A Look at Mobile Device Usage Among College Students

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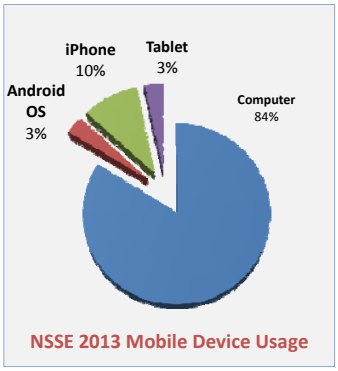
Introduction & Purpose

- Widespread adoption of mobile technologies has dramatically impacted the landscape for survey researchers (Buskirk & Andrus, 2012), and those focusing on college student populations are no exception.
- Hanley (2013) reported 92% of college students used smartphones to send and receive email messages.
- This study investigates smartphone usage among various college student demographics, and the impact this technology is having on one large survey project.

National Survey of Student Engagement

- NSSE aims to understand the curricular and co-curricular engagement of first-year and senior college students. 100+ survey items.
- Since 2000, ~ 4.5 million students from about 1,500 US and Canadian institutions participated.
- Formatted for "computer" though increasing numbers use smartphones to complete (**2011**: 4% / **2013**: 13% / **2014**:~18%).



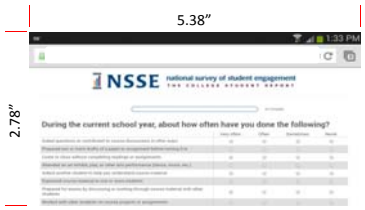
NSSE 2013 Mobile Device Usage

NSSE on Computer

Typical desktop view of survey

NSSE on Smartphone

Smartphone view using a Galaxy S3



Research Questions

1) Are there differences in respondent characteristics between smartphone and computer respondents? By smartphone type (Android OS/iPhone) as well?

2) Are there differences between smartphone and computer respondents in terms of a) completion rates, b) missing survey items and c) survey measures?

Sample & Variables

Sample

- NSSE 2013 (568 US schools)
- About 2 million invitations sent followed by up to 4 reminder messages
- 30% average institution-level response rate; partial respondents included in numerator
- 334,808 first-year and senior respondents

Variables

- Device type
  - Computer (Mac/PC)
  - Smartphone
  - Android OS
  - iPhone
  - Tablet
- Demographic characteristics
- Engagement Indicators
  - Used to estimate differences in survey estimates

Respondent Results

Are there differences in respondent characteristics between smartphone and computer respondents? By smartphone type (Android OS/iPhone) as well?

Respondent Results: Sex

	Computer (%)	Smartphone (%)	Smartphone	
			Android (%)	iPhone (%)
Female	64	65	61	66
Male	36	35	39	34

Unless otherwise noted (~), all differences between computer and smartphone categories are statistically significant using column proportions z-test with Bonferroni adjustment.

Respondent Results: First Generation College Student

	Computer (%)	Smartphone (%)	Smartphone	
			Android (%)	iPhone (%)
First generation	46	48	56	45~
Non-first generation	54	52	44	55

Unless otherwise noted (~), all differences between computer and smartphone categories are statistically significant using column proportions z-test with Bonferroni adjustment.

Respondent Results: SAT/ACT Score

	Computer (%)	Smartphone (%)	Smartphone	
			Android (%)	iPhone (%)
1,000 or lower	30	37	39	36
1,001 - 1,200	39	41	37	42
1,201 - 1,600	31	23	24	22

Unless otherwise noted (~), all differences between computer and smartphone categories are statistically significant using column proportions z-test with Bonferroni adjustment.

Respondent Results: Age

	Computer (%)	Smartphone (%)	Smartphone	
			Android (%)	iPhone (%)
19 or younger	33	35	27	38
20 - 23	38	40	36	41
24 - 29	10	14	17	12
30 or older	18	11	19	10

Unless otherwise noted (~), all differences between computer and smartphone categories are statistically significant using column proportions z-test with Bonferroni adjustment.

Respondent Results: Grades

	Computer (%)	Smartphone (%)	Smartphone	
			Android (%)	iPhone (%)
A or A-	52	46	44	47
B or B+	36	39	39	39
B- or lower	12	15	17	14

Unless otherwise noted (~), all differences between computer and smartphone categories are statistically significant using column proportions z-test with Bonferroni adjustment.

Respondent Results: Race/Ethnicity

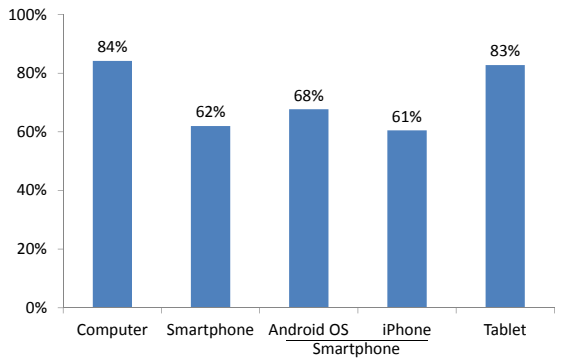
	Computer (%)	Smartphone (%)	Smartphone	
			Android (%)	iPhone (%)
Asian	6	6	5	6~
Black/African American	10	10~	15	8
Latino	9	12	14	11
White	72	71	64	73

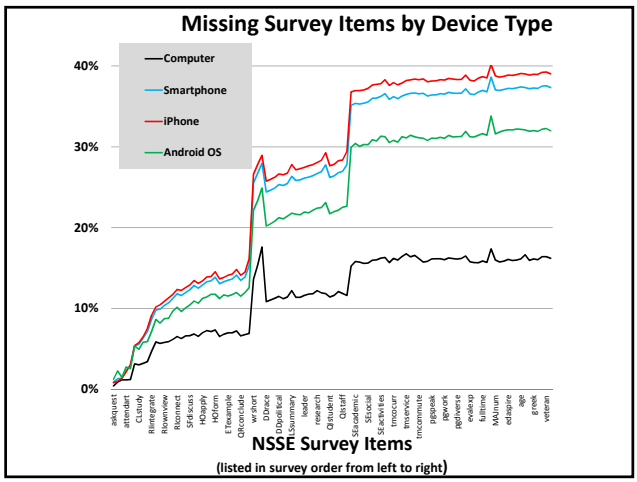
Unless otherwise noted (~), all differences between computer and smartphone categories are statistically significant using column proportions z-test with Bonferroni adjustment.

Survey Results

Are there differences between smartphone and computer respondents in terms of a) **completion rates** b) **missing survey items** and c) **survey measures**?

Completion Rates by Device Type





Survey Measures: Method

- MANCOVA used to estimate differences in survey estimates between Computer and Smartphone respondents.
- Adjusted mean differences calculated for Engagement Indicators.
- Engagement Indicator scores range from 0 to 60.
- Covariates included: undergraduate enrollment, public/private status of institution, gender, first-generation college student, class level, age, STEM, and part-time status.
- All covariates were found to be statistically significant.

Survey Measures

	Computer	Smartphone	Difference
Higher Order Thinking	41.0	40.8	**0.2**
Reflective and Integrative Learning	38.3	38.0	**0.3**
Quantitative Reasoning	28.2	29.1	**-0.9**
Student-Faculty Interactions	22.8	23.5	**-0.7**
Collaborative Learning	32.2	32.9	**-0.7**

Discussion/Implications

Research Question #1: Respondent characteristics

- Almost all respondent differences between smartphone and computer respondents were statistically significant, however meaningful differences (5% or greater) are far fewer in number.
- Smartphone users are more likely to:
  - Self-report having B+ or lower grades;
  - Be 30 years of age or older; and
  - Have lower SAT/ACT scores.
    - *Results heavily influenced by iPhone users*
- Even more meaningful differences appear by smartphone type. Compared to computer users, Android OS users are more likely to:
  - Be first-generation college students;
  - Have lower SAT/ACT scores;
  - Self-report having B+ or lower grades; and
  - Be underrepresented minority students.

Discussion/Implications

Research Question #2: Survey Results

- Completion Rates
  - Big rate gap between computer and smartphone devices that cannot be ignored. Why does Android OS show a higher rate than iPhone?
  - Additional evidence that tablet user experience is extremely similar to larger screen computer users.
- Missing Survey Items
  - Driven by survey break-off, not item non-response.
  - Very meaningful differences exist between computer and smartphone respondents for the last 2/3 of NSSE, ranging between 15% and 25%.
  - Differences exist earlier on in the survey, but not as striking.
  - **Mobile optimization experiments necessary for NSSE, and probably others**: important to short surveys but critical to long ones that can't be shortened.
- Survey Responses
  - Good news: no meaningful differences, though unknown at the item level.
  - Results are consistent with several other studies (Peytchev & Hill 2010, Mavletova 2013, DeBruigne & Wijnant 2013).

Thank you!

Copy of this and past presentations can be found at:

http://nsse.iub.edu/html/pubs.cfm

Additional NSSE information can be found at:
nsse.iub.edu

Feel free to contact us with any questions regarding this study or NSSE.

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