	<ul style="list-style-type: none"> • Tom O'Kuma, David P. Maloney, and Curtis J. Hieggelke, <i>Ranking Task Exercises in Physics: A User's Manual</i>. (Prentice Hall, Upper Saddle River, NJ, 1999). 	http://www.compadre.org/PSRC/items/detail.cfm?ID=3686
Real Time Physics/Tools for Scientific Thinking Labs	<ul style="list-style-type: none"> • R. Thornton and D.R. Sokoloff, "Learning Motion Concepts Using Real-Time Microcomputer-Based Laboratory Tools," <i>American Journal of Physics</i> 58 (9), 858-867 (1990). 	http://ase.tufts.edu/csmt/html/abstracts/icupe_rtp.html

Scale-Up, Studio Physics	<ul style="list-style-type: none"> • R. Beichner, L. Bernold, E. Burniston, P. Dail, R. Felder, J. Gastineau, M. Gjertsen, and J. Risley, "Case study of the physics component of an integrated curriculum," <i>American Journal of Physics</i> 67 (7), S16-S24 (1999). • R. J. Beichner, J. M. Saul, D. S. Abbott, J. J. Morse, D. L. Deardorff, R. J. Allain, S. W. Bonham, M. H. Dancy, and J. S. Risley, "The Student-Centered Activities for Large Enrollment Undergraduate Programs (SCALE-UP) project," in <i>Research-Based Reform of University Physics</i>, edited by E. F. Redish and P. J. Cooney (American Association of Physics Teachers, College Park, MD, 2007), Reviews in PER Vol. 1, <http://www.per-central.org/document/ServeFile.cfm?ID=4517>. • J. Wilson, "The CUPLE Physics Studio," <i>The Physics Teacher</i> 32 (12), 518-522 (1994). 	http://scaleup.ncsu.edu/
Socratic Dialogueue Inducing labs	<ul style="list-style-type: none"> • R.R. Hake, "Socratic Pedagogy in the Introductory Physics Lab," <i>The Physics Teacher</i> 30, 546-550 (1992). 	http://media4.physics.indiana.edu/~sdi/
Thinking Problems		http://www.physics.umd.edu/perg/problems.htm

TIPERS	<ul style="list-style-type: none"> • Curtis J. Hieggelke, David P. Maloney, Stephen E. Kanim, and Thomas L. O’Kuma, <i>E&M TIPERS: Electricity & Magnetism Tasks Inspired by Physics Education Research</i>. (Prentice Hall, Upper Saddle River, NJ, 2006). • Tom O’Kuma, David P. Maloney, and Curtis J. Hieggelke, <i>Ranking Task Exercises in Physics: A User’s Manual</i>. (Prentice Hall, Upper Saddle River, NJ, 1999). • A. Van Heuvelen and David Maloney, "Playing Physics Jeopardy," <i>American Journal of Physics</i> 67, 252-256 (1999). 	http://tycphysics.org/tipers.htm
Tutorials in Introductory Physics	<ul style="list-style-type: none"> • L. McDermott and P. S. Shaffer, <i>Tutorials in introductory physics</i>. (Prentice Hall, Upper Saddle River, NJ, 2002). 	http://www.phys.washington.edu/groups/peg/tut.html
Video-Based Labs	<ul style="list-style-type: none"> • R. Beichner and David S. Abbott, "Video-Based Labs for Introductory Physics Courses: Analyzing and Graphing Motion on Video," <i>Journal of College Science Teaching</i> 29 (3), 101-104 (1999). • D. Zollman and R. Fuller, "Teaching and learning physics with interactive video," <i>Physics Today</i> 47 (4), 41-47 (1994). 	http://www.ncsu.edu/PER/Articles/jcst9_911_101.pdf http://perg.phys.ksu.edu/dvi/pt/intvideo.html
Workbook for Introductory Physics	<ul style="list-style-type: none"> • David E. Meltzer and Kandiah Manivannan, "Transforming the lecture-hall environment: The fully interactive physics lecture," <i>American Journal of Physics</i> 70, 639-654 (2002). 	http://physicseducation.net/index.html

Workshop Physics	<ul style="list-style-type: none">• P. W. Laws, "Calculus-Based Physics Without Lectures," <i>Physics Today</i> 44 (12), 24-31 (1991).• P. W. Laws, <i>Workshop Physics Activity Guide</i>. (John Wiley & Sons, New York, 1997).	http://physics.dickinson.edu/wp_web/WP_homepage.html
------------------	--	---

Appendix C: Web Survey Questions

- q1.0 Have you taught an algebra- or calculus-based introductory quantitative physics course in the last two years (this academic year and the previous one)?
1 = No
2 = Yes
[* if no, survey ends]
- q2.0 Which best describes your institution?
1 = Four-Year College or University
2 = Two-Year College
- q3.0 Which best describes your current position?
1 = Full-Time, Permanent
2 = Full-Time, Temporary
3 = Part-Time, Permanent
4 = Part-Time, Temporary
[* if Part-Time, Temporary, survey ends]
- q.0 Informed consent
1 = Agree
2 = Decline
[* if Decline, survey ends]
- q4.0 Approximately how many total semesters or terms have you taught an introductory quantitative physics course? (Do not include any experience as a teaching assistant.)
1 = 1-4 semesters or terms
2 = 5-10 semesters or terms
3 = more than 10 semesters or terms

For the next set of questions please think about the LAST time you taught an introductory quantitative course ... (If you taught more than one simultaneously, think about one particular course.)

- q5.0. Was the course algebra-based or calculus-based?
1 = algebra-based
2 = calculus-based
- q6.0 How many students were in this course?
[number of students]
- q7.0 How many lecture sections of this course are typically offered by your department each semester or term (whether taught by you or other instructors)?
[number of sections]

To what extent did you have control over the design of these course components?

q8.0 Lecture

- 1 = I had primary control
- 2 = Someone else had primary control
- 3 = Not applicable (not a course component)

q8.1 Lab

- 1 = I had primary control
- 2 = Someone else had primary control
- 3 = Not applicable (not a course component)

q8.2 Recitation/Discussion Section

- 1 = I had primary control
- 2 = Someone else had primary control
- 3 = Not applicable (not a course component)

q8.3 Homework

- 1 = I had primary control
- 2 = Someone else had primary control
- 3 = Not applicable (not a course component)

q8.4 Testing

- 1 = I had primary control
- 2 = Someone else had primary control
- 3 = Not applicable (not a course component)

q8.5 Grading

- 1 = I had primary control
- 2 = Someone else had primary control
- 3 = Not applicable (not a course component)

q9.0 Is your department generally encouraging about efforts to improve instruction?

- 1 = Very encouraging
- 2 = Somewhat encouraging
- 3 = Neither encouraging nor discouraging
- 4 = Somewhat discouraging
- 5 = Very discouraging

Please indicate your level of familiarity with each of the research-based instructional strategies listed below. [The priorities indicate the hierarchy for the follow-up questions for follow-up questions for “1 = I currently use all or part of it” and “2 = I have used all or part of it in the past”]

q10.0 Cooperative Group Problem Solving (Heller & Heller)

1st priority

- 1 = I currently use all or part of it
- 2 = I have used all or part of it in the past
- 3 = I am familiar with it, but have never used it
- 4 = I've heard the name, but do not know much else about it
- 5 = I have never heard of it

- q10.1 Investigative Science Learning Environment (Etkine & Van Heuvelen) **4th priority**
 1 = I currently use all or part of it
 2 = I have used all or part of it in the past
 3 = I am familiar with it, but have never used it
 4 = I've heard the name, but do not know much else about it
 5 = I have never heard of it
- q10.2 Modeling Physics (Hestenes & Wells) **2nd priority**
 1 = I currently use all or part of it
 2 = I have used all or part of it in the past
 3 = I am familiar with it, but have never used it
 4 = I've heard the name, but do not know much else about it
 5 = I have never heard of it
- q10.3 Overview, Case Study Physics (Van Heuvelen) **5th priority**
 1 = I currently use all or part of it
 2 = I have used all or part of it in the past
 3 = I am familiar with it, but have never used it
 4 = I've heard the name, but do not know much else about it
 5 = I have never heard of it
- q10.4 Scale-Up, Studio Physics (Beichner, Wilson) **3rd priority**
 1 = I currently use all or part of it
 2 = I have used all or part of it in the past
 3 = I am familiar with it, but have never used it
 4 = I've heard the name, but do not know much else about it
 5 = I have never heard of it
- q10.5 Workbook for Intro. Phys. (Meltzer et al) **7th priority**
 1 = I currently use all or part of it
 2 = I have used all or part of it in the past
 3 = I am familiar with it, but have never used it
 4 = I've heard the name, but do not know much else about it
 5 = I have never heard of it
- q10.6 Workshop Physics (Laws) **6th priority**
 1 = I currently use all or part of it
 2 = I have used all or part of it in the past
 3 = I am familiar with it, but have never used it
 4 = I've heard the name, but do not know much else about it
 5 = I have never heard of it

The next two questions (q11.0.x and q12.0.x) are follow-ups for the highest priority RBIS that the respondent is currently using. The x indicates which strategy is being addressed using the last digit in q10.x.

- q11.0.x How long have you used all or part of [x strategy from above]?
- 1 = Less than one semester or term
 2 = One semester or term
 3 = More than one semester or term

q12.0.x To what extent did you modify the instructional strategy of [x strategy from above]?

- 1 = I used it basically as described by the developer.
- 2 = I made some relatively minor modifications.
- 3 = I used some of the ideas, but made significant modifications.
- 4 = I am not familiar enough with the developer's description to answer this question.

The next two questions (q13.0.x and q14.0.x) are follow-ups for the highest priority RBIS that the respondent has used in the past. The x indicates which strategy is being addressed using the last digit in q10.x.

q13.0.x How long have you used all or part of [strategy x from above] in the past?

- 1 = Less than one semester or term
- 2 = One semester or term
- 3 = More than one semester or term

q14.0.x Why do you no longer use [strategy x from above]?
[response]

Please indicate your level of familiarity with each of the research-based instructional strategies listed below. (Specific Strategies for Lecture, Recitation or Homework) [The priorities indicate the hierarchy for the follow-up questions for follow-up questions for "1 = I currently use all or part of it" and "2 = I have used all or part of it in the past"]

q15.0 Active Learning Problem Sheets (Van Heuvelen)

5th priority

- 1 = I currently use all or part of it
- 2 = I have used all or part of it in the past
- 3 = I am familiar with it, but have never used it
- 4 = I've heard the name, but do not know much else about it
- 5 = I have never heard of it

q15.1 Activity-Based Physics Tutorials (Cooney, Cummings, Laws, Sokoloff, Thornton, & Redish)

6th priority

- 1 = I currently use all or part of it
- 2 = I have used all or part of it in the past
- 3 = I am familiar with it, but have never used it
- 4 = I've heard the name, but do not know much else about it
- 5 = I have never heard of it

q15.2 Interactive Lecture Demonstrations (Thornton & Sokoloff)

2nd priority

- 1 = I currently use all or part of it
- 2 = I have used all or part of it in the past
- 3 = I am familiar with it, but have never used it
- 4 = I've heard the name, but do not know much else about it
- 5 = I have never heard of it

q15.3 Just-In-Time Teaching (Novak, Patterson, Gavrin, & Christian)

4th priority

- 1 = I currently use all or part of it
- 2 = I have used all or part of it in the past
- 3 = I am familiar with it, but have never used it
- 4 = I've heard the name, but do not know much else about it
- 5 = I have never heard of it

q15.4 Open Source Tutorials (Elby, Redish, Hammer, Vokos, Rosenberg, & Scherr) 7th priority

- 1 = I currently use all or part of it
- 2 = I have used all or part of it in the past
- 3 = I am familiar with it, but have never used it
- 4 = I've heard the name, but do not know much else about it
- 5 = I have never heard of it

q15.5 Peer Instruction (Mazur) 1st priority

- 1 = I currently use all or part of it
- 2 = I have used all or part of it in the past
- 3 = I am familiar with it, but have never used it
- 4 = I've heard the name, but do not know much else about it
- 5 = I have never heard of it

q15.6 Tutorials in Intro. Physics (McDermott) 3rd priority

- 1 = I currently use all or part of it
- 2 = I have used all or part of it in the past
- 3 = I am familiar with it, but have never used it
- 4 = I've heard the name, but do not know much else about it
- 5 = I have never heard of it

q15.7 Web-base homework/tutoring (e.g., CAPA; Mastering Physics; OWL; UT-Austin; WebAssign)

- 1 = I currently use all or part of it
- 2 = I have used all or part of it in the past
- 3 = I am familiar with it, but have never used it
- 4 = I've heard the name, but do not know much else about it
- 5 = I have never heard of it

The next two questions (q16.0.x and q17.0.x) are follow-ups for the highest priority RBIS that the respondent is currently using. The x indicates which strategy is being addressed using the last digit in q15.x.

q16.0.x How long have you used all or part of [x strategy from above]?

- 1 = Less than one semester or term
- 2 = One semester or term
- 3 = More than one semester or term

q17.0.x To what extent did you modify the instructional strategy of [x strategy from above]?

- 1 = I used it basically as described by the developer.
- 2 = I made some relatively minor modifications.
- 3 = I used some of the ideas, but made significant modifications.
- 4 = I am not familiar enough with the developer's description to answer this question.

The next two questions (q18.0.x and q19.0.x) are follow-ups for the highest priority RBIS that the respondent has used in the past. The x indicates which strategy is being addressed using the last digit in q15.x.

q18.0.x How long have you used all or part of [strategy x from above] in the past?

- 1 = Less than one semester or term
- 2 = One semester or term
- 3 = More than one semester or term

q19.0.x Why do you no longer use [strategy x from above]?
[response]

Please indicate your level of familiarity with each of the research-based instructional strategies listed below. (Specific Strategies for Lecture, Recitation or Homework) [The priorities indicate the hierarchy for the follow-up questions for follow-up questions for “1 = I currently use all or part of it” and “2 = I have used all or part of it in the past”]

q20.0 Context-Rich Prob. (Heller & Heller) **2nd priority**

- 1 = I currently use all or part of it
- 2 = I have used all or part of it in the past
- 3 = I am familiar with it, but have never used it
- 4 = I've heard the name, but do not know much else about it
- 5 = I have never heard of it

q20.1 Experiment Problems (Van Heuvelen) **5th priority**

- 1 = I currently use all or part of it
- 2 = I have used all or part of it in the past
- 3 = I am familiar with it, but have never used it
- 4 = I've heard the name, but do not know much else about it
- 5 = I have never heard of it

q20.2 Open Source Physics (Christian) **7th priority**

- 1 = I currently use all or part of it
- 2 = I have used all or part of it in the past
- 3 = I am familiar with it, but have never used it
- 4 = I've heard the name, but do not know much else about it
- 5 = I have never heard of it

q20.3 Physlets (Christian & Belloni) **4th priority**

- 1 = I currently use all or part of it
- 2 = I have used all or part of it in the past
- 3 = I am familiar with it, but have never used it
- 4 = I've heard the name, but do not know much else about it
- 5 = I have never heard of it

q20.4 Ranking Tasks (Maloney, O’Kuma, & Hieggelke) **1st priority**

- 1 = I currently use all or part of it
- 2 = I have used all or part of it in the past
- 3 = I am familiar with it, but have never used it
- 4 = I've heard the name, but do not know much else about it
- 5 = I have never heard of it

q20.5 Research-Based Textbooks (e.g., *Physics: A contemporary Perspective* (Knight), *Six Ideas That Shaped Physics* (Moore), *Understanding Basic Mechanics* (Reif), *Understanding Physics* (Cummings, Laws, Redish, & Cooney) **8th priority**

- 1 = I currently use all or part of it
- 2 = I have used all or part of it in the past
- 3 = I am familiar with it, but have never used it
- 4 = I've heard the name, but do not know much else about it
- 5 = I have never heard of it

q20.6 Thinking Prob. (Redish) **6th priority**

- 1 = I currently use all or part of it
- 2 = I have used all or part of it in the past
- 3 = I am familiar with it, but have never used it
- 4 = I've heard the name, but do not know much else about it
- 5 = I have never heard of it

q20.7 TIPERS (O'Kuma, Hieggelke, Maloney, & Kanim) **3rd priority**

- 1 = I currently use all or part of it
- 2 = I have used all or part of it in the past
- 3 = I am familiar with it, but have never used it
- 4 = I've heard the name, but do not know much else about it
- 5 = I have never heard of it

The next two questions (q21.0.x and q22.0.x) are follow-ups for the highest priority RBIS that the respondent is currently using. The x indicates which strategy is being addressed using the last digit in q20.x.

q21.0.x How long have you used all or part of [x strategy from above]?

- 1 = Less than one semester or term
- 2 = One semester or term
- 3 = More than one semester or term

q22.0.x To what extent did you modify the instructional strategy of [x strategy from above]?

- 1 = I used it basically as described by the developer.
- 2 = I made some relatively minor modifications.
- 3 = I used some of the ideas, but made significant modifications.
- 4 = I am not familiar enough with the developer's description to answer this question.

The next two questions (q23.0.x and q24.0.x) are follow-ups for the highest priority RBIS that the respondent has used in the past. The x indicates which strategy is being addressed using the last digit in q20.x.

q23.0.x How long have you used all or part of [strategy x from above] in the past?

- 1 = Less than one semester or term
- 2 = One semester or term
- 3 = More than one semester or term

q24.0.x Why do you no longer use [strategy x from above]?
[response]

Please indicate your level of familiarity with each of the research-based instructional strategies listed below. (Specific Strategies for Lab) [The priorities indicate the hierarchy for the follow-up questions for follow-up questions for “1 = I currently use all or part of it” and “2 = I have used all or part of it in the past”]

q25.0 Real Time Physics or Tools for Scientific Thinking Labs (Thornton & Sokoloff) **1st priority**

- 1 = I currently use all or part of it
- 2 = I have used all or part of it in the past
- 3 = I am familiar with it, but have never used it
- 4 = I've heard the name, but do not know much else about it
- 5 = I have never heard of it

q25.1 Socratic Dialogue Inducing Labs (Hake) **3rd priority**

- 1 = I currently use all or part of it
- 2 = I have used all or part of it in the past
- 3 = I am familiar with it, but have never used it
- 4 = I've heard the name, but do not know much else about it
- 5 = I have never heard of it

q25.2 Video-Based Labs (Beichner; Zollman) **2nd priority**

- 1 = I currently use all or part of it
- 2 = I have used all or part of it in the past
- 3 = I am familiar with it, but have never used it
- 4 = I've heard the name, but do not know much else about it
- 5 = I have never heard of it

The next two questions (q26.0.x and q27.0.x) are follow-ups for the highest priority RBIS that the respondent is currently using. The x indicates which strategy is being addressed using the last digit in q25.x.

q26.0.x How long have you used all or part of [x strategy from above]?

- 1 = Less than one semester or term
- 2 = One semester or term
- 3 = More than one semester or term

q27.0.x To what extent did you modify the instructional strategy of [x strategy from above]?

- 1 = I used it basically as described by the developer.
- 2 = I made some relatively minor modifications.
- 3 = I used some of the ideas, but made significant modifications.
- 4 = I am not familiar enough with the developer's description to answer this question.

The next two questions (q28.0.x and q29.0.x) are follow-ups for the highest priority RBIS that the respondent has used in the past. The x indicates which strategy is being addressed using the last digit in q25.x.

q28.0.x How long have you used all or part of [strategy x from above] in the past?

- 1 = Less than one semester or term
- 2 = One semester or term
- 3 = More than one semester or term

q29.0.x Why do you no longer use [strategy x from above]?
[response]

q30.0 Are you interested in using more of the kinds of instructional strategies addressed in the previous questions?

- 1 = No
- 2 = Yes

[if Yes, the respondent sees q31.0; otherwise, skip to q32.0]

q31.0 What prevents you from using more of these strategies?
[response]

Please rate the importance of the following instructional goals for your introductory course.

q32.0 Problem Solving Skills

- 1 = Not at all important
- 2 = Somewhat important
- 3 = Very important

q32.1 Conceptual understanding of physics content

- 1 = Not at all important
- 2 = Somewhat important
- 3 = Very important

q32.2 Attitudes towards and appreciation of physics

- 1 = Not at all important
- 2 = Somewhat important
- 3 = Very important

How satisfied are you with the extent to which your students are meeting these goals?

q33.0 Problem Solving Skills

- 1 = Extremely Satisfied
- 2 = Somewhat Satisfied
- 3 = Unsure
- 4 = Somewhat Unsatisfied
- 5 = Extremely Unsatisfied

q33.1 Conceptual understanding of physics content

- 1 = Extremely Satisfied
- 2 = Somewhat Satisfied
- 3 = Unsure
- 4 = Somewhat Unsatisfied
- 5 = Extremely Unsatisfied

q33.2 Attitudes towards and appreciation of physics

- 1 = Extremely Satisfied
- 2 = Somewhat Satisfied
- 3 = Unsure
- 4 = Somewhat Unsatisfied
- 5 = Extremely Unsatisfied

q34.0 In the “lecture portion” of your introductory course, please estimate the percentage of class time spent on student activities, questions, and discussion.
[response]

In thinking about the LAST time you taught an introductory algebra- or calculus-based course ...How frequently did you use these strategies in the lecture portion of the course?

q35.0 Traditional Lecture

- 1 = Never
- 2 = Once or twice
- 3 = Several Times
- 4 = Weekly
- 5 = For Nearly Every Class
- 6 = Multiple Times Every Class

q35.1 Students discuss ideas in small groups

- 1 = Never
- 2 = Once or twice
- 3 = Several Times
- 4 = Weekly
- 5 = For Nearly Every Class
- 6 = Multiple Times Every Class

q35.2 Students design experiments/activities

- 1 = Never
- 2 = Once or twice
- 3 = Several Times
- 4 = Weekly
- 5 = For Nearly Every Class
- 6 = Multiple Times Every Class

- q35.3 Students required to work together
- 1 = Never
 - 2 = Once or twice
 - 3 = Several Times
 - 4 = Weekly
 - 5 = For Nearly Every Class
 - 6 = Multiple Times Every Class
- q35.4 Instructor solves/discusses quantitative/mathematical problem
- 1 = Never
 - 2 = Once or twice
 - 3 = Several Times
 - 4 = Weekly
 - 5 = For Nearly Every Class
 - 6 = Multiple Times Every Class
- q35.5 Instructor solves/discusses qualitative/conceptual problem
- 1 = Never
 - 2 = Once or twice
 - 3 = Several Times
 - 4 = Weekly
 - 5 = For Nearly Every Class
 - 6 = Multiple Times Every Class
- q35.6 Students solve/discuss quantitative/mathematical problem
- 1 = Never
 - 2 = Once or twice
 - 3 = Several Times
 - 4 = Weekly
 - 5 = For Nearly Every Class
 - 6 = Multiple Times Every Class
- q35.7 Students solve/discuss qualitative/conceptual problem
- 1 = Never
 - 2 = Once or twice
 - 3 = Several Times
 - 4 = Weekly
 - 5 = For Nearly Every Class
 - 6 = Multiple Times Every Class
- q35.8 Whole class voting (instructor poses questions that are answered simultaneously by the entire class)
- 1 = Never
 - 2 = Once or twice
 - 3 = Several Times
 - 4 = Weekly
 - 5 = For Nearly Every Class
 - 6 = Multiple Times Every Class

- On tests and quizzes, how often did you use:
- q36.0 Well-defined quantitative problems (e.g., typical end-of-chapter textbook problems)
- 1 = Never Used on Tests
 - 2 = Used Occasionally on Tests
 - 3 = Used Frequently on Tests
 - 4 = Used on All Tests
- q36.1 Open-ended quantitative problems (i.e., problems that do not have one definitive answer)
- 1 = Never Used on Tests
 - 2 = Used Occasionally on Tests
 - 3 = Used Frequently on Tests
 - 4 = Used on All Tests
- q36.2 Novel problems (i.e., problems that are substantially different from examples previously worked)
- 1 = Never Used on Tests
 - 2 = Used Occasionally on Tests
 - 3 = Used Frequently on Tests
 - 4 = Used on All Tests
- q36.3 Multiple choice questions
- 1 = Never Used on Tests
 - 2 = Used Occasionally on Tests
 - 3 = Used Frequently on Tests
 - 4 = Used on All Tests
- q36.4 Conceptual questions
- 1 = Never Used on Tests
 - 2 = Used Occasionally on Tests
 - 3 = Used Frequently on Tests
 - 4 = Used on All Tests
- q36.5 Questions that require students to explain their reasoning
- 1 = Never Used on Tests
 - 2 = Used Occasionally on Tests
 - 3 = Used Frequently on Tests
 - 4 = Used on All Tests
- q37.0 Which best describes your job responsibilities?
- 1 = Primarily teaching
 - 2 = Teaching accounts for more than half my responsibilities
 - 3 = Teaching accounts for about half my responsibilities.
 - 4 = Teaching accounts for less than half of my responsibilities.
- q38.0 At approximately how many meetings have you presented your research within the past two years?
[response]

q39.0 How many articles about your research have you published within the past two years?
[response]

q40.0 Do you currently have external funding for your research?
1 = Yes
2 = No

q41.0 How often did you talk or correspond with your colleagues about teaching over the past two years?
1 = Never
2 = Once or twice per term
3 = Several times per term
4 = Weekly
5 = Nearly every day

q42.0 Approximately how many talks or workshops related on teaching methods, other topics related to science education, or physics education have you attended in the past two years at professional meetings, on campus, or at other venues?
1 = None
2 = 1-3
3 = 4-9
4 = 10 or more

q43.0 Have you attended the Physics and Astronomy New Faculty Workshop?
1 = Yes
2 = No

Which of the following journals about teaching do you read regularly? (check all that apply)

q44.0 American Journal of Physics
1 = I read this journal

q44.1 The Physics Teacher
1 = I read this journal

q44.2 Physical Review Special Topics – Physics Education Research
1 = I read this journal

q44.3 Journal of College Science Teaching
1 = I read this journal

q44.4 Other pedagogical journals
1 = I read other journals

q44.5 Specify: _____
[names of other pedagogical journals]

q45.0 What is your gender?
1 = Female
2 = Male

q46.0 What is your highest earned degree?

1 = Undergraduate

2 = Masters

3 = PhD

q47.0 How many total years of faculty teaching experience do you have?

[response]

q48.0 How many years have you been a member of the teaching faculty at your current institution?

[text box]

q49.0 Which best describes your current position.

1 = Tenured

2 = Tenure-Track but not yet tenured

3 = Non-Tenure Track

4 = University does not have a tenure system

q49.1 [year of tenure] (if tenured)

q50.0 What is your current rank?

1 = Lecturer

2 = Assistant Professor

3 = Associate Professor

4 = Full professor

5 = Other

q50.1 [other rank]

q51.0 Do you have any comments that you would like to add about any of the issues covered in this survey?

[response]