



Evidence Summary

College Students in an Experimental Study Took Longer to Achieve Comprehension when Instant Messaging while Reading

A Review of:

Bowman, L. L., Levine, L. E., Waite, B. M., & Gendron, M. (2010). Can students really multitask? An experimental study of instant messaging while reading. *Computers & Education*, 54, 927-931.

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Objective – To examine the effects of multitasking while doing school work. The experiment specifically measured total time spent reading a simulated textbook passage and tested comprehension in students who received instant messages before reading, while reading, or not at all.

Design – Experimental design in which one group of students read an online text while receiving and responding to instant messages. Comparison groups either received instant messages (IMs) prior to reading the text passage or did not receive any IMs during the task.

Setting – General psychology department at Central Connecticut State University, United States.

Subjects – Eighty-nine college students enrolled in general psychology courses. The participants included 43 women and 46 men and were between 17 and 46 years old. Most students were full time students (91%), most were European / White (74%) and in their first (46%) or second (33%) year of college. Participants' academic majors represented all the schools in the university.

Methods – Researchers created a simulated environment in which a passage from a psychology textbook was displayed on five consecutive screens. For the experimental group, an IM appeared on each of the five screens preceded by an alert sound. Messages were written to reflect the types of questions students might ask each other when they first

meet, such as “What do you like to do in your spare time?”

Subjects were randomized to three situations: receiving IMs before reading, receiving IMs during reading, or not receiving any IMs. Subjects were told that they would either receive IMs before reading, while reading, or not at all. Messages received during reading appeared one per screen after a specified time spent on each page (after 17, 15, 29, 20 and 26 seconds, respectively.) Students could take as long as necessary to read the passage and to respond to IMs.

After reading the passage, students were given a multiple choice test with 25 questions to determine reading comprehension and retention. Students also completed a demographic questionnaire to measure their typical instant messaging behaviour, including the amount of time they spend each week instant messaging, how often IM software is on when their computer is on, and how often IM software is on when they are studying. Both of these activities took place on the same computers used for the reading experiment.

Students were additionally asked to comment on the clarity of instructions, the representativeness of the task to their typical IM experiences, and the interest and similarity to normal coursework of the reading itself. These questions were asked on paper rather than on the computer.

Software recorded the lengths of time each student spent in reading the passage, reading and responding to IMs, and answering the online questions. For those students who received IMs during reading, the time spent from receipt of each IM to each response was subtracted from the total reading time.

Main Results – There were no differences in test performance between the three groups. Statistically significant differences were found in the amount of time that students took to complete the reading: students who instant messaged during reading took significantly longer to read the online text than those

students who instant messaged before reading and those who did not IM, even when time spent receiving and responding to IMs was subtracted from the totals. Students who instant messaged before reading took the least amount of time in the exercise. Further statistical analysis revealed no significant differences in the time spent instant messaging between the two IM groups.

Responses to the demographic questions indicate that students spend a mean 7.5 hours instant messaging per week, that 67% of students have IM software on “sometimes,” “often,” or “very often” while the computer is on and 62% of the time while studying. Analysis indicated that none of the IM use variables were correlated with test performance or reading time and that there were no significant differences between the experimental groups according to prior IM use.

Responses from the 77 students who answered the questions about the experiment itself are also included, though not all of these students answered each question. Seventy students (99%) agreed or strongly agreed that instructions were clear. Seventy-one percent of the 52 students that received IMs agreed or strongly agreed that they were realistic, and 75% agreed or strongly agreed that they responded to IMs in a typical manner. Sixty-two students (82%) agreed or strongly agreed that the text was similar to those assigned for actual coursework, and 39 students (51%) agreed or strongly agreed that the passage was interesting. Students commented on the authenticity of the experiment in free text responses such as, “I responded how I would have to anyone,” and “they were questions that anyone I don’t know might ask.”

Conclusion – This experimental study suggests that students who IM while reading will perform as well but take longer to complete the task than those who do not IM while reading or those students who IM before reading.

Commentary

The study was well designed and executed, but questions about how closely the experimental setting simulated the real world study environments and IMs of college students could impact the applicability of its findings.

Three possible theories are offered for the finding that the IM-during-reading group took the longest to complete the task: that the anticipation of receiving an IM was distracting, that there was a psychological refractory period that occurred when students switched between reading and instant messaging, and that students re-read passages after being interrupted by IMs. Researchers suggest that re-reading passages could have reinforced student understanding of the content and improved test performance for this group.

Researchers also offer explanations for why the IM-prior-to-reading group took the least amount of time to complete the task. They suggest that instant messaging before the reading could serve as a “warm up exercise” that facilitated comfort with the task and the equipment. Since each participant was told that IMs would arrive before reading, while reading, or not at all, those that got IMs at the beginning could also have concentrated on the reading with the knowledge that they would not be interrupted further.

There are a number of dissimilarities between the experimental setting and real life. Students in the experiment were given unlimited time to read and respond to IMs, while in reality, studying is often done in a time-limited context. The types of questions contained in the IMs and the frequency with which the IMs were sent were also not realistic. While students noted that the questions in the IMs were “questions that anyone I don’t know might ask,” it is notable that, due to the closed nature of most IM systems, people generally do not get IMs from people they do not know. It would be worth investigating if an extended IM conversation with a friend or romantic

partner would further impact reading time and comprehension. In the real world, students would likely not know that an IM is coming. The unpredictable timing and arrival of IMs similarly might further impact one’s ability to concentrate on academic reading.

Participant selection methods are not stated and it is not clear whether students enrolled in this study are representative of the overall student population or whether they knew they would be tested on the material. The study enrolled students in general psychology courses who were given course credit for their participation and it is possible that students sought to perform well on the test since their participation took place in an academic context.

It is unclear what the implications of these findings might be in instructional and workplace settings. If classes are time-limited, perhaps multi-tasking students would not be able to achieve comprehension within the time constraints of the class. Further distraction research in the classroom and workplace, not just in reading, is warranted.

It would be worthwhile to repeat this study in more natural environments with IMs that more closely approximate the types of conversations that students might have, in a time-limited context in which students are not being given academic credit for participation.