

Dissertation Synopsis and Pilot Instrument: Non-Response Bias on Web-based Surveys
As Influenced by the Digital Divide and Participation Gap

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Higher education scholars, policy makers, and administrators know little about the experiences of undergraduate students who matriculate with minimal experience with technology. It is often assumed that all students, particularly traditionally-aged students, have significant experience with, knowledge of, and comfort with technology. Although that assumption is correct for many students, it is false for others. Moreover, web-based assessment efforts likely are not collecting adequate and accurate data about these students.

Although little is known about these students, there are tantalizing glimpses. National surveys of institutions or students indicate that a significant number of students do not own a computer. National surveys of students have reported different numbers of students without computers, from 1.2% of respondents (Smith, Salaway, & Caruso, 2009) to 2.7% of respondents (Junco & Mastrodicasa, 2007). EDUCAUSE member institutions report that between 10% and 20% of their students do not own computers (EDUCAUSE, 2009). Similarly, studies have revealed differences in how college students and youths use computers, differences that are significantly influenced by economic and cultural factors such as how easily and often they can use Internet-connected computers (Palfrey & Gasser, 2008; Ito et al., 2010; Watkins, 2009). So it is clear that there are some students who neither own computers nor use them in ways that most of their peers use them.

Problem

But no one knows how many of these students are on American college campuses. Little is known about who they are. And very little is known about their experiences and how their technological aptitude is shaping their academic and social experiences. Moreover, no one knows if our current methods of assessment – methods that often rely exclusively on web-based surveys advertised via e-mail – are gathering adequate information from these students and adequately representing their experiences, opinions, and needs.

Purpose

This study will explore the response rates of first-year undergraduate students to a self-administered web-based survey. Specifically, this study will examine the impact of those students' previous computer ownership, access, and use on their response rate. The specific research questions guiding this dissertation:

RQ1: In this sample of first-year students at American institutions of higher education, how many students have matriculated from environments in which they had substantially different patterns of Internet-connected computer ownership, access, or use?

RQ2: Do those students exhibit a significant non-response to a Web-based survey advertised primarily through e-mail?

Methodology

To answer the first question, I will construct a brief survey of previous computer ownership and use to be administered to students participating in the on-campus, paper administration of the Beginning College Survey of Student Engagement (BCSSE) (The pilot survey instrument is attached as Appendix A and notes on the construction of the instrument are in Appendix B). I will answer the second question using data from the same institutions who administer the web-based version of the National Survey of Student Engagement (NSSE). Using the BCSSE data in a linked-records approach (Porter & Whitcomb, 2005), I will be able to use logistic regression (Korkmaz & Gonyea, 2008) to see if students with less exposure to technology respond in numbers proportional to their representation.

If the population is sufficiently diverse, I expect a significant number of students will have had less experience with technology than the majority of their peers. I also expect that they will be disproportionately from lower SESes and racial/ethnic minorities. Finally, I expect to find a small but significant non-response bias on the web-based version of NSSE, a finding that may be generalizable to other web-based self-administered surveys.

References

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Appendix A

Pilot Instrument**Technology**

During the last year...

1. How often did you use an Internet-connected computer?
 - Several times a day
 - Once or twice a day
 - Several times a week
 - Once or twice a week
 - Several times a month
 - Never

2. On the computer you used most often, could you connect to all websites (i.e. was the Internet connection censored or filtered)?
 - Yes, I could connect to all websites
 - No, but I could connect to most websites
 - No, I could only connect to a few websites
 - I don't know
 - I did not use a computer to access the Internet at all

3. When you connected to the Internet on the computer you used most often, were you supervised by parents, teachers, librarians, or others?
 - No, I was always unsupervised
 - Yes, I was sometimes supervised
 - Yes, I was always supervised
 - I don't know
 - I did not use a computer to access the Internet at all

4. Did you or your family own the computer you used most often to connect to the Internet?
 - Yes, the computer belonged to just me
 - Yes, the computer belonged to my family
 - No, the computer did not belong to my family
 - I did not use a computer to access the Internet at all

5. Did you regularly use computers at multiple locations (school, home, library, etc.) to access the Internet?
 - Yes, I used computers at multiple locations
 - No, I only used computers at one location
 - I did not use a computer to access the Internet at all

6. Did you regularly use something other than a computer (mobile phone, game console, etc.) to access the Internet?
- Yes, I accessed the Internet using non-computer devices
 - No, I only accessed the Internet using a computer
 - I did not access the Internet at all
7. How will you access the Internet on a regular basis during your first year in college? (select all that apply)
- I will use my own computer
 - I will use my family's computer
 - I will use someone else's computer (friend, roommate, etc.)
 - I will use computers on campus (computer labs, library, etc.)
 - I will use something other than a computer (mobile phone, game console, etc.)
 - I will not access the Internet
 - I don't know

Demographics

8. Did you receive a Federal Pell Grant?
- Yes
 - No
 - Do not know
9. What is your sex?
- Female
 - Male
10. What is your racial or ethnic identification? (Select only one.)
- American Indian or other Native American
 - Asian, Asian American, or Pacific Islander
 - Black or African American
 - White (non-Hispanic)
 - Mexican or Mexican American
 - Puerto Rican
 - Other Hispanic or Latino
 - Multiracial
 - Other
 - I prefer not to respond
11. Please indicate whether your parents completed a 4-year college degree.

	Did not complete 4-year degree	Completed 4- year degree	Do not know
Mother (or guardian)			
Father (or guardian)			

Appendix B

Survey Instrument Construction Notes

The primary concept I am hoping to capture with this instrument is Internet access. Specific dimensions of access include: frequency, openness (i.e. filtered or unfiltered), supervision, ownership, and location. These are derived largely from qualitative work that has been conducted over the past five years, work that has explored how young people access and use the Internet (Ito et al, 2010, Palfrey & Gasser, 2008, Watkins, 2009, etc).

Originally, I hoped that a single continuous latent construct would underlie this instrument and its questions. However, it seems clear that there are multiple related but distinct sub-constructs underlying access. I believe and hope that the responses to these questions will be related such that I can – without losing too much nuance and context – combine the responses to these questions into one or two scales that are easy to understand and use.

In constructing this instrument, I looked at many other instruments that ask about computer ownership and use. These instruments were of limited utility in that nearly all focused on present computer ownership and Internet access with few questions focusing on retrospective ownership and access. Most notable among the many resources I examined are the following multi-year studies:

- ECAR Study of Undergraduate Students and Information Technology surveys (2004-2009)
- North Carolina State University ResNet surveys (1998-2009)
(http://ncsu.edu/resnet/general_info/surveys.php)
- Oxford Internet Surveys (2003, 2005, 2007)
(<http://www.oii.ox.ac.uk/microsites/oxis/methodology.cfm>)

- Pew Internet & American Life survey questions (<http://pewinternet.org/Data-Tools/Explore-Survey-Questions.aspx>)
- Stanford University Residential Computing annual surveys (2000-2009) (<http://rescomp.stanford.edu/info/survey/>)
- U.S. Bureau of Labor Statistics and Bureau of the Census Internet and computer use questionnaires (1994, 1997, 1998, 2000, 2001, 2003) (<http://www.bls.census.gov/cps/computer/computer.htm>)

The demographic questions on this pilot instrument were taken directly from the current paper version of BCSSE. These questions will not be included in cognitive interviews but they will be included in pilot administrations of this instrument. Previous research indicates that responses to most of these demographic questions should correlate to responses to the technology questions and thus provide evidence of validity. Gender should not correlate with most of these questions and will thus serve as a useful test of validity.