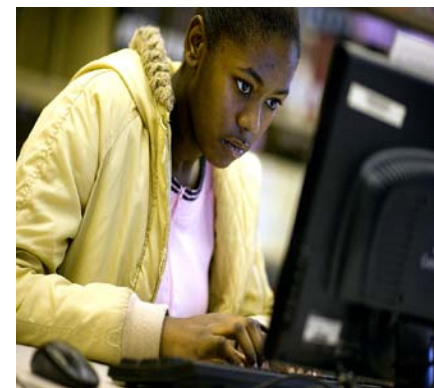


Interactive Technology and Effective Educational Practices



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Overview

- Review of literature
- Purpose
- Methods
- Results
- Discussion
- Implications for future research





Technology as an Area of Interest

- **Accessibility**
- **Creating and sharing information**
 - Information technology
 - Web 2.0 tools
 - Course management systems
 - Instructional technology
- **Impact on the college student experience**





Outcomes linked to Interactive Technology

Course-level findings

- **Creativity and critical thinking** (Fitzpatrick, 2004)
- **Comprehension** (Shapiro, 2009; Bain and Przybyla, 2009)
- **Reflective and integrative learning** (Downes, 2004)
- **Active and collaborative learning** (Klein, 2009)
- **Achievement** (Bain and Przybyla, 2009)
- **Participation and attendance** (Fitzpatrick, 2004; Shapiro, 2009)





Student Uses of Interactive Technology

Large scale studies

Findings from 2005 and 2007 ECAR studies

- Limited use
- Preference
 - Gender and age
- Face-to-face interactions with faculty

(Kvavik & Causo, 2005; Salaway, Caruso, & Nelson, 2007)



Technology and Student Engagement

Large scale studies

- **Computer use** (Kuh & Vesper, 1999)
- **Information technology** (Kuh & Shouping, 2001; NSSE, 2003)
- **Distance learners** (NSSE, 2006; Chen, Gonyea, & Kuh, 2008)
- **Time spent online** (Nelson Laird, 2004)



Purpose

To identify subpopulations of students who are frequent users of interactive learning technologies as well as to determine if frequent use of interactive tools, in relation to academic work, had a positive or negative effect on students' engagement in effective educational practices.



Research Questions

1. **What types of interactive technology are used most and least often by first-year and senior students?**
2. **How does the use of these technologies vary by subpopulations?**
3. **How does student use of interactive technology relate to educationally effective student engagement?**



Data Source

National Survey of Student Engagement 2009

- Randomly sampled first-year and senior students
- 640 baccalaureate degree-granting institutions from US and Canada
- Over 375,000 respondents

Technology extra item set

- 58 institutions
- 31,000 respondents





Interactive Technology Scale

During the current school year, about how often did you use...in your courses?

Response set: Very often, Often, Sometimes, Never, I don't know what this is

1. Student response systems ("clickers")
2. Online portfolios
3. Blogs
4. Collaborative editing software (Wikis, Google Docs)
5. Online student video projects (using YouTube, etc.)
6. Video games, simulations, or virtual worlds
7. Instant messaging/chat room
8. Online survey tools
9. Videoconferencing or internet phone chat (Skype, etc.)

Sample Characteristics

Class rank

- 48% first-years (n=10,163)
- 52% seniors (n=11,128)

58 Institutions

- Doctoral (FY: 37%; SR: 42%)
- 36% Master's
- Private (FY: 56%; SR: 50%)

Demographics

- 65% Women
- 75% White
- 33% First-gen
- Full-time (FY: 94%; SR: 83%)
- 23 or younger (FY: 93%; SR: 65%)
- Living on campus (FY:73%; SR: 39%)

Academic Majors

13% Arts & Hum

20% Business

13% Professional

10% Education

12% Social Sciences

8% Biological Sciences

5% Engineering

4% Physical Sciences

17% Other



Analyses

Q 1 . What types of interactive technology are used most and least often by first-year and senior students?

- **Frequencies**

Q 2. How does the use of these technologies vary by subpopulations?

- **t-tests or ANOVAs**





Analyses

Q 3. How does student use of interactive technologies relate to educationally effective student engagement?

- **OLS regressions for first-years and seniors**
- **Standardized before entry in models**
- **Controlled for student and institutional characteristics**
- **IV: Interactive Technology scale, DV: NSSE benchmarks**



Dependent Variables

NSSE benchmarks of effective educational practice

- **Academic Challenge (FY=.73; SR=.76)**
- **Active & Collaborative Learning (FY=.66; SR=.66)**
- **Student-Faculty Interaction (FY=.71; SR=.74)**
- **Supportive Campus Environment (FY=.79; SR=.80)**



Independent Variables

- **Interactive Technology scale (FY=.85; SR=.84)**
- **Student-level and institution-level controls:**
 - Gender, first-generation status, age, citizenship, transfer status, enrollment status, fraternity/sorority, living situation, race/ethnicity, primary major field, grades
 - Private/public control, Carnegie classification





Interactive Technologies

- **Student response systems (“clickers”)**
- **Online portfolios**
- **Blogs**
- **Collaborative editing software (Wikis, Google Docs)**
- **Online student video projects (using YouTube, etc.)**
- **Video games, simulations, or virtual worlds**
- **Instant messaging/chat room**
- **Online survey tools**
- **Videoconferencing or internet phone chat (Skype, etc.)**

Most Often Used

Percent of students' frequent use ("often" or "very often")

	First-Year	Senior
Collaborative editing software	28%	22%
Student response systems	26%	16%
Online student video projects	19%	15%
Instant messaging/chat room	12%	13%
Online portfolios	12%	12%

- Generally more use by first-year students
- Collaborative editing software most often used by both classes
- Largest difference between classes--student response systems



Least Often Used

Percent of students' frequent use ("often" or "very often")

	First-Year	Senior
Video games, simulations, or virtual worlds	5%	5%
Videoconferencing or internet phone chat	6%	4%
Blogs	9%	7%
Online survey tools	9%	8%

- Video games, simulations, or virtual worlds are the least often used technology
- Very little difference between classes



Subpopulation Differences: No Significance Or Trivial Effect

First-Years

Student-level

- Age
- Enrollment status
- Fraternity/sorority
- Transfer status
- First-generation status
- Campus-living situation

Institution-level

- Private/public control

Seniors

Student-level

- Age
- Enrollment status
- Fraternity/sorority
- Transfer status
- Gender
- Student-athlete status

Institution-level

- Private/public control



Subpopulation Differences: More Frequent Use

First-Years

Small effect sizes

Student-level

- Males
- Student-athletes

Medium effect sizes

Student-level

- At least some classes online
- International or foreign national

Seniors

Small effect sizes

Student-level

- First-generation
- Living in driving distance

Medium effect sizes

Student-level

- At least some classes online
- International or foreign national



Subpopulation Differences

Students with more frequent use:

- Lower grades (mostly B's or C's)
- Racial/ethnic minority, particularly Asian
- Professional, Business, or Education
 - Arts & Humanities, Physical Science, and Engineering had least use
- At doctoral-granting institutions



Technology and Engagement

Relationships Between Interactive Technology and NSSE Engagement

	First-Year	Senior
Supportive Campus Environment	++	++
Level of Academic Challenge	++	++
Active and Collaborative Learning	+++	++
Student-Faculty Interaction	+++	+++

- Relationships are slightly stronger for first-year students
- Strongest relationship between Interactive Technology use and Student-Faculty Interaction

Models used all student-level and institution-level controls. All variables were standardized before entry into models.
Key: ++ $p < .001$ and unstandardized B $> .2$; +++ $p < .001$ and unstandardized B $> .3$.



What Did We Learn?

- **These technologies are relatively unused**
 - Continue surveying to look for increased use
- **Some surprising demographic differences**
 - No difference by age
 - Noticeable difference for international/foreign national students
 - More use by Business or Professional students, less use by Engineering or Physical Science students
- **Strongest relationship between interactive technology use and Student-Faculty Interaction, particularly for first-years**



Future Research

- Look at individual technologies within the Interactive Technology scale
- After establishing frequency of use, focus on best pedagogical practices
 - Consider starting with collaborative editing software
- Examine how a student's propensity to adopt a technology affects relationships with engagement



Questions?

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