

# **Report: Pre-workshop survey**

# Motivation for this workshop:

- Engage a broader audience of students in geophysics topics early
- Generate excitement about geophysics-related careers
- Learn about existing course materials and research/field experiences

# Survey Objectives

- Solicit community input on:
  - how to best engage broader audiences of students early in their careers
  - which teaching methods and hands-on activities would be best received and most appropriate
  - what resources might be needed to make course materials most effective

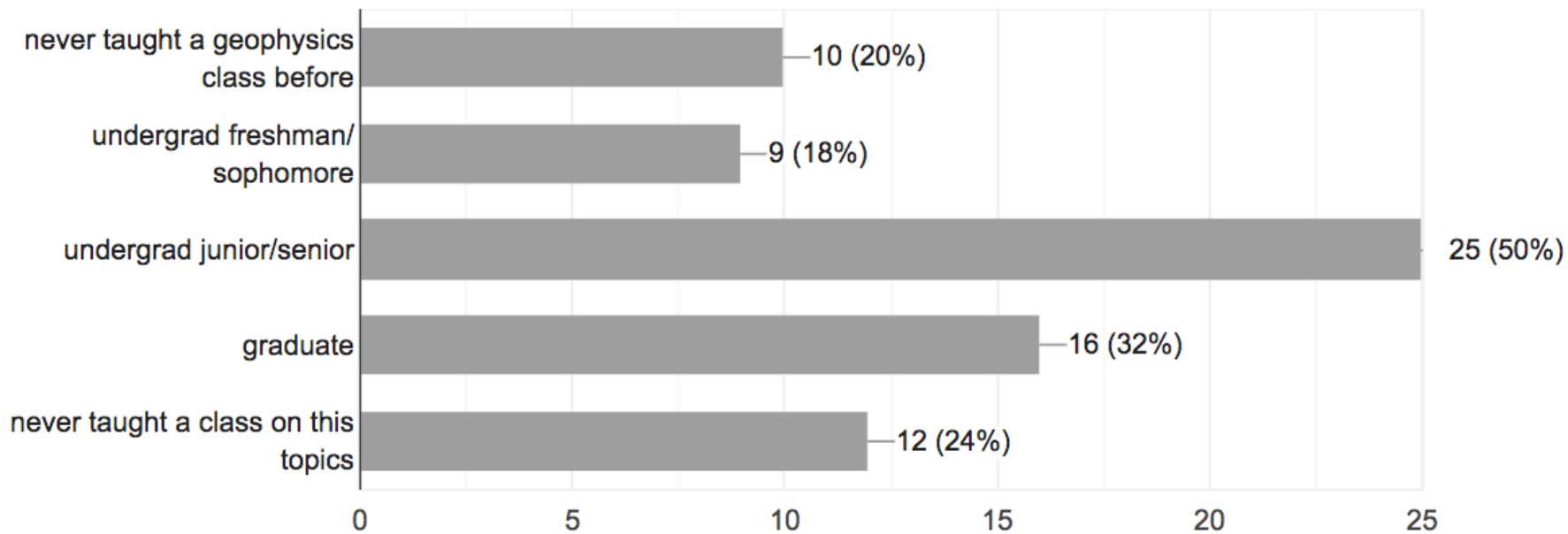
# Survey Circulation (3/28/19 - now)

- near-surface.org
- SEG Near Surface
- IRIS All
- IRIS EPO
- AGU Education listserv
- AGU Near Surface listserv
- AGU Hydrogeophysics listserv
- Twitter/Facebook



# Have you ever taught a class on the topic of near surface/environmental geophysics? At what level?

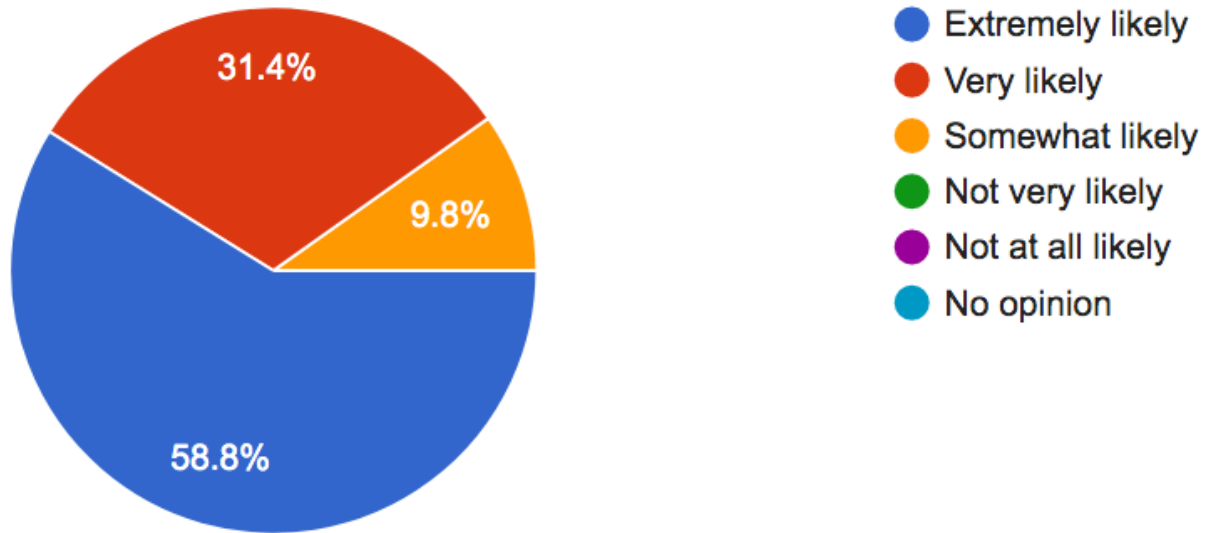
50 responses



## Would you use LESSONS?

Lessons: How likely are you to value fully-developed, 45 minute to 1 hour length lessons for an Urban & Environmental Geophysics class?

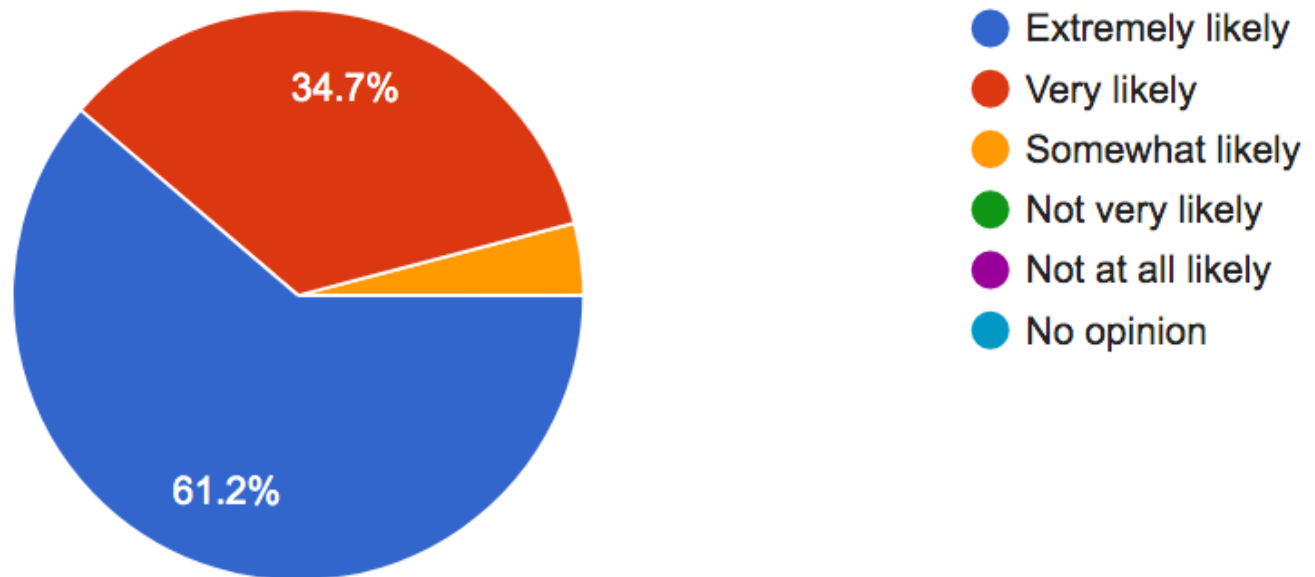
51 responses



## Would you use LABS?

Labs: How likely are you to value activities and exercises, ~20-25 minutes in length, for placement in a laboratory environment?

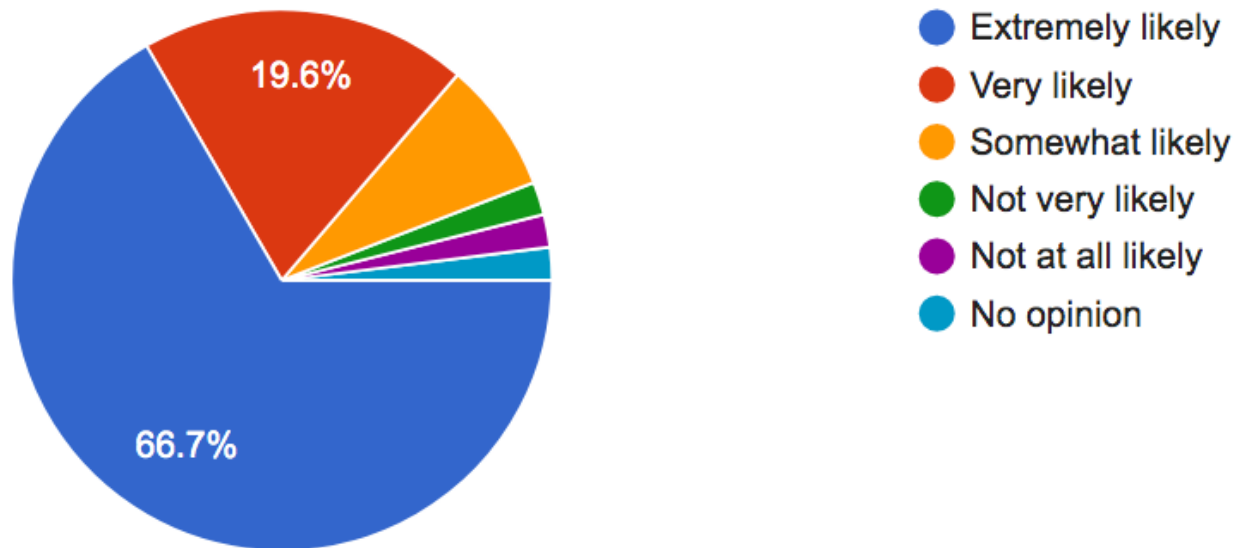
49 responses



## Would you use FIELD EQUIPMENT?

Field Instrumentation: How likely are you to utilize field instrumentation in your geophysics course?

51 responses

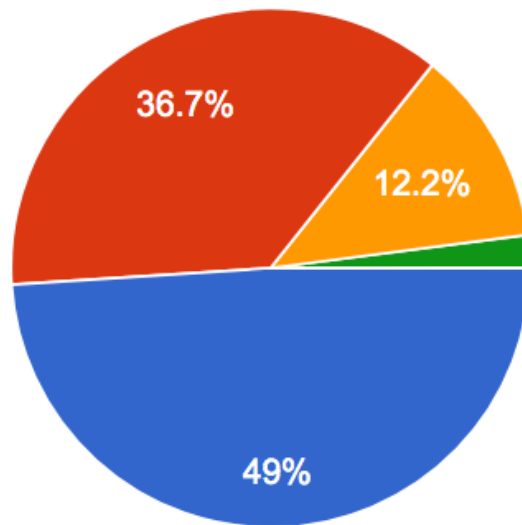




## What level of course development?

For a course with shareable content on the topic of Urban & Environmental Geophysics to be aimed at the early-undergraduate level, what level of course development should be provided?

49 responses

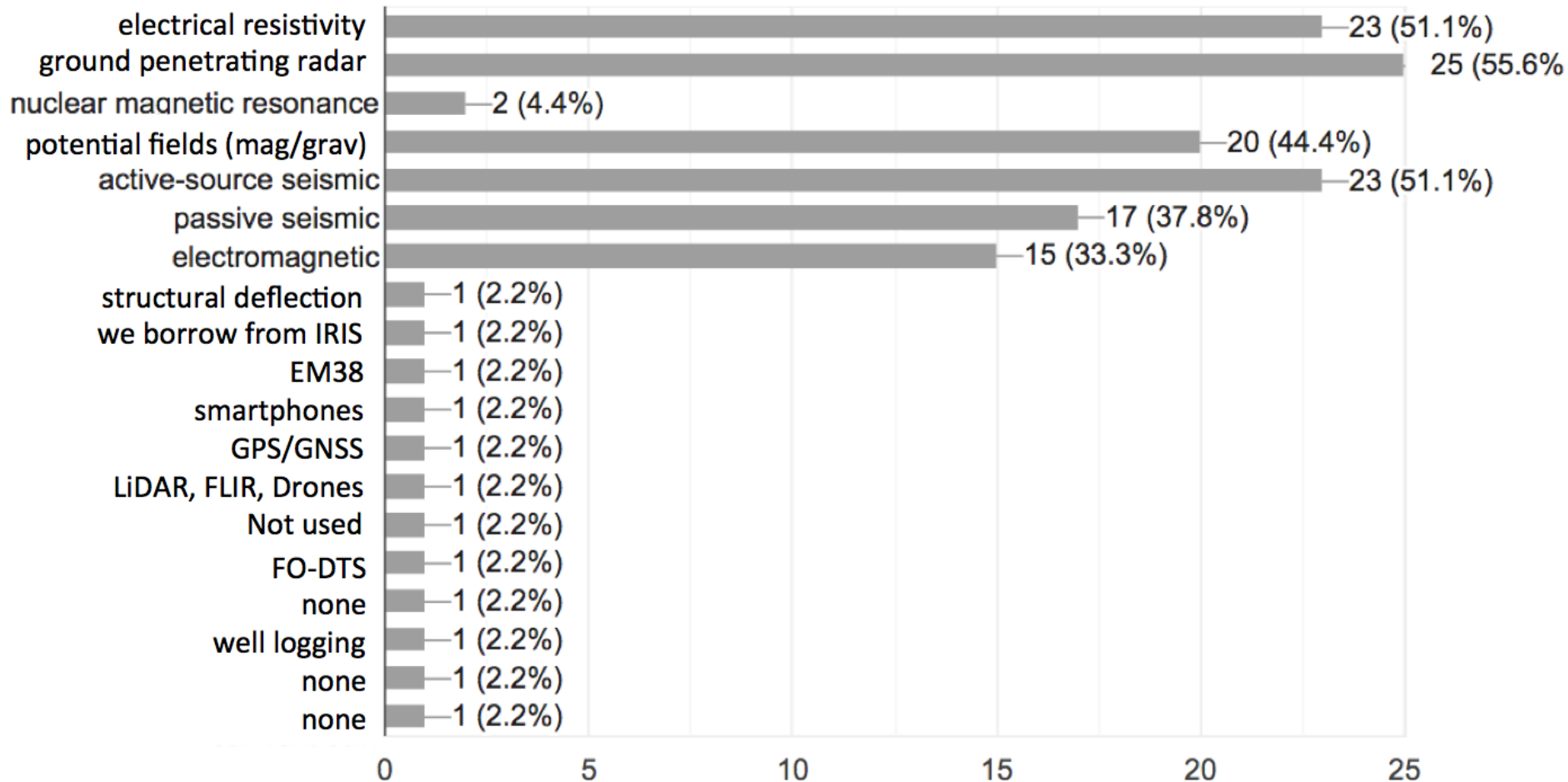


- All lectures, labs, datasets, and instruments should be provided for each module of the course
- Labs should be fully developed with datasets and instruments available, but only lecture outlines are needed
- Locally available instruments should be used, so only the written lab materials would need to be provided
- Lectures only; no labs would be used

## What instruments do you HAVE?

What instrumentation for field-based teaching do you have available in your department/institution and does it meet your needs?

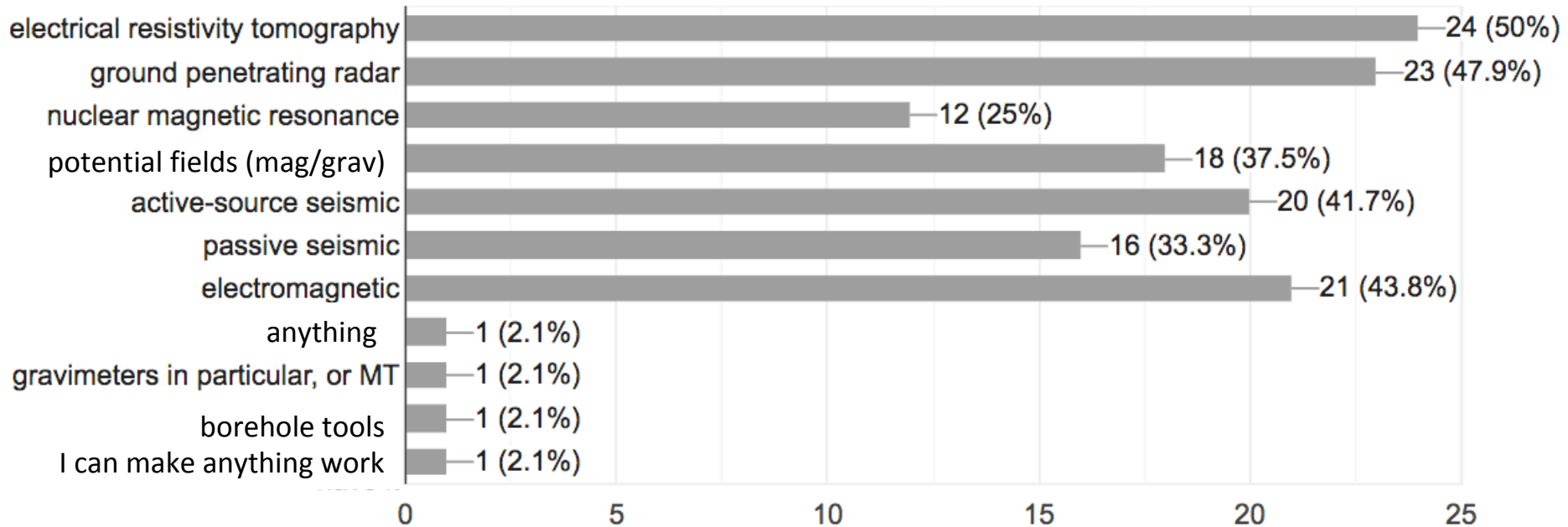
45 responses



## What instruments WOULD YOU USE?

Access to which of the following instrumentation would most benefit your teaching efforts in geophysics?

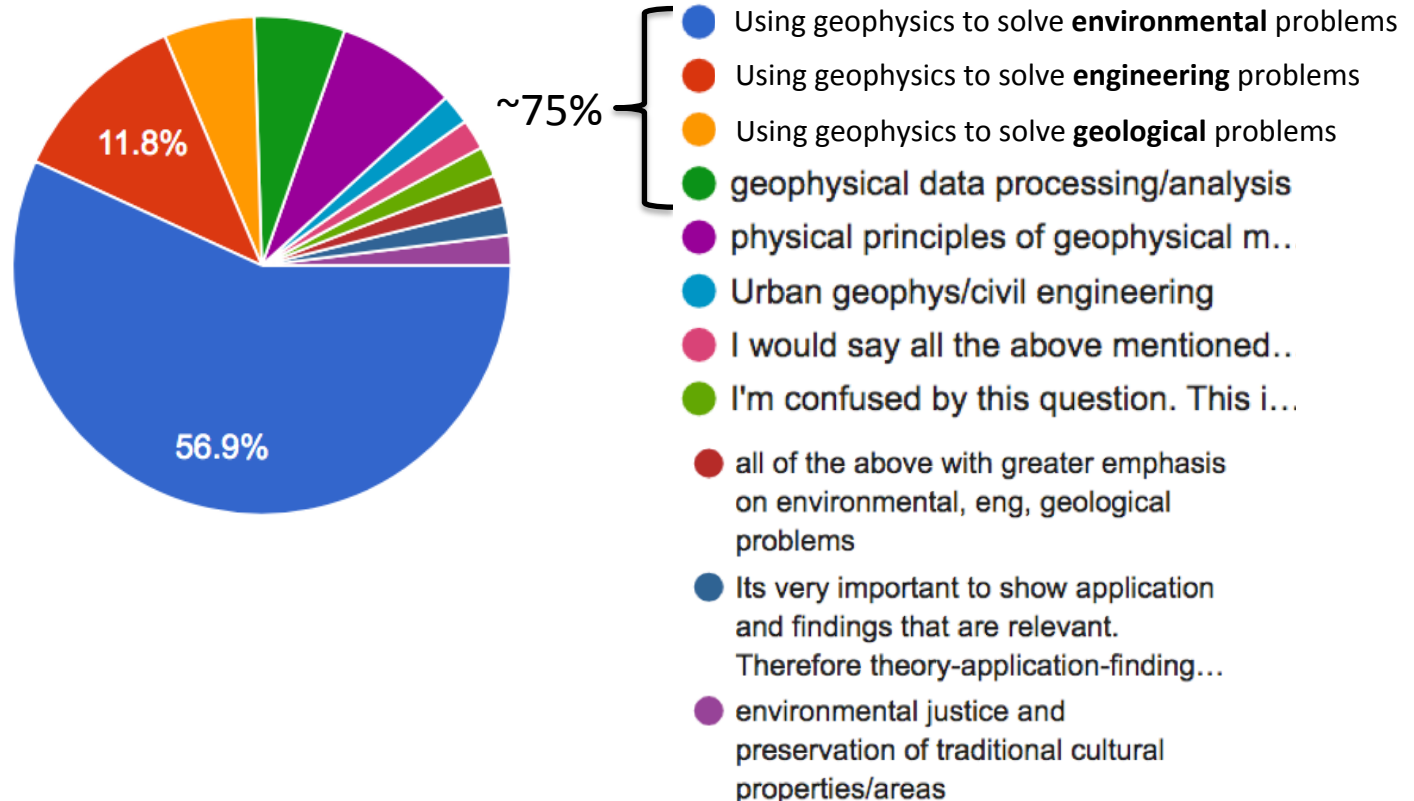
48 responses



## Topical focus for INCREASING PARTICIPATION?

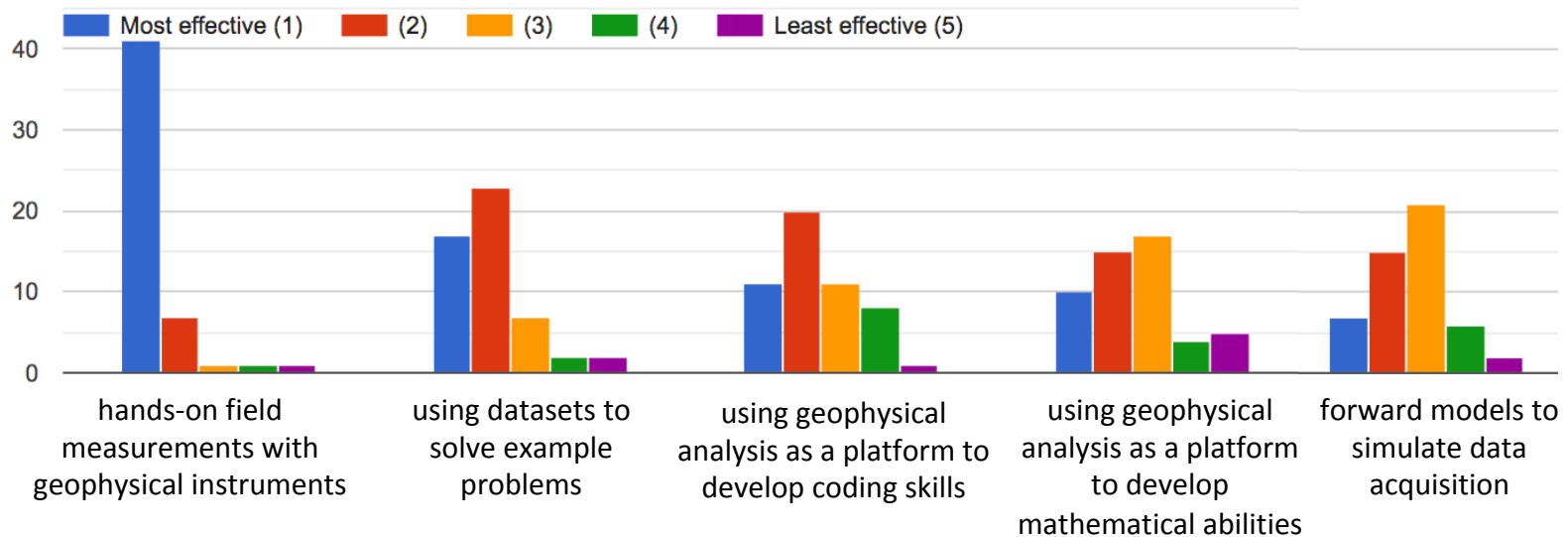
Which of the following general course topics would be most effective – for students and educators – at increasing participation in geophysical sciences from underrepresented audiences?

51 responses



## Most effective COURSE FEATURES?

Please rank the order in which the following course features would be most effective for you to engage and excite students from diverse backgrounds in geophysics:



What do you view as the primary value in increasing diversity in the geophysical sciences?

**Key common comment examples:**

- Diverse groups are better at solving problems
- Better transmission of information to a broader population
- Community buy-in
- Different perspectives and experiences
- Increasing awareness of geophysics

**For a course with shareable content on the topic of Urban & Environmental Geophysics to be aimed at the early-undergraduate level, please provide a brief explanation of what you believe to be the “most effective” and “least effective” assessment methods.**

**Most effective:**

- Lab writeup
- production, implementation and analysis of a viable project
- Project based assignments, writeups and presentations
- Homework
- Exams
- Module-based assessment

**Least effective:**

- Straight examinations
- Math tests
- Memorization-based assessment
- Plug-and-chug problem sets
- Course project
- Cumulative final exams

*Overlapping opinions about traditional exams and problem sets!*

**Other comments related to development of a freshman/sophomore level course designed to increase participation of underrepresented groups in geophysics.**

- Validating/affirming the students initiated by in- and out-of-class agents that fosters academic and personal development.
- Use display screens to combat common stereotypes.
- Be culturally relevant, demonstrate utility and impact
- I wonder why this course is offered at freshman/sophomore level.
- I am loath to take up a class that involves field projects, especially since I have little experience with geophysical instrumentation.
- focus on socially impactful issues and career-relevant skills broadens the overall participation



**What has been the primarily limitation in effective implementation of a geophysics course in your program/department?**

They need to be trained in analysis techniques, and we have only a couple of licenses for the analysis software. This means that I spend a lot of class time and a lot of time outside of class working with individual groups on how to use the software.

The traditional structure of our College, in which the geophysics faculty are housed in a graduate college with little contact with undergraduates

Many students don't have the math background to tackle the level of problem that would actually be useful and that employers / grad schools want to see

No specific required curriculum for such a course

Many of the students are afraid of taking the math courses required and therefore cannot take the Introduction to Geophysics until very late in their career.

Number of students who would be interested in signing up for such classes

Lack of advanced instrumentation and instructor availability

Lack of background, equipment and competition with other established courses.

lack of department support, large class sizes make field work challenging without teaching assistants, more equipment needed for large number of students

Lack of departmental support and appropriate teaching personnel

# Summary

- Instructors seem willing to use fully developed lab and lecture course materials when they are developed
- Enthusiasm for lab activities and hands-on with instruments
- Many respondents already have some of the common instruments available (representative sample of respondents?)
- Focusing on environmental and engineering problems would be most popular
- Hands on data collection and using provided data is viewed as more effective than modeling or teaching math

# Conclusions

- The course materials are likely to be used
- Math is seen as a hurdle, however this is not viewed as a platform for developing math skills
- A lot of instructors who would be interested in the course materials already have some instruments
- Some contrasting views on most effective assessment methods