

Notes: Laptops or Longhand?

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Teaching and Learning Services

It Depends...

You may have read that students learn more when they take notes by hand, compared to taking notes on a laptop. Or perhaps you've been frustrated by students appearing to be 'off-task' during your classes. Maybe you've thought about (or have implemented) a total technology ban for your classes. But what does the current research say about the effect of laptops on learning?

Evidence is very mixed! Some research suggests that students perform better on tests if they took notes by hand, but other research indicates that typed notes lead to better grades. Differences in methods between studies can account for some of these differences. For example, some studies have used TED Talks as the content to be learned while other studies have used live lectures, videos of lectures, audio-only recordings, or other stimuli. The dependent variables (outcome measures) also differ. Some studies use multiple choice tests, while others use written answers. Questions may be factual or more conceptual. Motivation levels of participants vary across studies. But these differences aren't the only problem with interpreting the results. Most of the effects are very small, and don't necessarily replicate across studies even when the same methods are used.

One result that seems to be consistent is that notes that are typed tend to have a higher word-count and have more word-for-word content than handwritten notes. Typed notes don't necessarily have more relevant content, however, and when course content includes a lot of images (graphs, diagrams, schematics) then typed notes may be very poor representations of what happened in class. The current literature doesn't provide much evidence about how note-taking effectiveness may differ across different types of classes. (If you're interested in a SoTL project, this might be a great topic!) Laptop use is associated with distraction, including for any student who can see the laptop. Whether that distraction affects grades is not clear. Some studies find an effect, but others do not.

The average does not predict the outcome for any specific individual. There are many reasons why some students benefit from using laptops, instead of writing notes by hand.



Further Reading

For more information about this topic, please see the following resources:

Morehead, K, Dunlosky, J. & Rawson, K. (2019). How much mightier is the pen than the keyboard for notetaking? A replication and extension of Mueller and Oppenheimer (2014). *Educational Psychology Review*, 31, 753-780. <https://doi.org/10.1007/s10648-019-09468-2>

Luo, L., Kiewra, K. A., Flanigan, A. E. & Peteranetz, M. S. (2018). Laptop versus longhand note taking: effects on lecture notes and achievement. *Instructional Science*, 46, 947-971. <https://doi.org/10.1007/s11251-018-9458-0>

Sana, F., Weston, T. & Cepeda, J. J. (2013). Laptop multitasking hinders classroom learning for both users and nearby peers. *Computers and Education*, 62, 24-31. <http://doi.org/10.1016/j.compedu.2012.10.003>



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One Size Does Not Fit All

Many teachers promote note-taking by hand or discourage technology use in their classes. Even though the current literature is a bit messy, and there aren't clear advantages in terms of retention of information, there are plenty of reasons why you might want students to put away their laptops. It's worth having a conversation with your students (perhaps during the first week of class, as they're getting to know your style) about WHY you recommend particular note-taking methods. Students don't necessarily know how to succeed in your class, so they could use your guidance.

Disciplinary factors: Some classes require more than just recording words. If your class content includes a lot of graphs, diagrams, or other visuo-spatial information, then typed notes just won't cut it. Students with touch-screen devices, who can write or draw with a stylus, might be just fine but in general you should recommend that students bring some paper to jot down those things that are difficult to type. If your class is a seminar, where students are expected to engage in discussion or problem-solving, then they are not expected to be taking notes. Encourage them to close the laptops for those activities.

Practice effortful note-taking: Note-taking is a skill, and most students don't learn how to do it well. In particular, they struggle with paraphrasing, or distilling large amounts of content into smaller chunks. You can help them by occasionally pausing your class and have students reflect on the notes they've just taken. If you have just covered a difficult concept, ask students to summarize it in one sentence. Take a statement that is full of jargon or specific terminology and have them write it in their own words. Try doing that instead of saying 'any questions?' at the end of a topic! It will help your students learn the difference between good notes and poor ones.

Accessibility and inclusion: Some students require accommodations in order to succeed in university, and that may include using a laptop. This type of accommodation may be for a physical disability, or for a cognitive one. If you ban laptops (or other uses of technology, including lecture recording) then the student who requires it will stand out to their classmates. A student may choose to avoid using a technology that is necessary for their success, to avoid embarrassment.

Averages are not individuals: Let's pretend that the research literature is more solid than it really is, and that there is good evidence that students who take notes by hand have higher average grades and better average comprehension than students who use laptops. Does that mean that handwritten notes are best for all students? No. Think of average income. There are plenty of people who make much more or much less than the average. For notetaking, there are students who take excellent notes on a laptop, and others who take terrible notes by hand. There are so many more factors associated with student success than notetaking method. Don't get too hung up on this one thing.

