The vexing issue of laptop and smartphone use in class

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UCITE
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Questions this session will address

- How *frequently* are students using laptops and smartphones in class?
- How much *time* are they spending on them?
- What are they using them *for*?
- *Why* are they doing this?
- Why *shouldn't* they be doing this?
- What can *instructors* do about it?

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Frequency of student device use

In Class for Non-Class Purposes *Per Day*:

Never (7.9%)
1-3 times (34.9%)
4-10 times (26.8%)
11-30 times (15.7%)
More than 30 times (14.8%)
Average use was 11 times per day

(Based on survey of 777 students at six universities, Bernard McCoy, JoME, October 2013, p. 5-14 http://en.calameo.com/read/000091789af53ca4e647f)

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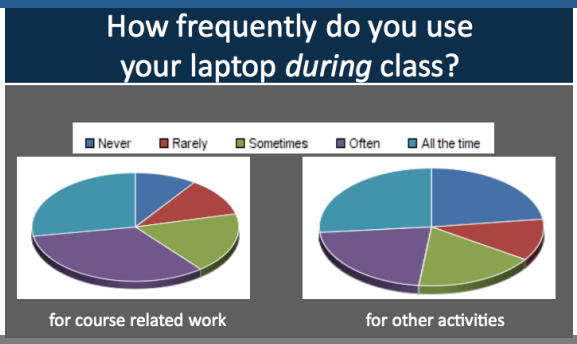
Informal CWRU survey (via Mike Kenney)



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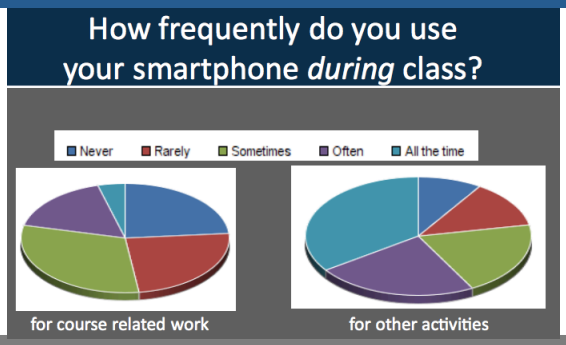

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What are students actually doing?

- texting (86 percent)
- checking the time (79 percent)
- e-mail (68 percent)
- social networking (66 percent)
- web surfing (38 percent)
- games (8 percent)

(McCoy 2013)

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How much time is being spent per day?

- Total time spent by students per day on the phone worked out to about 10 hours for women and almost 8 for men
- The most time consuming activity was texting (about 95 minutes), followed by emails (49) and Facebook (39)

Baylor University study (2014)
http://akademiai.com/content/b288753537587502/fulltext.pdf

Why are they using these devices?

- staying connected (70%)
- avoiding boredom (55%)
- doing related classwork (49%)
- entertainment (49%)
- in case of emergency (41%)

(McCoy 2013)

How much of a distraction is it?

Student view:

- No distraction 38%
- Little distraction 46%
- More than a little distraction 10%
- Big distraction 3%

Most of the distraction was visual (68%), followed by audio (37%)

(McCoy 2013)

Other people's use in class

Student view:

- No distraction 33%
- Little distraction 52%
- More than a little distraction 10%
- Big distraction 3%

(McCoy 2013)

Biggest disadvantages (student view)

- Don't pay attention (90%)
- Miss instruction (80%)
- Distract others (39%)
- Get called out by instructor (32%)
- Lose grade points (27%)

(McCoy 2013)

Why are they doing this?

- Believe that they are making more efficient use of time
- Believe myth that the current student generation are not only good at multitasking but somehow *need* it to get things done
- FOMO
- Random rewards can lead to compulsive, addictive behavior

Signs of addiction?

- For males "activities that positively affect cell-phone addiction include: time spent sending emails, reading books and the Bible as well as visiting Facebook, Twitter and Instagram."
- For females "activities that significantly affect cell-phone addiction… Pinterest, Instagram, iPod, Amazon and the number of calls made all exerted a positive effect on cell-phone addiction."
- "In addition, the number of calls made and the number of texts sent also positively affect cell-phone addiction."

(Baylor study)

Separation anxiety

"When iPhone users are unable to answer their ringing iPhones while solving simple word search puzzles, their heart rates and blood pressure levels increased, as did feelings of anxiety and unpleasantness. Also, performance (number of words found on word search puzzles) decreased as compared to when iPhone users completed similar word search puzzles while in possession of their iPhones."

(http://machineslikeus.com/news/iphone-separation-linked-physiological-anxiety-poor-cognitive-performance)

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Cognitive multitasking

Trying to simultaneously do some or all of`:

- Thinking
- Reading or surfing the web
- Writing, texting
- Speaking
- Watching TV or videos
- Listening to radio or music or other people
- Checking email or Facebook or messages

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General rule

- *Physical* multitasking is possible but cognitive is not
- In general, our brain can't do two cognitive tasks at once, except in very limited cases (such as music where a different part of the brain is involved)
- What we are actually doing when we think we are multitasking is *switching attention from one task to another*

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Multitasking and learning

To successfully *cognitively* multitask, you need to be able to:

- *Filter well*, i.e., quickly detect irrelevancy and distinguish between those things that are important and those that are not
- *Switch rapidly* from one task to the next
- *Efficiently sort and organize* the information in the brain so as to keep track of the results of the different tasks

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Costs of multitasking in learning

- There are costs involved when we switch from one task to another
- Multitaskers tend to use same mental and physical resources for all task, whether appropriate or not
- Time lost in switching increases with complexity of tasks
- When multitasking, people learn in the *surface* mode rather than the *deep* mode
- Writing notes in longhand aids retention more than typing and results in deeper learning

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What the research shows

- Multitaskers are worse at all three things than serial taskers
- Serial taskers actually take less time to complete a set of tasks than multitaskers
- Multitaskers crave distractions and the devices are enablers

Smartphone use can be risky

An OSU study "found that the number of pedestrian ER visits for injuries related to cell phones tripled between 2004 and 2010, even though the total number of pedestrian injuries dropped during that period. The study also found that adults under 30, mainly those between the ages of 16 and 25, are most at risk for cell-phone related injuries while walking.

…

What's more, the number of injuries caused by texting and walking may be higher than official figures indicate, since people are embarrassed to admit that they were injured while texting."

http://www.healthline.com/health-news/tech-texting-while-walking-causes-accidents-031014

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This is not purely a student issue

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Instructor options

- Faculty and student agree that ignoring the issue is the least effective strategy (Ladeji-Osias and Wells)
- *Politely but firmly* ask students to not use them in class and explain reasons why (Felder and Brent and Anne Curzan http://chronicle.com/blogs/linguafranca/2014/08/25/why-im-asking-you-not-to-use-laptops/)
- Discuss the issue with them and arrive at a policy (a one or two minute texting break mid-class has proved successful) (Siek)
- Use devices as part of the class teaching strategy (Smyser)

(*Prism*, October 2014 http://www.asee-prism.org/driven-to-distraction-oct/)

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Student views on polices

- 30% said there was no class policy about use
- Should teachers have a policy on use? Yes 54%, No 46%
- What should be the policy?
  - First offense warning, followed by penalties 65%
  - No warnings or penalty 31%
  - Penalty each time it happens 4%
- Should devices be banned? No 91%, Yes 9%

(McCoy 2013)

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What should instructor do for violations?

- Speak to student privately 72%
- Ask student to leave class 17%
- Confiscate or turn-off device 12%

(McCoy 2013)

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Sources

- David L. Strayer, Jason M. Watson, and Frank A. Drews, *Cognitive Distraction While Multitasking in the Automobile*. (In Brian Ross, editor: *The Psychology of Learning and Motivation*, Vol. 54, Burlington: Academic Press, 2011, pp. 29-58)
- Eyal Ophira, Clifford Nass, and Anthony D. Wagner, *Cognitive control in media multitaskers* PNAS, September 15, 2009, vol. 106, no. 37, 15583–15587
- *Frontline* interview with Clifford Nass http://www.pbs.org/wgbh/pages/frontline/digitalnation/interviews/nass.html
- http://www.apa.org/monitor/2009/02/multitaskers.aspx

More information on multitasking

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Prevalence of cell phone use and driving

- 85% of drivers report that they use a cell phone while concurrently operating a motor vehicle
- During daylight hours, ~10% of drivers are on cell phones

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Effects of cell phone use while driving

- Driver distraction joins alcohol and speeding as major causes of fatalities and injuries
- The majority of drivers suffer significant impairment when they use a cell phone
- 28% of all crashes were caused by the use of a cell phone to talk, dial, or text
- 2 out of 10 drivers who use a cell phone report that they have bumped into a person or object because they were distracted

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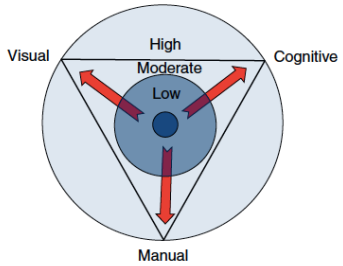
Types and levels of distraction



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Nature of distraction

- Low level demand on visual, manual and cognitive resources consists of things like listening to a preprogrammed radio station at normal volume
- High level demand may be using a touchscreen device to access information on the internet

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Cell phone use v. alcohol at legal limit

- Cell phone users were involved in more rear-end collisions than when they were intoxicated.
- Significantly more accidents when conversing on a cell phone than in the single-task baseline or alcohol conditions.
- Impairments associated with cell-phone drivers may be as great as those commonly observed with intoxicated drivers.

Conclusions

- Cell phone usage increases the crash risk by a factor of four
- There is no safety advantage for hands-free cell phones over hand-held ones
- Cell-phone driving does not improve with practice
- There is a slight safety *advantage* for having an adult passenger in the vehicle, even when engaged in conversation

Cause 1: Inattention blindness

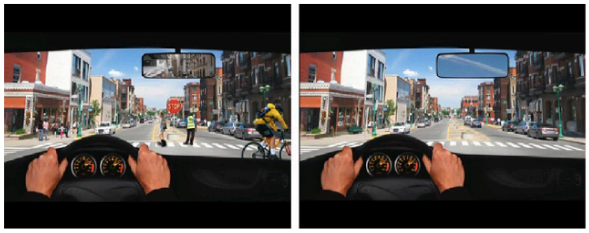

Figure 8 A representation of what a driver might perceive when they are not talking on the phone (left panel) and when they are talking on a hands-free cell phone (right panel).

Cause 2: Tunnel vision

Figure 10 An illustration of how visual scanning is disrupted when drivers are talking on a hands-free cell phone. The left panel represents the scanning pattern of an undistracted driver and the right panel represents the scanning pattern when the driver is talking on a hands-free cell phone.

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- Time lost in switching increases with complexity of tasks
- When multitasking, people learn in the *surface* mode rather than the *deep* mode.

Clifford Nass and colleagues found that:

- Heavy media multitaskers (HMM) were worse than light media multitaskers (LMM) in *all three areas*.
- "People who multitask all the time can't filter out irrelevancy. They can't manage a working memory. They're chronically distracted. They initiate much larger parts of their brain that are irrelevant to the task at hand. [*T*]*hey're even terrible at multitasking* ... So they're pretty much mental wrecks."
- People who say they're good at multitasking because they do it all the time are like smokers who say they've always smoked - so it can't be bad for them.

Some other results

- Multitaskers love irrelevancy. They get distracted constantly
- People who multitask all the time find it hard to switch it off *even when they don't need to*

Clifford Nass:

"One of the biggest delusions we hear from students is, "I do five things at once because I don't have time to do them one at a time." And that turns out to be false. That is to say, they would actually be quicker if they did one thing, then the next thing, then the next. It may not be as fun, but they'd be more efficient."

How can it be stopped?

What drives the desire to multitask?

- False belief in efficiency
- FOMO
- Random rewards can lead to compulsive behavior

More bad news

- 3% of people are ‘supertaskers’
- They perform as well, if not better, in the dual-task condition than in the single task condition
- fMRI studies show differences in their prefrontal cortex and anterior cingulate cortex
- This ability is narrow and not a sign of being ‘smarter’ across the board

Thanks!

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