Students and Information Technology, 2005: Convenience, Connection, Control, and Learning

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Questions

- What kinds of information technologies do students use?
- What are students' skill levels with these technologies?
- How does student use of information and communications technologies contribute to their undergraduate experience?, and
- What contribution does using information technology make to students' learning?

Methodology

- Literature review
- Review of other higher education IT surveys
- Quantitative survey of 18,039 freshman and seniors - 63 institutions
- Analysis of comments of over 8,000 students to open-ended questions on use of IT
- Comparison of 11 institutions in both 2004 and 2005 studies

The ECAR Framework

Quadrant 1: **Convenience**	**Quadrant 2:** **Connection**
Quadrant 3: **Control**	**Quadrant 4:** **Learning**

Characteristics of Respondents

- 34% are male; 66% female
- 44% are freshmen; 56% seniors
- 87% are 25 years or younger
- 92% are full-time students
- 47% live on campus
- 75% have a B or better GPA
- 13% are from BA institutions; 37% from MA institutions; 49% from doctoral institutions; and 1% AA and other

We achieved a 99% level of confidence with a +/- .02 margin of error.

Students are Equipped with Technology

Technology Owned	Percent Owned by Seniors	Percent Owned by Freshmen	Overall Percent Owned
Personal desktop	70.1%	50.9%	61.6%
Laptop	49.3%	63.5%	55.6%
PDA	15.5%	9.0%	12.6%
Smart phone	1.4%	1.2%	1.3%
Cell phone	90.5%	89.7%	90.1%
Music device	34.3%	43.5%	38.4%
Wireless adapter	26.4%	22.8%	24.8%

96% of all students in this study own a computer and over 90% have access to broadband. Male students win the gadget race!

IT Applications Used

Activity	N	Senior	Freshman	Total
Creating, reading, sending e-mail	17,865	99.7%	99.7%	99.7%
Writing documents for your coursework	17,902	99.1%	98.7%	98.9%
Surfing the Internet for information to support your coursework	17,936	98.7%	98.1%	98.4%
Class activities and studying using an electronic device	17,961	96.4%	96.0%	96.2%
Surfing the Internet for pleasure	17,925	94.7%	95.0%	94.8%
Using a library resource to complete a course assignment	17,960	88.8%	86.9%	88.0%
Creating, reading, sending instant messages	17,782	74.2%	89.7%	81.1%
Downloading or listening to music or videos/DVDs	17,891	68.2%	83.8%	75.1%
Online shopping	17,905	77.2%	65.3%	71.9%

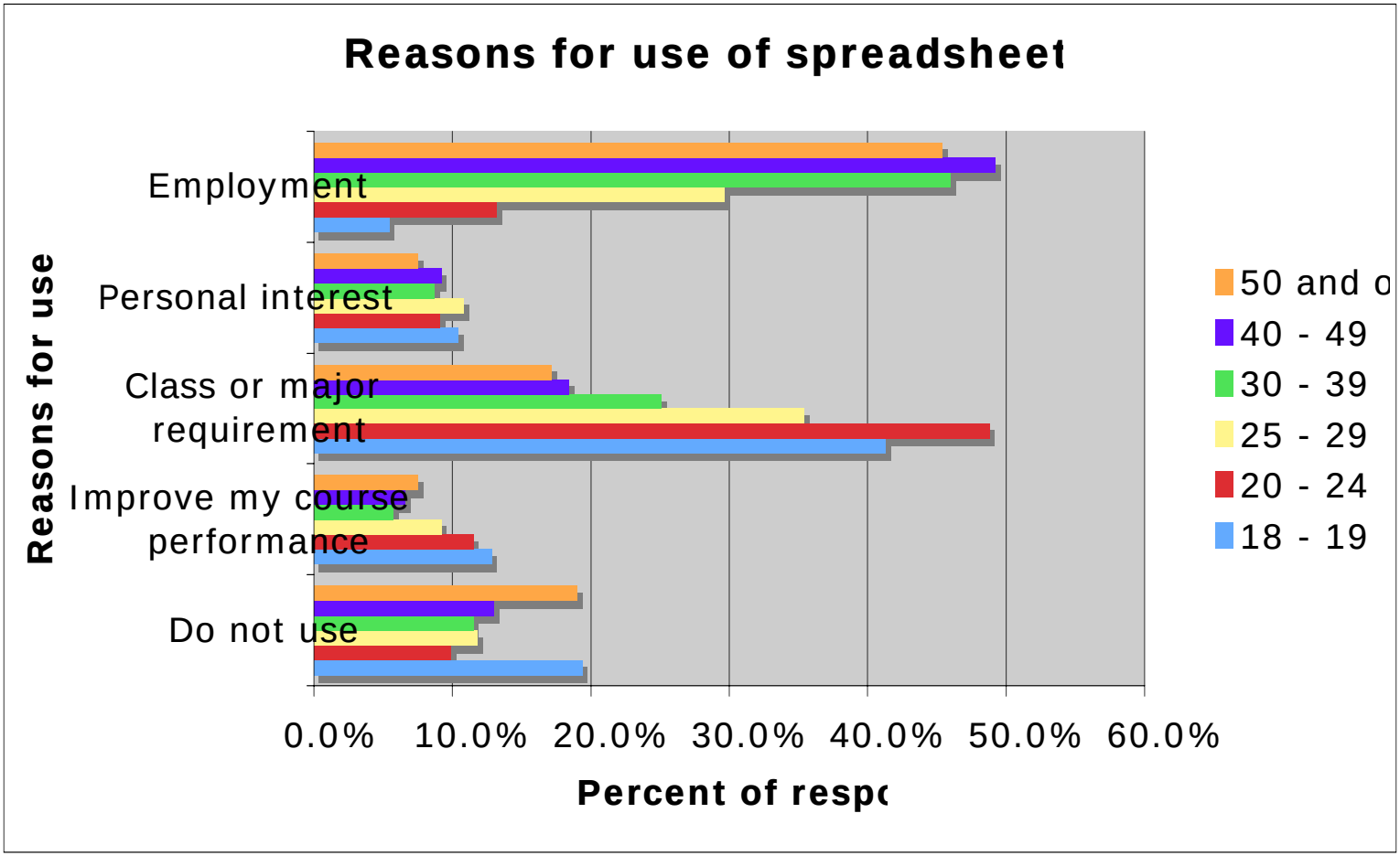
Electronic devices -used first for coursework, then for communication, and recreation.

IT Applications Used (cont.)

Activity	Senior	Freshman	Total
Creating presentations	73.2%	54.6%	65.0%
Completing a learning activity using a CMS	64.6%	61.9%	63.4%
Creating spreadsheets or charts	71.2%	51.7%	62.5%
Playing computer games	57.3%	64.9%	60.7%
Writing documents for pleasure	59.3%	61.9%	60.4%
Creating graphics	49.3%	47.2%	48.7%
Creating Web pages	26.1%	23.4%	24.9%
Creating and editing video/audio	23.4%	25.0%	24.1%

Specialized applications are used least.

Reasons for Use of Spreadsheets



Primary reason for spreadsheet use is class requirement for 20-24 year olds (48.8%) and employment for 40-49 year olds (49.2%)

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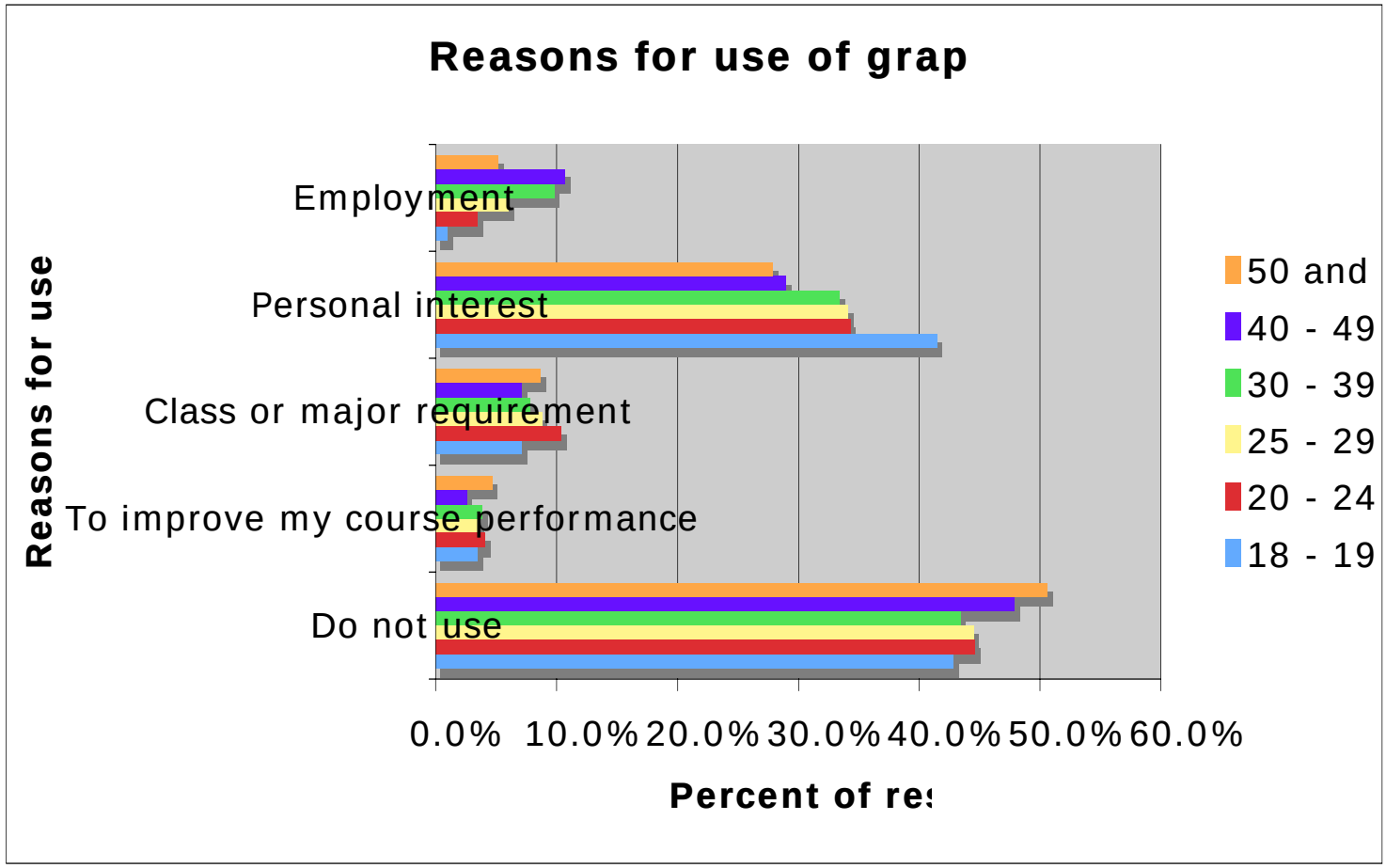
Reasons for Use of Graphics



Primary reason for use of graphics software is personal interest among 18-19 year olds

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Use of Specialized Applications by Major

Major	Spreadsheets	Presentations	Graphics	Create video/audio	Create Web pages
Engineering/computer science (N = 1,901)	79.3%	74.5%	63.9%	38.6%	46.1%
Business (N = 3,193)	78.5%	78.6%	50.6%	25.3%	27.5%
Physical sciences (N = 1,337)	76.2%	67.2%	50.5%	24.0%	22.9%
Life sciences (N = 2,729)	67.9%	68.1%	46.1%	19.4%	18.1%
Social sciences (N = 3,348)	57.6%	62.2%	43.9%	20.6%	21.3%
Education (N = 2,507)	54.9%	66.4%	48.9%	22.1%	26.0%
Humanities (N = 1,954)	52.0%	58.0%	43.6%	22.4%	22.8%
Fine arts (N = 1,369)	47.6%	54.5%	51.8%	30.3%	27.4%

Academic major is strongly associated with application usage.

Engineering/computer science majors are the 'power users.'

IT Applications & Hours/Week Used

Activity	N	Hours used on average
Excluding cell phones, hours each week using an electronic device	17964	11-15 hours
Course activities and studying using electronic device	17281	3-5 hours
Writing documents for your coursework	17701	3-5 hours
Creating, reading, sending instant messages	14421	3-5 hours
Creating, reading, sending e-mail	17811	1-2 hours
Surfing the Internet for pleasure	16996	1-2 hours
Surfing the Internet for information to support your coursework	17652	1-2 hours
Downloading or listening to music or videos/DVDs	13437	1-2 hours
Playing computer games	10836	1-2 hours
Using a course using course management systems	11356	1-2 hours

Electronic devices - used first for coursework, then for communication, and recreation

IT Applications & Hours/Week Used (cont.)

Activity	N	Hours used on average
Using a library resource to complete a course assignment	15798	Less than one hour
Online shopping	12876	Less than one hour
Creating spreadsheets or charts (Excel™)	11214	Less than one hour
Creating presentations (PowerPoint™)	11636	Less than one hour
Writing documents for pleasure	10773	Less than one hour
Creating graphics (Photoshop™, Flash™)	8680	Less than one hour
Creating Web pages (Dreamweaver™, FrontPage™)	4438	Less than one hour
Creating and editing video/audio (Director™, iMovie™)	4303	Less than one hour

Students spend a lot of time on-line.

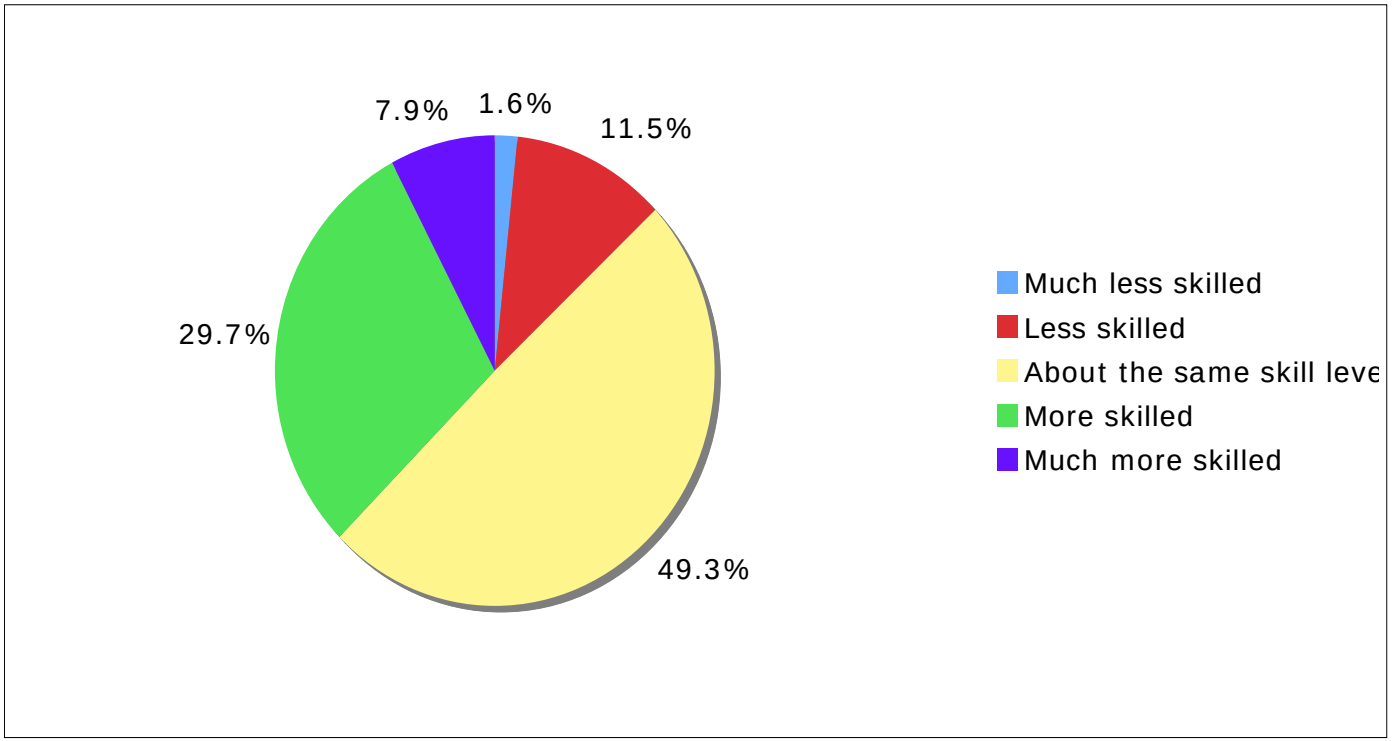
Level of Skills Attained

Activity	Mean
Word processing (Word)	3.52
Computer operating systems (Windows, OSX)	3.04
Presentation software (PowerPoint™)	2.98
Spreadsheets (Excel™)	2.88
Online library resources	2.85
Course management systems	2.67
Computer maintenance	2.47
Securing your electronic device (firewalls, antivirus software)	2.47
Graphics (Photoshop™, Flash™)	2.40
Creating Web pages (Dreamweaver™, FrontPage™)	2.14
Creating and editing video/audio (Director™, iMovie™)	2.01

Scale: 1 = Very unskilled; 2 = Unskilled; 3 = Skilled; 4 = Very Skilled

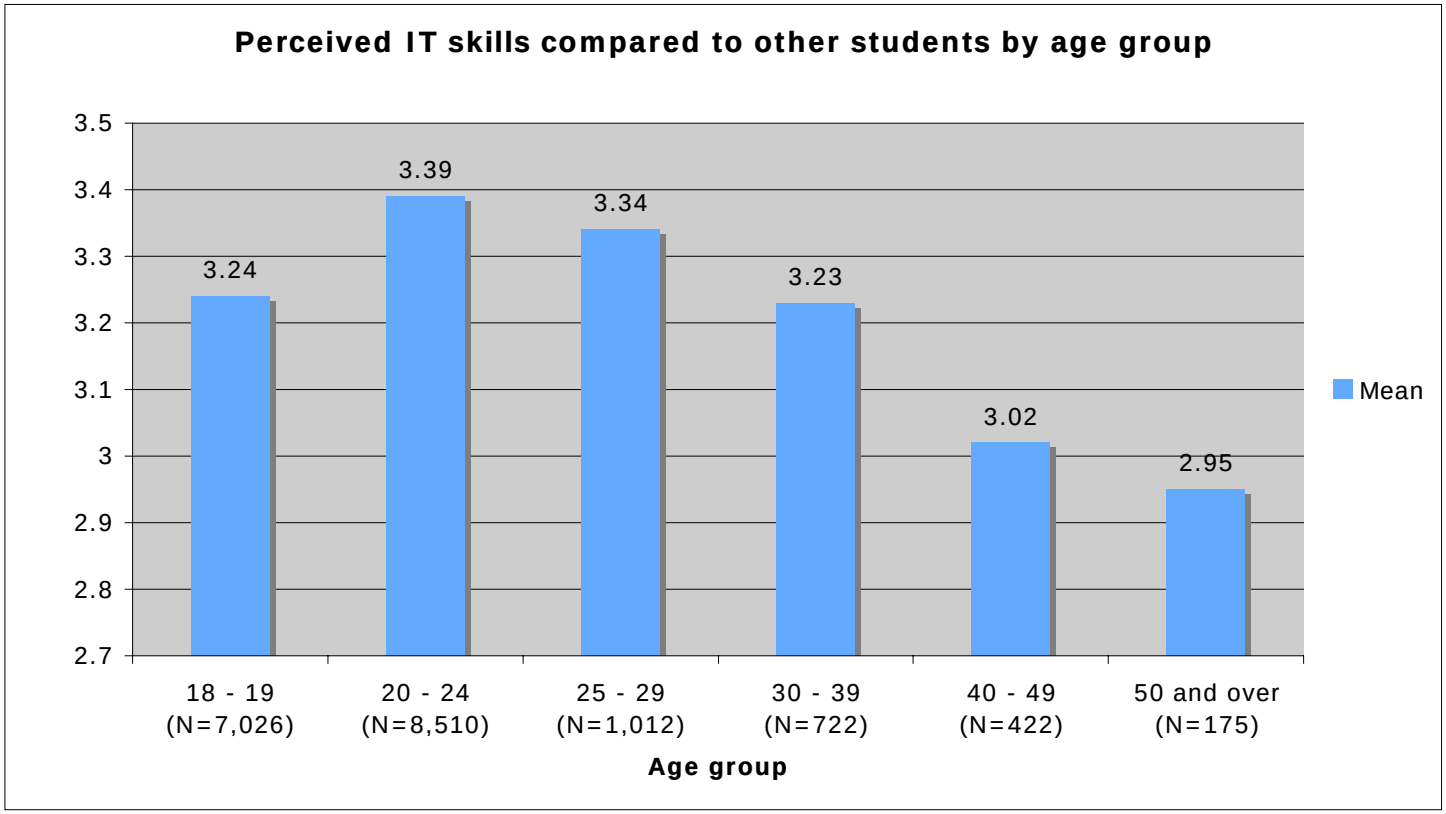
Students overestimate their skills but are cognizant of their lack of skills in specialized apps.

Perceived IT Skill in Comparison with Other Students



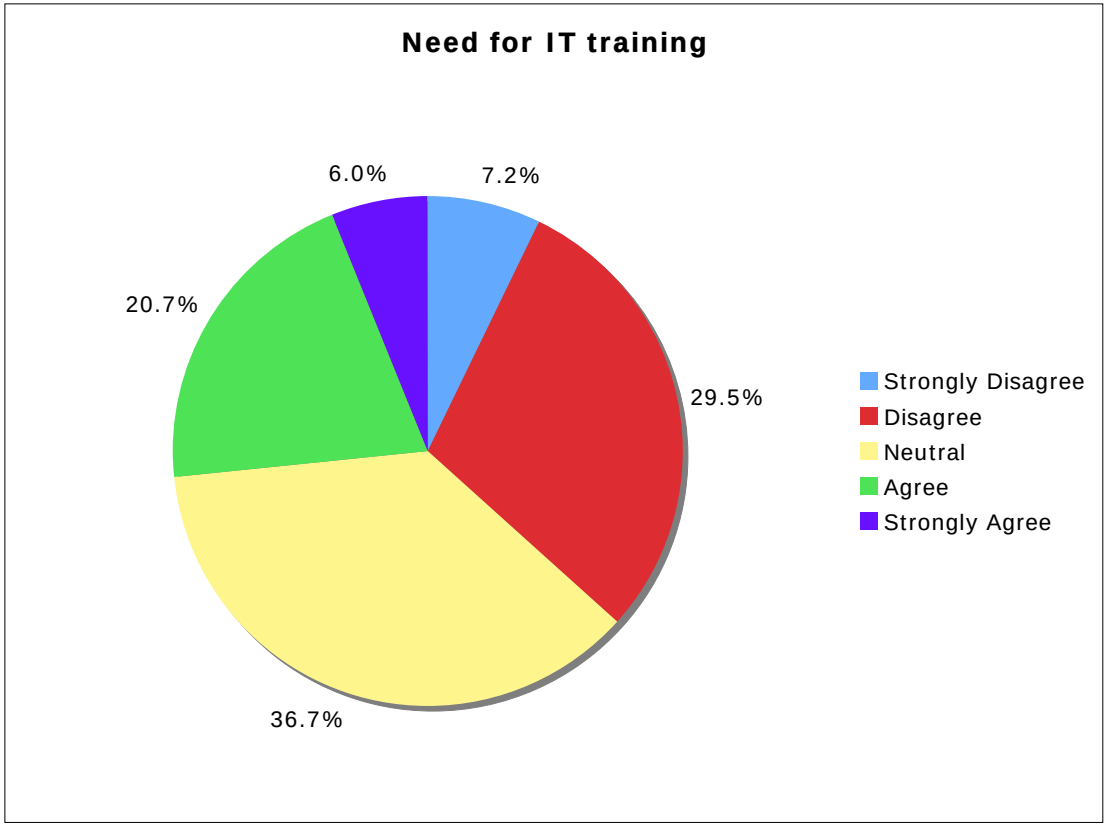
Almost 38% of students consider themselves more skilled than other students. Almost half consider themselves at the same skill level.

Perceived IT Skill by Age



Students 20-24 years old consider themselves the most skilled when compared to their peers. Those age 50 and over consider themselves less skilled than their peers.

Need for Training



73% percent of students say they need no training.

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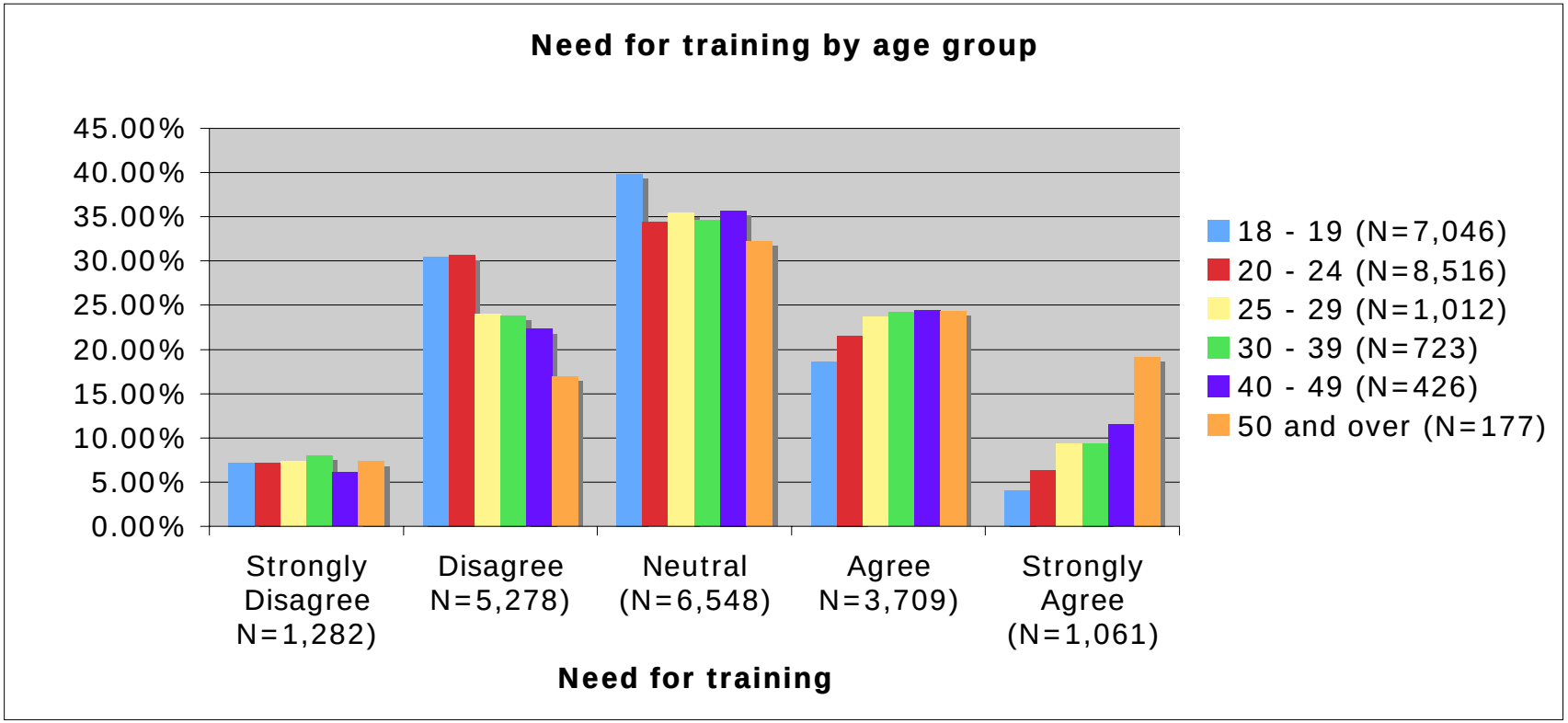
Need for training by Age Group



Older students want the most training but they also say they are more skilled.

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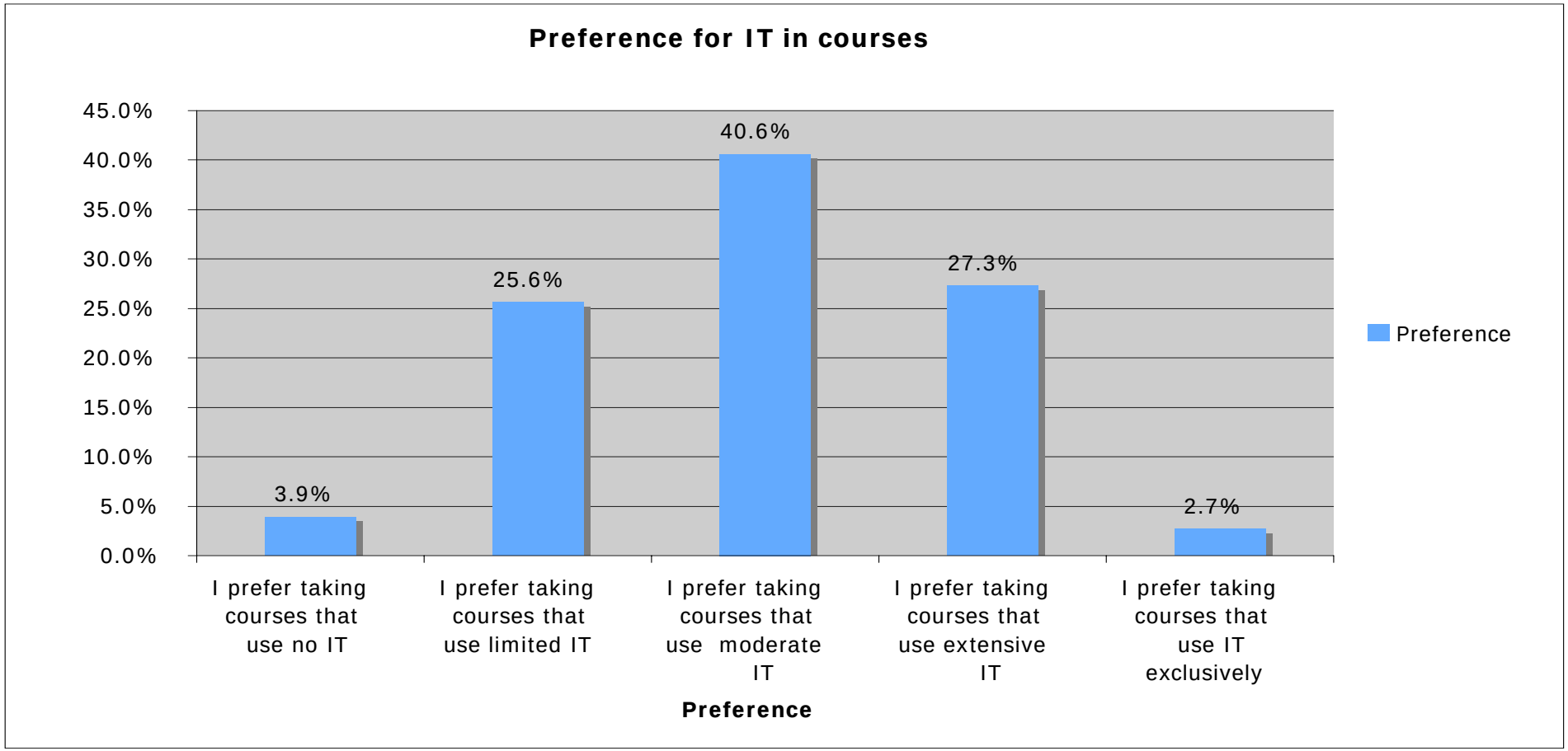
Student Concerns

Concerns	Mean
Computer viruses, worms, or Trojan horses	2.71
Spam	2.55
Slow or inadequate network access	2.48
My technical skill level in troubleshooting my computer	2.18
The age of my computer hardware and software	2.10
Inadequate access to printing	2.04
Inadequate technical assistance and help available to me on campus	2.04

Scale: 1 = Not a concern; 2 = Small concern; 3 = Significant concern; 4 = Major concern

Preference for IT in Courses



Students view technology in the classroom as supplemental to their course experience and not as transformational.

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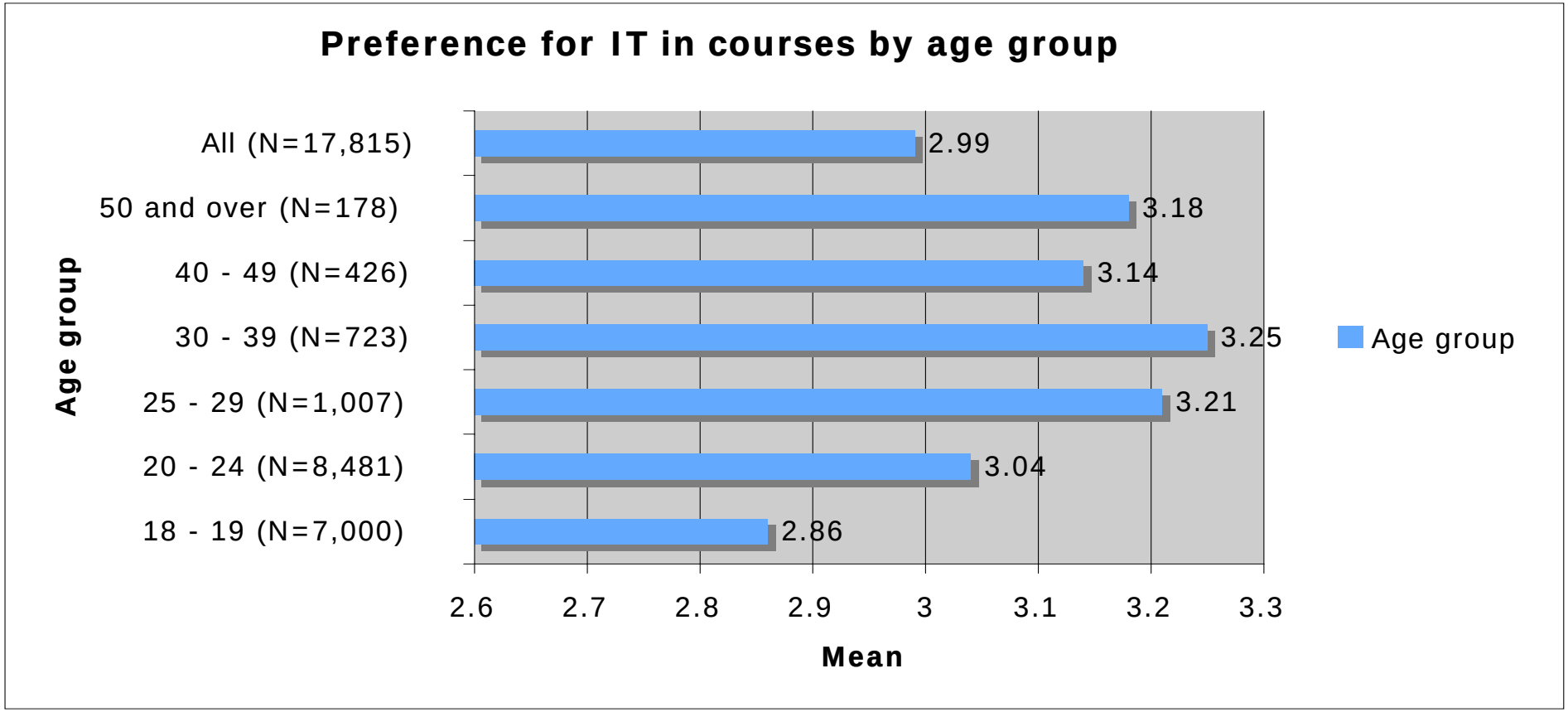
Preference for IT in Courses by Age Group



The youngest students in our survey had the lowest preference for IT in courses.

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Preference for IT in Courses by Major

Discipline	N	No IT	Limited IT	Moderate IT	Extensive IT	Exclusive IT	Mean
Engineering	1880	1.5%	11.8%	34.0%	48.4%	4.4%	3.42
Business	3162	2.3%	18.2%	41.5%	34.2%	3.8%	3.19
Life Sciences	2698	2.8%	24.4%	41.7%	28.9%	2.2%	3.03
Physical Sciences	1330	3.7%	25.8%	43.8%	25.4%	1.4%	2.98
Education	2483	3.3%	30.2%	43.9%	20.4%	2.2%	2.88
Social Sciences	3327	4.7%	30.4%	40.9%	22.0%	2.1%	2.86
Fine Arts	1354	6.1%	30.1%	38.1%	23.0%	2.4%	2.85
Humanities	1934	5.7%	35.2%	40.1%	17.2%	1.4%	2.73

Engineering and business students have the highest preference for IT in courses.

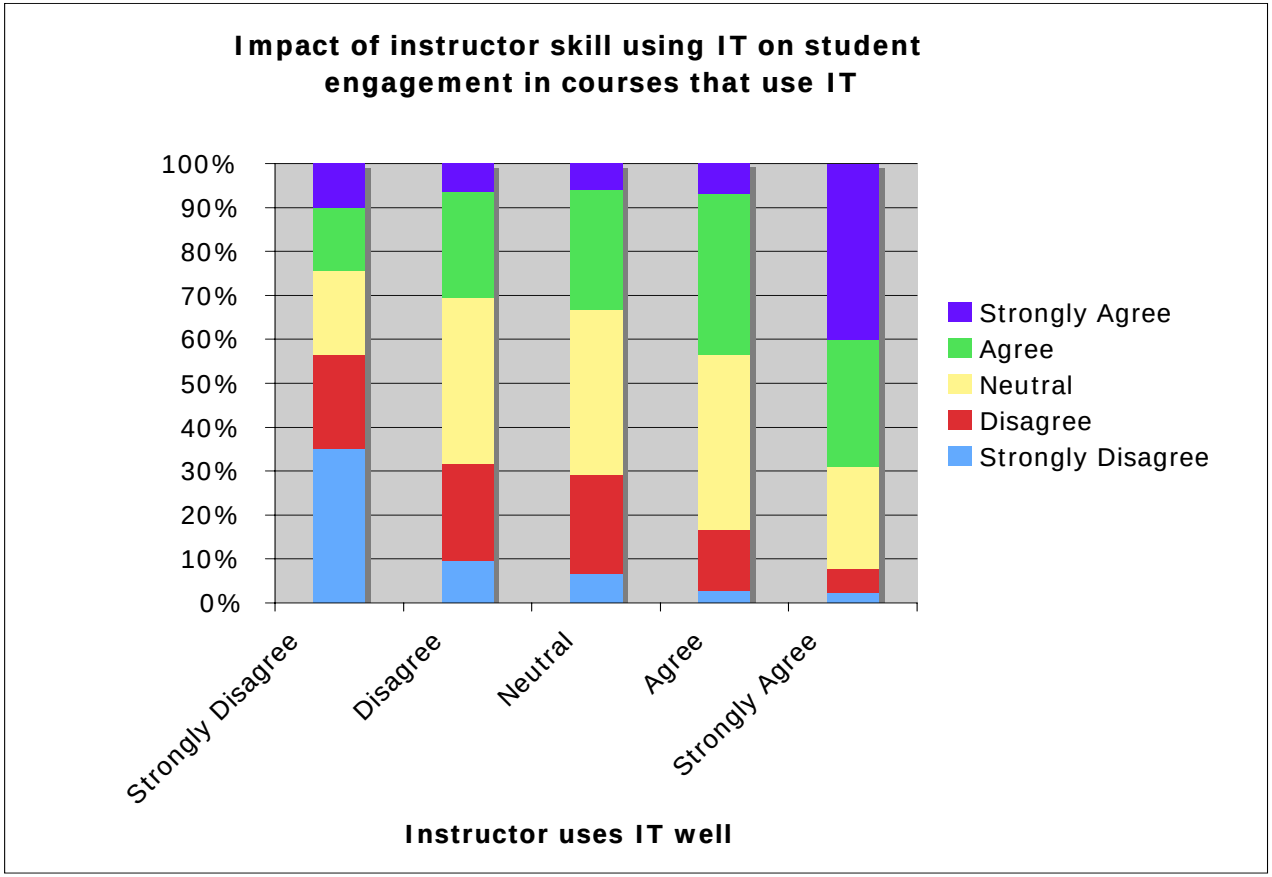
Impact of IT in Courses

Impact	Mean
The use of IT in courses has helped me better communicate with my instructors.	3.89
The use of IT in courses has resulted in prompt feedback from my instructors.	3.77
The use of IT in courses has helped me better communicate and collaborate with my classmates.	3.70
I primarily use IT in courses to improve the presentation of my work.	3.56
Courses that use IT allow me to take greater control of my course activities.	3.51
The use of IT in courses has helped me better understand complex or abstract concepts.	3.23
I am more engaged in courses that require me to use technology.	3.21
The instructors' use of technology in my courses has increased my interest in the subject matter.	3.14

Scale = 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

Technology facilitates student communications and academic feedback.

Impact of Instructor IT Skill on Student Engagement



Students who agree or strongly agree that they are more engaged in courses that use IT also rate the instructors as skilled with IT. For those students who disagree or strongly disagree re. engagement, they rate their instructors as less skilled IT.

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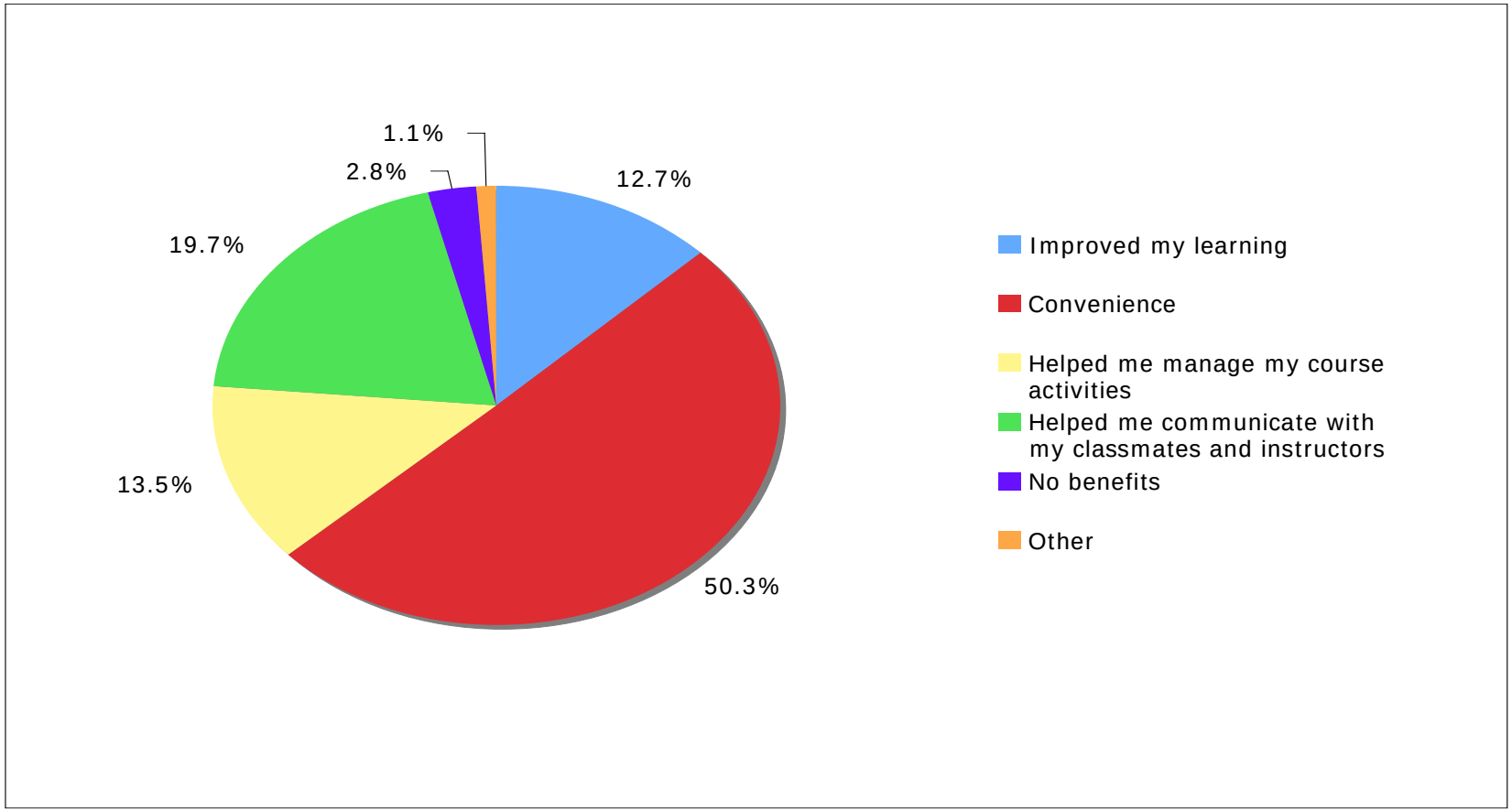
Most Valuable Benefit of IT in Courses



Students rate convenience 1st, helped communicate with classmates and instructors 2nd, helped manage course activities 3rd, and improve learning 4th

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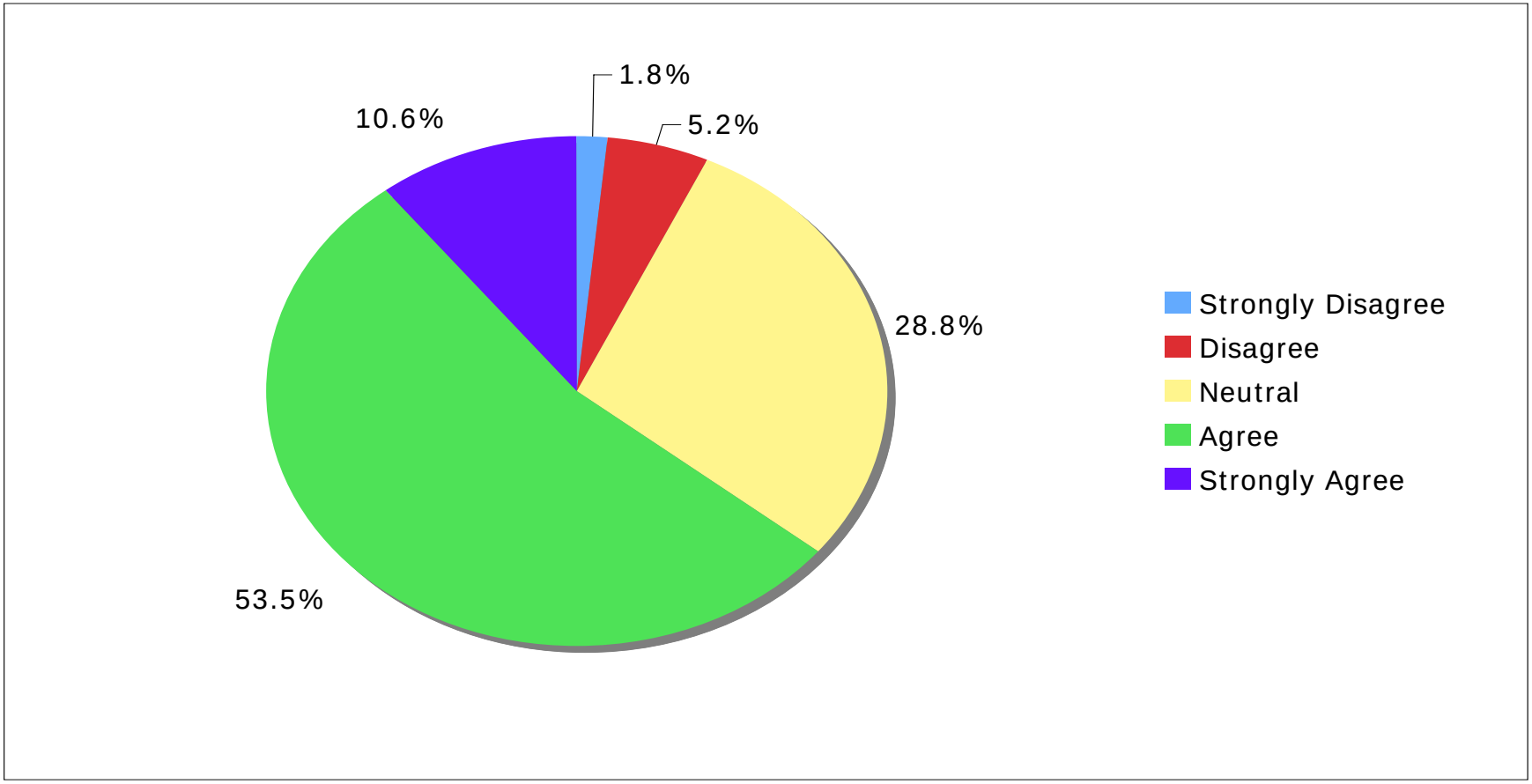
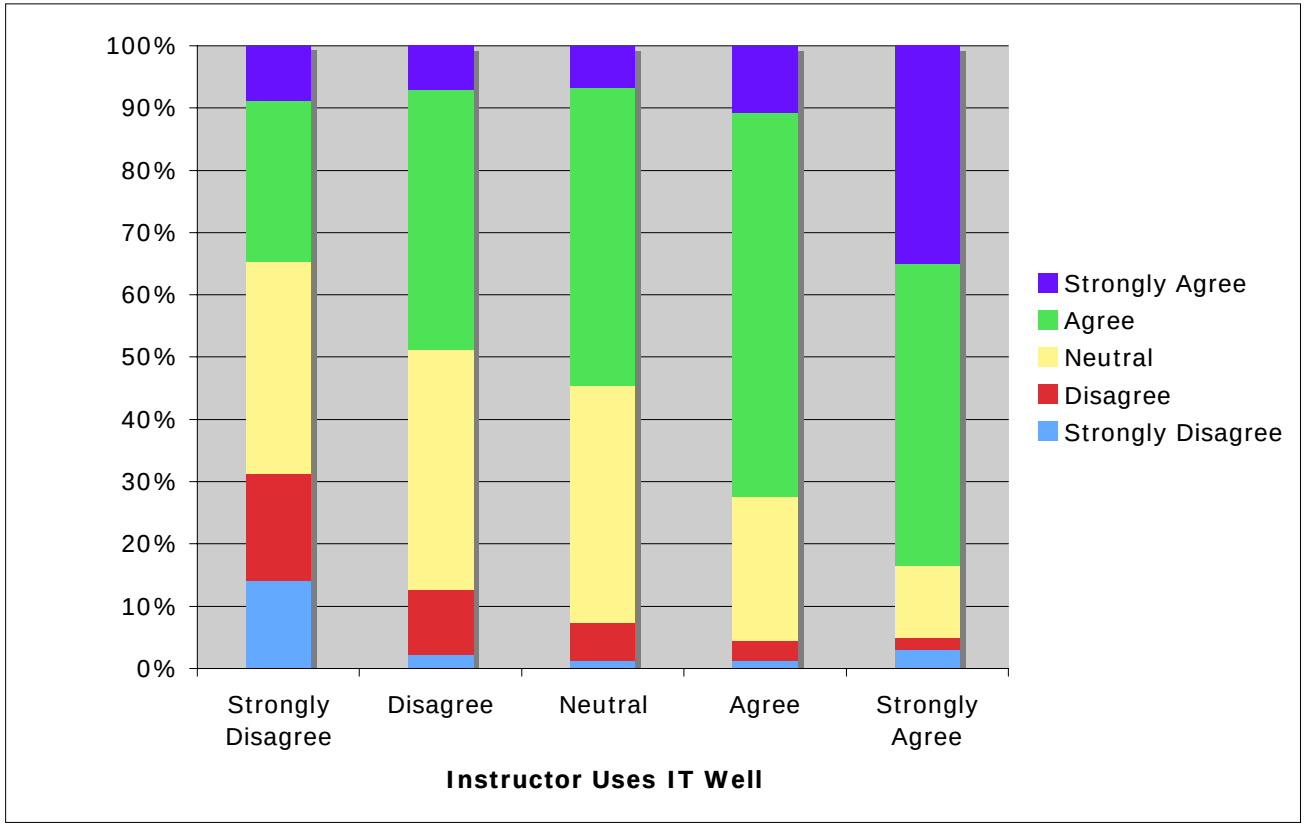
IT in Courses Improves Learning



More than 82% of the students agree or strongly agree that IT in courses improves learning.

Impact of Instructor on Learning



Students who rate their instructors as skilled with IT also agree or strongly agree that IT in courses improves learning.

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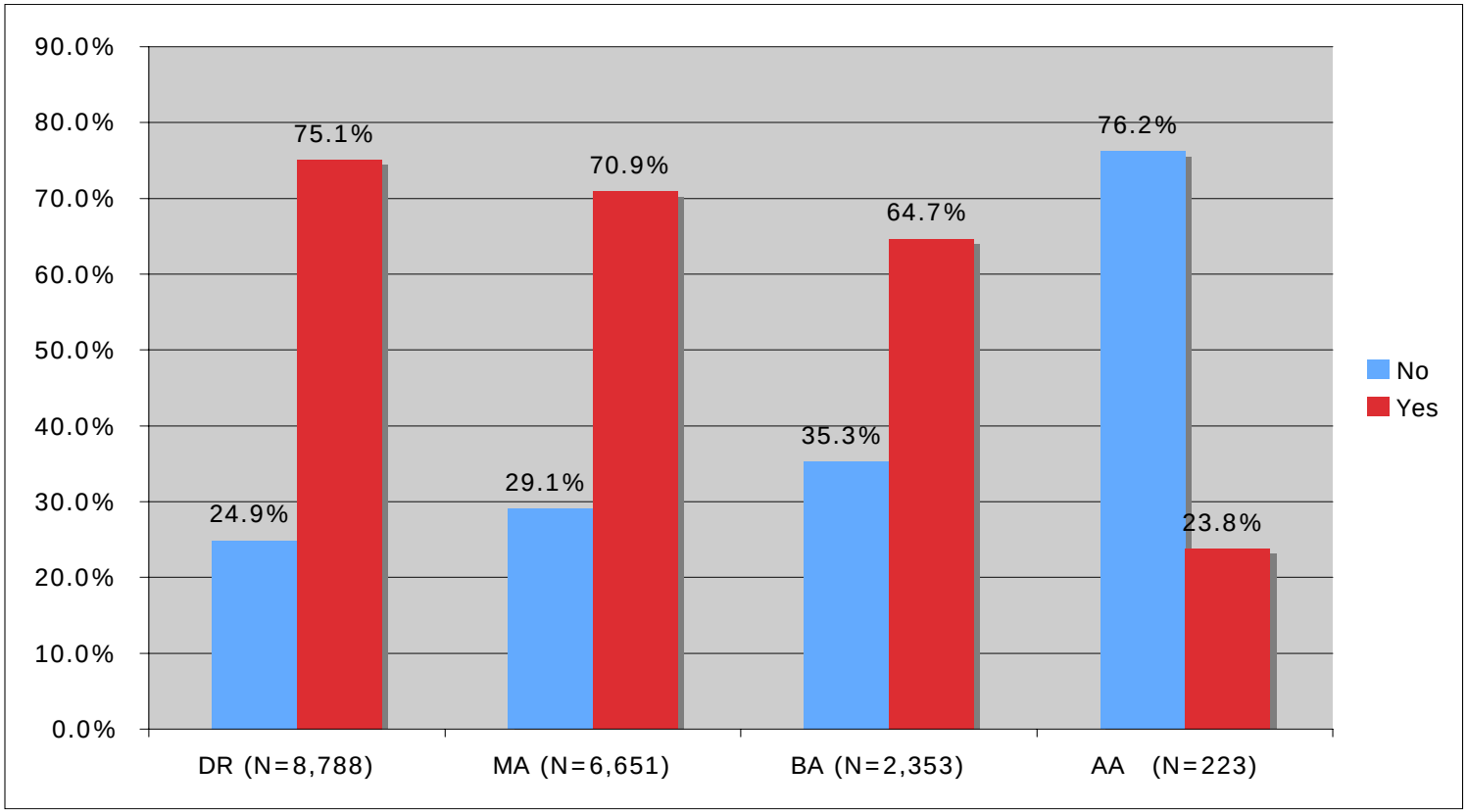
CMS Use by Carnegie Class



More than 75% of the students at R1 institutions have taken a course using a CMS, 71% for master's, 65% for BAs, and 24% for AAs.

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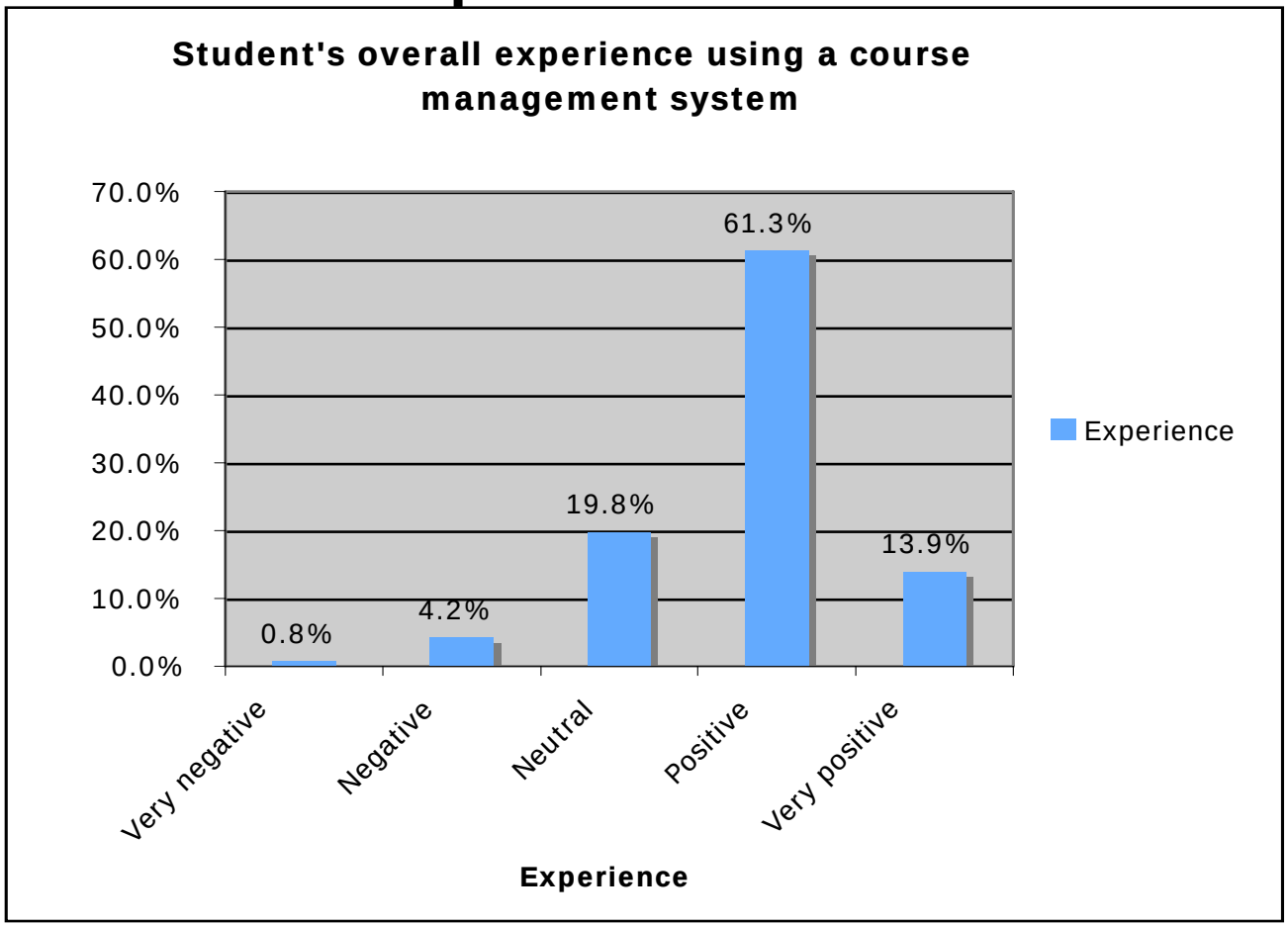
Student Experience with a CMS



More than 75% of the students report a positive experience with CMS.

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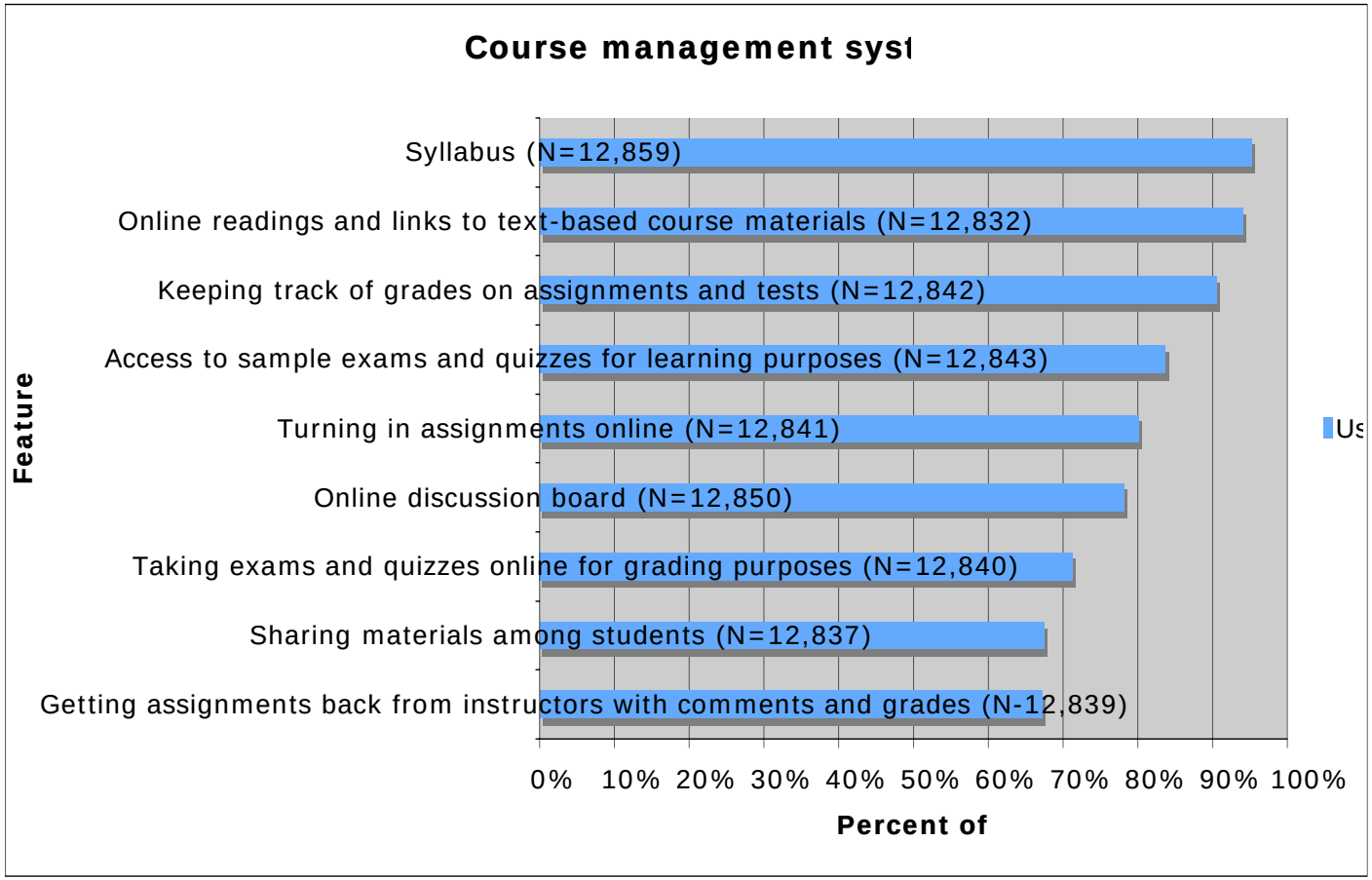
CMS Features Used



Students primarily use syllabus, online readings, grades, sample exams and quizzes, and turning in assignments.

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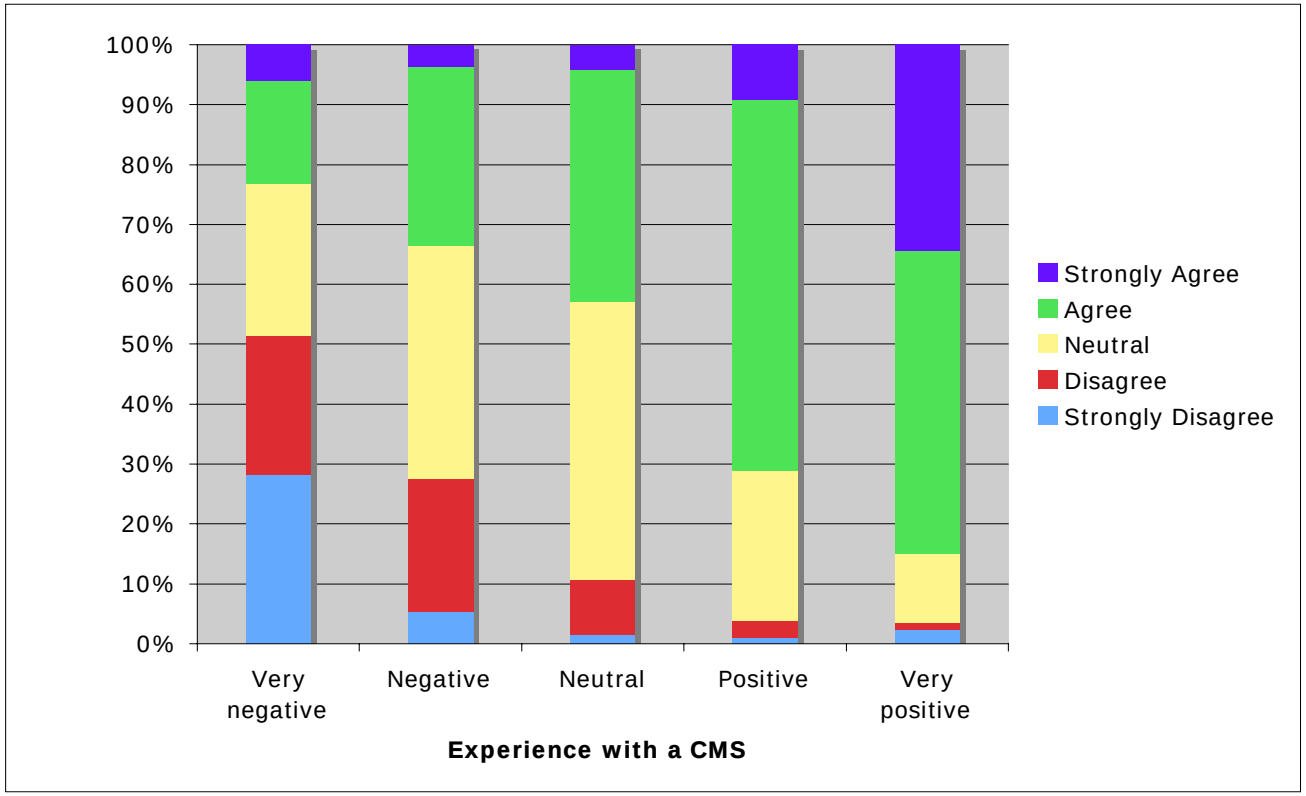
CMS Features Most Valued

Feature	Mean
Keeping track of grades on assignments and tests	2.57
Access to sample exams and quizzes for learning purposes	2.50
Syllabus	2.36
Turning in assignments online	2.27
Getting assignments back from instructors with comments and grades	2.27
Online readings and links to text-based course materials	2.25
Taking exams and quizzes online for grading purposes	2.18
Sharing materials among students	2.09
Online discussion board	1.86

Scale: 1 = Not valuable, 2 = Valuable, 3 = Very valuable

Students find keeping track of grades most valuable, followed by sample exams, syllabus, and turning in assignments online. All features they find at least valuable (2.0) except online discussion board.

CMS Experience and Learning



Students who report a positive or very positive experience with a CMS also agree or strongly agree that IT improves learning.

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Recommendations

- Integration of IT into the curriculum
- Definition of IT skills,
- Training for students and faculty,
- Consistent use of IT
- IT service and support, and
- Monitoring

Questions and comments

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