I read the entire article while giving my full attention.

There seems to be an issue in the classroom, especially on college campuses, regarding the method of instruction that persists as most common and well liked and which method actually leads to the most learning. It has been well studied and is now commonly known that an instruction style that is conducive to active learning leads to the most actual learning, while an instruction style that requires passive learning is not as affective. However, it seems that instructors still seem to stick with the traditional teaching methods that require only passive learning. The authors completed this study to come to an understanding as to why instructors and students still maintain and seem to prefer a passive learning environment. The authors also aimed to address this issue by finding ways to encourage active learning to both students and instructors. To find out why this was the case, they conducted a study to compare students’ self-reported perception of learning to their actual learning in a controlled environment. This controlled environment sought to make sure that the only variable between the two groups was the presence of active learning. To keep it controlled in this way and avoid bias, they considered many factors. Between the two groups they ensured consistency for the professors by instructing both professors on active learning techniques and best practices, making sure that both professors had extensive experience and fluency in delivering lectures, keeping the lecture slides, handouts, and other class materials the same between the two groups, and a few other controls. They also had to ensure consistency between the students. The authors made sure the students hadn’t had any previous exposure to the professors. They randomly assigned students into these two groups, ensuring that their level of familiarity with the topic, physics, was indistinguishable between the two groups. They also had each student experience both types of instruction in a crossover study design, so as to control possible variation between students. Finally, repeated the study in two different courses to make sure the results were consistent. They also kept the measurements of learning test blind for the instructor, and the author of these tests didn’t have access to the course materials or lecture slides. As we can see, this study was thoroughly thought out and designed in a way that didn’t allow for bias to slip in and nullify the results. The way that the authors measured the students’ perceptions of learning as well as actual learning was quite interesting as well. At the end of each class period, students took a survey that measured their feeling of learning (FOL), and a multiple-choice test of learning (TOL) that measured their actual learning. They also informed the students that these tests of learning wouldn’t influence their actual grade and that they would receive both types of instruction throughout the semester. The techniques used truly emphasize the impact of the study and the legitimacy of the results. Moving on to what the authors found as a result of the study we begin to see clear results indicating the disparity between students’ perception of learning and their actual learning. As mentioned before, the students were had to complete a brief survey that essentially measured their level of agreement on a five-point Likert scale. Across the questions of agreement, which probed at different aspects of perceived learning from the class, those that were in the active learning group consistently marked a lower score than those in the passive learning group on average. What is most interesting is that those in the passive group, although they felt they were learning more, demonstrably were not learning more than those in the active group according to the scores on the test of learning. These results were consistent across both classes that participated in the study. To prove the significance of the study, the authors also chose to confirm randomization between student groups by constructing statistical models and measuring significance.

One of the aspects of this study that sticks out to me about the strength of this study is the fact that they were super meticulous in making sure the study was well thought out and had a controlled design. The authors went to great lengths to ensure that the differences in student learning outcomes, as well as their perception of learning, could not be attributed to other factors like course material or instructor experience, as both aspects were identical between the two groups. The fact that the researchers used a crossover design further strengthened the validity of their findings. This attention to detail in their experimental design allowed for the elimination of bias, as well as the understanding that active learning truly has been singled out as the only variable between the groups, emphasizing that this aspect of instruction is truly what is making the difference in the actual learning of students. This seemed to be what many studies about this topic were lacking, so the fact that this study emphasized this makes it even more impactful to the field. Another aspect of the paper that I found interesting and to me seemed to particularly increase the validity of the results was their use of statistical models and significance testing for the confirmation of randomization. I’m not sure if I would have thought of this and followed it through all the way. I also particularly enjoyed the inclusion of student one on one interviews at the end to understand a little bit better their subjective experience. It brought a relatability to the study and made it feel more human. It was insightful to come to an understanding that the most likely reason for the preference for passive learning is the frustration that comes from an active learning environment. It helps us take this study, learn from it, and apply it into our own experience. The authors’ analysis of the results makes it clear that this issue exists but can be avoided if we allow ourselves to be informed about the way that humans learn best.

It is difficult for me to find significant things that this study could have done better, as they seem to have been very thorough in their experimental design and emphasized the significance of their findings, as well as how to apply it. One thing that I notice that could be an area of improvement could be a study into the long-term effects of active learning on students’ performance and retention. This study took place in a short period of time with measurements only within one class. From this study, we don’t know how this teaching style affects a student in the context of other classes across the span of several years. In addition, this study took place at Harvard University only, which is a school that notoriously only accepts students that are particularly interested and focused on their academic performance. I could see that this approach to active learning instruction may be super impactful in a positive way to students like this with high motivations to perform well academically, but maybe not so well with students that aren’t as motivated. Future research that might increase the validity and importance of active learning environments might increase the time frame and evaluate students’ attitudes toward active learning evolves over a longer period. This route of study might be particularly impactful if students are informed of the benefits of active learning throughout this time frame. Another route to go to expand research even further might be to try a similar study at perhaps a less prestigious university and/or a different type of class. The study was conducted only in STEM disciplines and at Harvard University. If the study was able to extend their results to other disciplines and at universities with a more diverse portfolio, it might provide a broader understanding of how active learning impacts a wider variety of learners. This would increase the generalizability of the results to different academic settings.

This was my own work.