

# 2009 Undergraduate Teaching in the Geosciences: Faculty Survey

Please respond within **two weeks**

## *Your Background*

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**1. What is the highest degree level that you have completed?**

- Masters
  - PhD or doctorate
  - Other, *please specify:*
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**2. What was the year of your highest degree?**

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**3. How many years have you taught at the college or university level?**

*Do not include any experience as a graduate teaching assistant*

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**4. Which of the following best describes your disciplinary focus?**

- Geology or Geophysics
  - Oceanography or Marine Science
  - Atmospheric Science or Meteorology
  - Other, *please specify:*
-

**5. Which of the following best describes your current position?**

- Full professor
  - Associate professor
  - Assistant professor
  - Instructor or Lecturer
  - Adjunct or Visiting professor
  - Research professor or Scientist
  - Administrator
  - Retired
  - Other, *please specify*:
- 

**6. Please indicate the number of each of the following courses you taught during the spring 2008 and fall 2008? If you taught a two-term course or the same course for consecutive terms, please count each term separately.**

- Introductory courses
- Courses for majors
- Graduate-level courses

- I did not teach during Fall 2008 or Spring 2008
- 

Continue

## 2009 Undergraduate Teaching in the Geosciences Continued

### *Introductory Course \$num*

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7. What is the name of the most recent introductory course that you taught?

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8. Which of the following best describes the introductory courses that you taught during the spring 2008 and fall 2008? Please write in the number of courses taught.

<input type="text"/>	Climate Change
<input type="text"/>	Earth Science
<input type="text"/>	Earth System Science
<input type="text"/>	Environmental Geology
<input type="text"/>	Historical Geology
<input type="text"/>	Meteorology
<input type="text"/>	Oceanography
<input type="text"/>	Physical Geology
<input type="text"/>	Other courses <input type="text"/>

- 
9. How many students were in your most recent introductory course?

- 
10. Did your course have a separate associated laboratory section?

- Yes
  - No
- 

**11. Did your course have a separate associated discussion section?**

- Yes
  - No
- 

**12. In the "lecture portion" of your introductory course, please estimate the percentage of class time spent on student activities, questions, and discussion.**

%

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**13. In the "lecture portion", please indicate how frequently you used the following teaching strategies in teaching your most recent introductory course. Please use a scale from 1 to 5, where 1 is "never" and 5 is "nearly every class."**

	Never	Once or twice	Several times	Weekly	Nearly every class
	1	2	3	4	5
Traditional lecture	<input type="radio"/>				
Lecture with demonstration	<input type="radio"/>				
Lecture in which questions posed by instructor are answered by individual students	<input type="radio"/>				
Lecture in which questions posed by instructor are	<input type="radio"/>				

answered simultaneously  
by the entire class

	Never	Once or twice	Several times	Weekly	Nearly every class
	1	2	3	4	5
Small group discussion or think-pair-share	<input type="radio"/>				
Whole-class discussions	<input type="radio"/>				
In-class exercises	<input type="radio"/>				

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***The following questions pertain to the entire course including lecture, labs, and discussion sections.***

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**14. In your most recent introductory course, please indicate the types of problem-solving activities that your students completed.**  
*(Check all that apply)*

- Students were guided through a data analysis and problem solving activity
- Students solved a problem with little guidance
- Students posed and solved their own problem
- Students collected their own data and analyzed them to solve a problem
- Students interpreted data in light of information in the primary literature
  
- Students addressed a problem of national or global interest
- Students worked on a problem of interest to the local community
- Students developed a geologic history of a field area
  
- Students used online tools to integrate their own data with a larger data set
- Students accessed online scientific data and analyzed them to solve a problem

- Students used a computational model to explore systems behavior
  - Students used computer-generated visualizations of 3- or 4-D geologic, oceanic, or atmospheric data
- 

**15. Please indicate how frequently you used the following student activities in teaching your most recent introductory course on a scale from 1 to 5, where 1 is "never" and 5 is "nearly every class."**

	Never	Once or twice	Several times	Weekly	Nearly every class
	1	2	3	4	5
Students read the primary literature	<input type="radio"/>				
Students solved basic quantitative problems	<input type="radio"/>				
Students used algebraic equations to describe Earth processes	<input type="radio"/>				
Students described observational data using statistics (mean, standard deviation)	<input type="radio"/>				
Students solved problems using skills learned in a calculus course	<input type="radio"/>				
Students worked with data visualizations used by geoscience researchers	<input type="radio"/>				
Students graphed observational data	<input type="radio"/>				

	Never	Once or twice	Several times	Weekly	Nearly every class
	1	2	3	4	5
Students were instructed in the field	<input type="radio"/>				
Students made qualitative observations in the field	<input type="radio"/>				

Students collected basic quantitative field data	<input type="radio"/>				
Students solved problems using field observations	<input type="radio"/>				
Students made a geologic map	<input type="radio"/>				
Students worked with geospatial data	<input type="radio"/>				

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**16. Please indicate which of the following assessment strategies you used in your most recent introductory course.**  
*(Check all that apply)*

- Exams
  - Quizzes
  - Papers
  - Oral presentations
  - Problem sets
  - Portfolios
  - Other, *specify*
- 

**17. In setting the goals for your most recent introductory course, how important were each of the following.**

▼ Developing problem solving skills such as the ability to analyze data and draw conclusions

▼ Developing communication skills such as scientific writing and oral presentation

▼ Developing interpersonal skills including the ability to work in groups

▼ Mastery of conceptual understanding of specific geoscience content

Select one ▼

Increasing student awareness of the utility of geoscience in addressing important problems

Select one ▼

Providing authentic experiences that simulate or emulate professional activities

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**18. Which of the following did you address in the design of your most recent introductory course or activities for it?**

*(Check all that apply)*

- Student motivation
  - Student comfort in the physical environment of the course/lab
  - Student comfort in the intellectual environment of the course
  - Student comfort with controversial topics
  
  - Your own comfort with controversial topics
  - Student anxiety about specific activities
  - Your own anxiety about specific activities
  - None of the above
- 

**19. In your most recent introductory course, please indicate the types of strategies dealing with student attitudes, motivations, and comfort that had the largest impact on student learning.**

*(Check all that apply)*

- I do not believe that student attitudes, motivations, and comfort have an impact on student learning
- Designing activities that motivate my students
- Providing opportunities for low-stakes practice before high-stakes assignments, activities, or exams
- Including activities that allow student to get to know one another
- Getting to know something about my students as individuals
  
- Using group projects, field work, or other activities that promote teamwork and collaborative learning

- Including content that is relevant to students' experience
  - Focusing on important geoscience concepts
  - Fostering a comfortable learning environment
  - Other, *specify*
- 

**20. Have you made any changes in the content that you teach in your introductory course within the past two years?**

- Yes
  - No *If no, [click to skip to question 22.](#)*
- 

**21. What content changes have you made in your introductory course within the past two years?**

*(Check all that apply)*

- Updated content with latest research findings
  - Changed textbook
  - Reorganized the topics covered
  - Included recent geological events covered in the general media
  
  - Increased emphasis on a specific area, e.g. environmental issues
  - Added new content area
  - Increased emphasis on local environment or local geology
  - Other, *specify*
- 

**22. Have you made any changes in the teaching methods used in your introductory course within the past two years?**

- Yes
  - No *If no, [click to skip to question 24.](#)*
-

**23. What changes have you made in the teaching methods in your introductory course within the past two years?**

*(Check all that apply)*

- Spent less time lecturing
  - Employed more demonstrations during lectures
  - Increased questioning of students during lectures
  - Added group work or small group activities
  
  - Spent more time on class discussions or small group discussions
  - Changed assessment tools or strategies
  - Added assignments, e.g. more writing
  - Other, *specify*
- 

**24. Reflect on the last time you made a substantive revision to a course. Which of the following statements most closely approximate(s) your motivation for making this change? (Check all that apply)**

- The previous time I taught the course, it did not go well.
- I adopted a new philosophy for my teaching
- The content needed to be updated
- I received a great new idea from a colleague, a publication, or the web that I developed for my course
- I found a data set or software tool that opened up new teaching possibilities
- I found the ideal activity for use in my class on a website or in a publication and adopted it wholesale
  
- A grant provided the resources to make revisions
- A change in the content was mandated by my department or institution
- New facilities (e.g. computers, analytical equipment, classroom space) provided new opportunities for teaching
- I had a leave that gave me time to work on my course
- I attended a workshop or other professional development opportunity that inspired me to make changes

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**25. When you get ready to revise a course, which of the following do you consider?**

*(Check all that apply)*

- My strengths, interests, and weaknesses as a teacher
- My students' level of expertise
- My students' goals for the course
- My goals for my students
- The opportunities provided by my local setting
- The mission of my institution
- Requirements for licensure, accreditation
  
- Campus-wide curriculum requirements
- Student feedback from previous years
- Student performance in previous years
- New geoscience research on this topic
- What my colleagues are doing
- Other, *specify*

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**26. When you are designing a new activity, which of the following do you routinely do:**

*(Check all that apply)*

- Talk with your colleagues about how they teach this topic
- Discuss new ideas with students
- Look on the web to see what activities others have developed on this topic
- Look for activities in texts, lab manuals, or instructor guides
  
- Look first to see what data are available
- Brainstorm ideas before looking to see what is available
- Read education research papers about the methods I am considering
- None of the above

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**27. Would you like to report on another introductory course you recently taught?**

Yes

No

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Continue

## 2009 Undergraduate Teaching in the Geosciences Continued

### Course For Majors

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**28. What is the name of the most recent course for majors that you taught?**

*If you taught two or more courses simultaneously, pick one*

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**29. Which of the following best describes each of the courses for undergraduate majors that you taught during the spring 2008 and fall 2008? Please enter the number of courses taught in each category.**

- Atmospheric Science
  - Geochemistry
  - Geomorphology or Surface Processes
  - Geophysics
  - Hydrogeology
  - Marine Geoscience
  - Mineralogy
  
  - Paleontology
  - Petrology
  - Planetary Geoscience
  - Sedimentology or Stratigraphy
  - Structural Geology or Tectonics
  - Other
- 

**30. How many students were in the most recent course you taught for**

majors?

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**31. Did your course have a separate associated laboratory section?**

- Yes
- No

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**32. Did your course have a separate associated discussion section?**

- Yes
- No

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**33. In the "lecture portion" of your course for majors, please estimate the percentage of class time spent on student activities, questions, and discussion.**

 %

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**34. In the "lecture portion", please indicate how frequently you used the following teaching strategies in teaching your most recent course for majors. Please use a scale from 1 to 5, where 1 is "never" and 5 is "nearly every class."**

	Never	Once or twice	Several times	Weekly	Nearly every class
	1	2	3	4	5
Traditional lecture	<input type="radio"/>				

Lecture with demonstration	<input type="radio"/>				
Lecture in which questions posed by instructor are answered by individual students	<input type="radio"/>				
Lecture in which questions posed by instructor are answered simultaneously by the entire class	<input type="radio"/>				
	<b>Never</b>	<b>Once or twice</b>	<b>Several times</b>	<b>Weekly</b>	<b>Nearly every class</b>
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
Small group discussion or think-pair-share	<input type="radio"/>				
Whole-class discussions	<input type="radio"/>				
In-class exercises	<input type="radio"/>				

***The following questions pertain to the entire course including lecture, labs, and discussion sections.***

**35. In your most recent course for majors, please indicate the types of problem-solving activities that your students completed.**  
*(Check all that apply)*

- Students were guided through a data analysis and problem solving activity
- Students solved a problem with little guidance
- Students posed and solved their own problem
- Students collected their own data and analyzed them to solve a problem
- Students interpreted data in light of information in the primary literature
  
- Students addressed a problem of national or global interest

- Students worked on a problem of interest to the local community
  - Students developed a geologic history of a field area
  
  - Students used online tools to integrate their own data with a larger data set
  - Students accessed online scientific data and analyzed them to solve a problem
  - Students used a computational model to explore systems behavior
  - Students used computer-generated visualizations of 3- or 4-D geologic, oceanic, or atmospheric data
- 

**36. Please indicate how frequently you used the following student activities in teaching your most recent course for majors on a scale from 1 to 5, where 1 is "never" and 5 is "nearly every class."**

	Never	Once or twice	Several times	Weekly	Nearly every class
	1	2	3	4	5
Students read the primary literature	<input type="radio"/>				
Students solved basic quantitative problems	<input type="radio"/>				
Students used algebraic equations to describe Earth processes	<input type="radio"/>				
Students described observational data using statistics (mean, standard deviation)	<input type="radio"/>				
Students solved problems using skills learned in a calculus course	<input type="radio"/>				
Students worked with data visualizations used by geoscience researchers	<input type="radio"/>				
Students graphed observational data	<input type="radio"/>				

	Never	Once or twice	Several times	Weekly	Nearly every class
	1	2	3	4	5
Students were instructed in the field	<input type="radio"/>				
Students made qualitative observations in the field	<input type="radio"/>				
Students collected basic quantitative field data	<input type="radio"/>				
Students solved problems using field observations	<input type="radio"/>				
Students made a geologic map	<input type="radio"/>				
Students worked with geospatial data	<input type="radio"/>				

**37. Please indicate which of the following assessment strategies you used in your most recent course for majors.**  
*(Check all that apply)*

- Exams
- Quizzes
- Papers
- Oral presentations
- Problem sets
- Portfolios
- Other, *specify*

**38. In setting the goals for your most recent course for majors, how important were each of the following.**

▼

Developing problem solving skills such as the ability to analyze data and draw conclusions

- ▼ Developing communication skills such as scientific writing and oral presentation
- ▼ Developing interpersonal skills including the ability to work in groups
- ▼ Mastery of conceptual understanding of specific geoscience content
- ▼ Increasing student awareness of the utility of geoscience in addressing important problems
- ▼ Providing authentic experiences that simulate or emulate professional activities
- 

**39. Which of the following do you address in the design of your most recent course for majors or activities for it?**  
*(Check all that apply)*

- Student motivation
  - Student comfort in the physical environment of the course/lab
  - Student comfort in the intellectual environment of the course
  - Student comfort with controversial topics
  
  - Your own comfort with controversial topics
  - Student anxiety about specific activities
  - Your own anxiety about specific activities
  - None of the above
- 

**40. In your most recent course for majors, please indicate the types of strategies dealing with student attitudes, motivations, and comfort that had the largest impact on student learning.**  
*(Check all that apply)*

- I do not believe that student attitudes, motivations, and comfort have an

impact on student learning

- Designing activities that motivate my students
  - Providing opportunities for low-stakes practice before high-stakes assignments, activities, or exams
  - Including activities that allow student to get to know one another
  - Getting to know something about my students as individuals
  
  - Using group projects, field work, or other activities that promote teamwork and collaborative learning
  - Including content that is relevant to students' experience
  - Focusing on important geoscience concepts
  - Fostering a comfortable learning environment
  - Other, *specify*
- 

**41. Have you designed a new course for majors or made any changes to the content of a course for majors within the past two years?**

- Yes
  - No *If no, [click to skip to question 48.](#)*
- 

**42. What content changes have you made in your course for majors within the past two years?**

*(Check all that apply)*

- Updated content with latest research findings
  - Changed textbook
  - Reorganized the topics covered
  - Included recent geological events covered in the general media
  
  - Increased emphasis on a specific area, e.g. environmental issues
  - Added new content area
  - Increased emphasis on local environment or local geology
  - Other, *specify*
-

**43. Have you made any changes in the teaching methods used in your course for majors within the past two years?**

- Yes
  - No *If no, [click to skip to question 45.](#)*
- 

**44. What changes have you made in the teaching methods in your course for majors within the past two years?**

*(Check all that apply)*

- Spent less time lecturing
  - Employed more demonstrations during lectures
  - Increased questioning of students during lectures
  - Added group work or small group activities
  
  - Spent more time on class discussions or small group discussions
  - Changed assessment tools or strategies
  - Added assignments, e.g. more writing
  - Other, *specify*
- 

**45. How do you learn about new teaching methods?**

*(Check all that apply)*

- Professional meetings or workshops
  - Publications
  - Discussions with other faculty members in my department
  - Discussions with colleagues in other institutions
  - On-line resources
  - My own research
-

**46. Reflect on the last time you made a substantive revision to a course. Which of the following statements most closely approximate(s) your motivation for making this change?**

*(Check all that apply)*

- The previous time I taught the course, it did not go well.
  - I adopted a new philosophy for my teaching
  - The content needed to be updated
  - I received a great new idea from a colleague, a publication, or the web that I developed for my course
  - I found a data set or software tool that opened up new teaching possibilities
  - I found the ideal activity for use in my class on a website or in a publication and adopted it wholesale
  
  - A grant provided the resources to make revisions
  - A change in the content was mandated by my department or institution
  - New facilities (e.g. computers, analytical equipment, classroom space) provided new opportunities for teaching
  - I had a leave that gave me time to work on my course
  - I attended a workshop or other professional development opportunity that inspired me to make changes
- 

**47. When you get ready to revise a course, which of the following do you consider?**

*(Check all that apply)*

- My strengths, interests, and weaknesses as a teacher
- My students' level of expertise
- My students' goals for the course
- My goals for my students
- The opportunities provided by my local setting
- The mission of my institution
- Requirements for licensure, accreditation
  
- Campus-wide curriculum requirements
- Student feedback from previous years
- Student performance in previous years

- New geoscience research on this topic
  - What my colleagues are doing
  - Other, *specify*
- 

**48. When you are designing a new activity, which of the following do you routinely do:**  
(Check all that apply)

- Talk with your colleagues about how they teach this topic
  - Discuss new ideas with students
  - Look on the web to see what activities others have developed on this topic
  - Look for activities in texts, lab manuals, or instructor guides
  
  - Look first to see what data are available
  - Brainstorm ideas before looking to see what is available
  - Read education research papers about the methods I am considering
  - None of the above
- 

**49. Would you like to report on another course for majors you recently taught?**

- Yes
  - No
- 

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## 2009 Undergraduate Teaching in the Geosciences Continued

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### Geoscience course content and research in your field

50. At how many meetings have you presented your scientific research within the past two years?

None ▼

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51. How many articles about your research have you published within the past two years?

None ▼

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52. How do you stay current with geoscience content that is beyond the scope of your research?

*(Check all that apply)*

- Communicate with colleagues
  - Attend talks, poster sessions, or presentations
  - Read journal articles
  - Search internet
  - Other, *specify*
- 

53. How often did you talk or correspond with your colleagues about course content over the past two years?

- Never
- Once or twice per term
- Several times per term
- Weekly
- Nearly every day

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**Pedagogy**

**54. How do you learn about new teaching methods?**  
(Check all that apply)

- Professional meetings or workshops
- Publications
- Discussions with other faculty members in my department
- Discussions with other colleagues on campus
- Discussions with colleagues in other institutions
- On-line resources
- My own research

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**55. Approximately, how many talks on teaching methods, other topics related to science education, or geoscience education have you attended in the past two years at professional meetings, on campus, or at other venues?**

None ▼

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**56. How many workshops related to improving your teaching did you attend in the past two years?**

None ▼

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**57. Do you frequently communicate with your colleagues about:**  
(Check all that apply)

- New ideas in pedagogy
- New ideas for content

- Specific assignments or activities
  - Problems I encounter in my teaching
  
  - Classroom management issues
  - Course design
  - How to teach a specific course
  - How to assess student learning
- 

**58. Which of the following do you turn to for advice on teaching?**  
(Check all that apply)

- Colleagues in my department
  - Other colleagues on campus
  - Colleagues at the campus teaching / learning center
  - Colleagues outside my institution whom I know from my geoscience research
  - Colleagues outside my institution whom I met through my interest in teaching
  - Nationally known leaders on education
  - Other, *specify*
- 

**59. How often did you talk to or correspond with your colleagues about your teaching over the past two years?**

- Never
  - Once or twice per term
  - Several times per term
  - Weekly
  - Nearly every day
- 

**60. What do you rely on to determine if your teaching is working?**

*(Check all that apply)*

- Experience and gut instinct
  - Performance on exams, quizzes, assignments
  - Students show up for class and appear to enjoy class
  - Level of student engagement in class
  - Conversations with students
  - End-of-class or mid-term evaluations or surveys
  - Other, specify
- 

**61. When you have done something that is particularly successful in class, which of the following do you routinely do?**

*(Check all that apply)*

- Tell colleagues whom I know will be interested
  - Tell students whom I know will be interested
  - Share my success via a list-serv for faculty
  - Post my activity on my own website
  - Add my activity to a collection of activities (e.g. Cutting Edge, Starting Point, DLESE)
  - Publish a paper about my activity
  - None of the above
- 

**62. How often do you use the Cutting Edge website?**

- Never, I did not know there was such a website
  - Never, but I know of the website
  - Rarely
  - Monthly
  - Weekly or more often
-

**63. If you have used it, which parts of the site did you use?**

*(Check all that apply)*

- Geoscience topical collections
  - Pedagogic topical collections
  - Teaching materials (activities, syllabi)
  - Workshop information
  - Visualization collections
  - Other, *specify*
- 

**64. For which of the following have you used on-line teaching resources within the past two years?**

*(Check all that apply)*

- Surf for ideas for your teaching
  - Download materials to use in the class
  - Find materials for students to use in assignments
  - Learn about the content you will be teaching
  - Learn about the methods you will be using
  - None of the above
- 

**65. How has the use of on-line resources positively impacted your teaching within the past two years?**

*(Check all that apply)*

- Increased the variety of methods that I use
  - Increased my skill with a particular teaching method
  - Increased my confidence as a teacher
  - Increased my ability to assess student learning
  - Influenced the topics that I address in my course
  - Increased my knowledge of a particular topic
  - Other *specify*
-

**66. Which of the following journals about teaching do you read regularly?**  
(Check all that apply)

- I do not regularly read journals about teaching
  - Journal of College Science Teaching
  - Journal of Geoscience Education
  - Journal of Research in Science Teaching
  - Other pedagogical journals, *specify*
- 

**67. Have you presented research on teaching methods or student learning at meetings within the past two years?**

- Yes
  - No
- 

**68. How many articles have you published about educational topics within the past two years?**

▼ *If none, [click here](#) to skip to question 72.*

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**69. Of these articles, how many describe:**

- Your research on teaching methods or student learning
  - Your classroom or curriculum innovations
  - Other, (Please describe)
- 

**70. Which of the following ways have you shared or published materials (e.g. syllabi, student assignments, resources for students) from your courses in the last two years?**  
(Check all that apply)

- In my department
  - Posted on-line
  - Talks
  - Published in journals
  - None of the above
- 

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## 2009 Undergraduate Teaching in the Geosciences continued

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**71. Please add any additional comments you would like to make:**

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Continue