
Pros And Cons Of Multitasking

Multitasking is the ability for an individual to deal with more than one task simultaneously. The idea of dealing with more than one task simultaneously is commonly argued and can be quite to the contrary. To summarize; multitasking is both beneficial and unbeneficial depending on the circumstances and what tasks you are dealing with. Jim Taylor, the author of "Technology: Myth of Multitasking?" in 2011, states that multitaskers are actually serial tasking (Taylor 2011). Rather than engaging in simultaneous tasks, you are in fact switching from one task to the other successfully. 'American Psychological Association's website describes multitasking to be neither efficient nor effective. Their findings demonstrate that when an individual shifts their focus to another task, that shift of focus is neither fast nor smooth. Studies by Gloria Mark show that when people are continuously distracted from one task they tend to work faster but produce less (Young 2010). Another found that students solving a maths puzzle took 40% longer when they were made to multitask (Young, 2010). Damon Young thinks when media and communication are involved, humans aren't hardwired to multitask. He says; "We're not really multitasking; we're switching between tasks in an unfocused or clumsy manner." (Young 2010)

Patricia Greenfield is a UCLA distinguished professor of psychology and director of the 'Children's Digital Media Centre' in Los Angeles. Greenfield has analyzed over 50 studies in the context of learning & technology and has also researched multitasking & the use of computers, the internet & video games. She says that "Learners have changed as a result to their exposure to technology." (UCLA 2009) Greenfield investigates the claim that an individual switches back and forth between two tasks rather than doing them simultaneously. She does this by conducting studies on students on the effect of technology on the student's ability to learn. One of the many studies she conducted was a classroom study – several students were given access to the internet and encouraged to use it during a lecture whilst the other students did not have any internet access. Both groups of students were then tested after the lectures and results showed that those who did not have internet access performed better than those who did.

From this study, we can infer that the students who had access to the internet and were switching their focus back and forth from the lecture were not able to retain all the information that was being said by the lecturer. "Wiring classrooms for internet access does not enhance learning" (UCLA 2009) says, Greenfield. Various studies show that multitasking "prevents people from getting a deeper understanding of information." (UCLA 2009) In summary, Greenfield's studies show us that using technology and/or having access to the internet during the process of studying/learning can be very ineffective and prevent full retention of information as well as decrease our skills in critical thinking, whereas studying/learning without access to the internet can allow an individual to retain much more information.

Research done by Boston College researchers, professors S. Adam Brasel and James Gips, in 2011 investigates "media multitasking". Media multitasking is the ability to use two types of media simultaneously or in conjunction with one another. Participants were placed in a room containing a television and a computer and were given half an hour to use either device. Results showed that the participants switched their eyes back and forth between the TV and computer at an average of 120 times in 27.5 minutes – or about once every 14 seconds. Brasel

and Gips used advanced cameras to track where participants were looking to “understand the physical demands and likely disruption caused by switching between the television and computer” (Boston College 2011).

During the study, the participants were not even aware of their own actions. On average, the participants thought they might have looked back and forth between the two devices about 15 times per half-hour – in reality, they were looking nearly 10 times more often. Surveys show that youths under 18 state that this type of media multitasking is the dominant way in which they use both devices. Brasel and Gips conclude that the computer drew the attention of the participants more than the television – drawing the attention at 68.4% of the time. The study also showed that neither device proved capable of holding the attention of the participants for very long. The average gaze lasted less than 2 seconds for the TV and less than 6 seconds for the computer. Results showed it wasn't only the youth that we're rapidly switching between the devices – male and female participants who were over the age of 40 switched gazes at an average of 100 times in 27.5 minutes. The study did not take into account the impact of another device that's now the staple of modern media; the mobile phone. To conclude, the study showed that it was nearly impossible for a participant to not look at either device for more than half a minute – demonstrating that media multitasking is very distracting and can cause an individual to easily lose focus on the task at hand.

UCLA psychologists investigated the effect multitasking had on memory recollection and learning new things. “Multitasking adversely affects how you learn” (UCLA 2006) says Russel Poldrack of UCLA. He states that even if you learn while multitasking, that learning is less flexible and more specialized (UCLA 2006), so you cannot retrieve the information as easily. Their studies show that depending on how you multitask and with what, you will use different brain systems. “The best thing you can do to improve your memory is to pay attention to the things you want to remember” (UCLA 2006) Poldrack added. He states that when certain distractions force you to pay less attention to your main task, you don't learn as well as you would've if you paid full attention. Tasks that require more attention will be affected by multitasking.

The researchers used fMRI scans to examine brain activity and function. Participants in the study, that were in their 20s, learned a simple classification task by trial-and-error. They were then asked to make predictions after receiving a set of cues concerning cards that displayed various shapes and divided the cards into two categories. With one set of cards, they learned without any distractions. With the other set of cards, they simultaneously listened to high and low-pitched beeps through headphones whilst keeping a mental count of the high-pitched beeps. The participants were then asked questions about the cards afterward and it was found that they did much better on the task they learned without any distractions. On the other hand, they could not extrapolate on the task with distractions. “Our results suggest that learning facts and concepts will be worse if you learn them while you're distracted” (UCLA 2006) said Poldrack. He also added that the results demonstrated a reduced capacity to recall memories when placed in a different context. Your brain processes different forms of memory through separate systems. For example, when you try to remember someone's name you are using a type of memory retrieval called declarative memory, and when you remember how to ride a bicycle you are using procedural memory. The hippocampus is necessary for declarative memory, so for the task that contained no distractions the hippocampus was involved. Whereas for procedural memory, the striatum is involved – which is the brain system that underlies our ability to learn new skills. In summary for UCLA's and Poldrack's research, multitasking affects

the brain's learning system, meaning, we do not learn as efficiently when distractions are present. This study also demonstrates that depending on what type of multitasking an individual partakes in while learning, the brain will use different systems.

Hypothesis: Having internet access during a lecture significantly decreases one's ability to focus and retain information as compared to not having internet access and solely focusing on the lecture alone.

Null Hypothesis: Having internet access during a lecture will not affect an individual in any way and will allow them to focus and retain information as much as an individual who does not have internet access during a lecture.

For my experiment, I will be replicating Greenfield's classroom study. The independent variable of this study is whether a participant has internet access during a lecture or not, whereas the dependant variable is how well a participant performs on a test related to the lecture. This study uses independent measures. This means that different participants are used in each condition of the independent variable (internet access) – meaning that each condition of the experiment includes a different group of participants. With independent measures, no order effects will be present – meaning the participants won't behave differently due to the order of the experiment's conditions because of factors such as boredom or fatigue which is the case with repeated measures. Independent measures are easier to handle and take less time. With this design, there is also increased external validity because more participants are used. The reason Greenfield's study uses independent measures is that the aim is to investigate purely the effect of having internet access whilst trying to listen to a lecture without any other conditions/measures present.