

Don't use Laptops and Phones in Class

based on slides from
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Laptops and Phones

Lots of research shows that using laptops, tablets, and phones in class is bad for you and others.

- ✦ You don't learn as much.
- ✦ You don't remember as much.
- ✦ You take bad notes.
- ✦ You perform worse on tests.
- ✦ You distract others and they perform worse on tests.



Let's look at the research...

Phones in class are bad for you

...even if you are good at emotional regulation!

Participants were randomly assigned to one of four experimental conditions: cell phone usage allowed, cell phone possession allowed but without usage, cell phones removed, and a no-instruction control group. All participants watched a 20-minute lecture and were sent text messages to mimic classroom distractions. Afterward, participants took a multiple-choice test and filled out questionnaires assessing their level of obsessiveness, nomophobia, and mindfulness. **Participants who had their cell phone taken away performed best on the test with no other differences. None of the emotional-regulation measures moderated the results.**

Lee, S., Kim, M. W., McDonough, I. M., Mendoza, J. S., and Kim, M. S. (2017) The Effects of Cell Phone Use and Emotion-regulation Style on College Students' Learning. Appl. Cognit. Psychol., 31: 360–366. doi: 10.1002/acp.3323.

Computers in class are bad for test grades

...Average final exam scores among students assigned to classrooms that allowed computers were 18 percent of a standard deviation lower than exam scores of students in classrooms that prohibited computers. Through the use of two separate treatment arms, we uncover evidence that this negative effect occurs in classrooms where laptops and tablets are permitted without restriction and in classrooms where students are only permitted to use tablets that must remain flat on the desk surface.

Payne Carter, Susan, Kyle Greenberg, and Michael Walker, "The Impact of Computer Usage on Academic Performance: Evidence from a Randomized Trial at the United States Military Academy." School Effectiveness and Inequality Initiative Working Paper 2016.02 (2016)

Multitasking is Bad

We found that **participants who multitasked on a laptop during a lecture scored lower on a test compared to those who did not multitask, and participants who were in direct view of a multitasking peer scored lower on a test compared to those who were not.** The results demonstrate that multitasking on a laptop poses a significant distraction to both users and fellow students and can be detrimental to comprehension of lecture content.

Sana, Faria, Tina Weston, and Nicholas J. Cepeda. "Laptop multitasking hinders classroom learning for both users and nearby peers." Computers & Education, 62 (2013): 24-31

Laptops = Multitasking = Distracting

...students who used laptops in class spent considerable time multitasking and that the laptop use posed a significant distraction to both users and fellow students. Most importantly, **the level of laptop use was negatively related to several measures of student learning, including self-reported understanding of course material and overall course performance.**

Fried, Carrie B. "In-class laptop use and its effects on student learning." Computers & Education, 50 (3), 2008: 906-914.

Divided Attention Means Less Retention

Dividing attention between an electronic device and the classroom lecture did not reduce comprehension of the lecture, as measured by within-class quiz questions. Instead, **divided attention reduced long-term retention of the classroom lecture, which impaired subsequent unit exam and final exam performance.** Students self-reported whether they had used an electronic device in each class. Exam performance was significantly worse than the no-device control condition both for students who did and did not use electronic devices during that class.

Arnold L. Glass & Mengxue Kang (2018) Dividing attention in the classroom reduces exam performance, Educational Psychology, DOI: 10.1080/01443410.2018.1489046

Laptops = Multitasking = Distracting

Our results showed that **nonacademic Internet use** was common among students who brought laptops to class and **was inversely related to class performance**. This relationship was upheld after we accounted for motivation, interest, and intelligence. Class-related Internet use was not associated with a benefit to classroom performance.

*Ravizza, Susan M., Uitvlugt, Mitchell G., and Fenn, Kimberly M.
“Logged In and Zoned Out: How Laptop Internet Use Relates to
Classroom Learning” *Psychological Science*, 28 (2), 2016: 171-180*

Even class-related use isn't good

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Laptops Mean Too Much Multitasking

We find that students engage in substantial multitasking behavior with their laptops and have non course-related software open and active about 42% of the time. **There is a statistically significant inverse relationship between the ratio of distractive versus productive multitasking behavior during lectures and academic performance.** We also observe that students under state the frequency of email and instant messaging (IM) use in the classroom when self-reporting on their laptop usage.

Kraushaar, James M. and David C. Novak. "Examining the Affects of Student Multitasking With Laptops During the Lecture." Journal of Information Systems Education 21 (2), 2010: 241-251

Paper and Pencil is Better

Four digitally-based multi-tasking activities (texting using a cell-phone, emailing, MSN messaging and Facebook™) were compared to 3 control groups (paper-and-pencil note-taking, word-processing note-taking and a natural use of technology condition) over three consecutive lectures. Comparisons indicated that **participants in the Facebook™ and MSN conditions performed more poorly than those in the paper-and-pencil use control.... participants who did not use any technologies in the lectures outperformed students who used some form of technology. ...attempting to attend to lectures and engage digital technologies for off-task activities can have a detrimental impact on learning.**

Wood, Eileen, et. al. "Examining the impact of off-task multi-tasking with technology on real-time classroom learning." Computers & Education 58 (2012): 365-374.

It's about how you take notes

...even when laptops are used solely to take notes, they may still be impairing learning because their use results in shallower processing. In three studies, we found that **students who took notes on laptops performed worse on conceptual questions than students who took notes longhand.** We show that whereas taking more notes can be beneficial, laptop note takers' tendency to transcribe lectures verbatim rather than processing information and reframing it in their own words is detrimental to learning.

Mueller, Pam A. and Daniel M. Oppenheimer. "The Pen Is Mightier Than the Keyboard: Advantages of Longhand Over Laptop Note Taking." Psychological Science 25 (6), 2014: 1159-1168

Use laptops and remember less

Two groups of students heard the same exact lecture and tested immediately following the lecture. One group of students was allowed to use their laptops to engage in browsing, search, and/or social computing behaviors during the lecture. Students in the second condition were asked to keep their laptops closed for the duration of the lecture. **Students in the open laptop condition suffered decrements on traditional measures of memory for lecture content. A second experiment replicated the results of the first.**

Hembrooke, Helene and Geri Gay. "The Laptop and the Lecture: The Effects of Multitasking in Learning Environments." Journal of Computing in Higher Education 15 (1), 2003: 46-64.

Try it... you'll like it!

...many students make the decision to give up their laptop after experiencing attending a class without one, noting they would not have been willing to go through such an experience by their own decision. However, **once they experience not using a laptop in the law school classroom environment, they often change their method of taking notes and report improved learning and classroom experiences.**

McCreary, Jana R. "The Laptop-Free Zone." Valparaiso University Law Review 43 (2009): 1-87.

How you read might matter

We ***prefer*** to read on screens, but it might not be the best medium.

[Students have] a **clear preference for digital texts**, and students typically predicted better comprehension when reading digitally..... While there were no differences across mediums when students identified the main idea of the text, **students recalled key points linked to the main idea and other relevant information better when engaged with print.**

Singer, Lauren M. & Patricia A. Alexander, "Reading Across Mediums: Effects of Reading Digital and Print Texts on Comprehension and Calibration" The Journal of Experimental Education 85 (1) 2017

Taking Notes

How to take notes by hand

- ✦ From Dartmouth
- ✦ From Cal Poly
- ✦ From Utah State
- ✦ From a blogger

