

Having an online social forum for class networking gives physics students a boost

October 2 2018

cn Indiana University

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Physics 15200 Fall 2018

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Sep 17, 2018 at 10:09pm

Shown 31 times

STUDENT

Hey Everyone! Don't forget to try and rework some problems for the upcoming test! I find a good way to retest problems is to multiply one factor by two or likewise to have an easily confirm-able unique question. [#TestPreparation](#) [#Test2](#) [#Dontlosehope](#)

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Physics 15200 Fall 2018

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Sep 17, 2018 at 7:45pm

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STUDENT

Could anyone help with the second question on the sixth homework problem? I can't seem to calculate the correct answer but I am using the gravity of Earth times the mass found in part 1. [#Homework](#)

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Sep 17, 2018 at 9:50pm

that should be correct as long as you are using the right mass double check

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Physics 15200 Fall 2018

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Sep 17, 2018 at 7:39pm

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STUDENT

There is a warm up and a homework due tomorrow night. I think homework helps knowing where you stand and what should you prepare for the test! [#Homework](#) [#TestPreparation](#)

☆☆☆ 3 Ratings

💬 4 Reflections

A screenshot of the online physics forum. Credit: School of Science at IUPUI

Grasping the impulse-momentum theorem during a 100-level physics lecture is one thing, but what if it doesn't make as much sense once you start your homework assignment?

Andy Gavrin, IUPUI [physics](#) department chair and associate professor, first added an online social [forum](#) to his courses to help students stay engaged in the coursework and assist one another outside of [class](#). A new study of these forums indicates the online tool is valuable to helping students succeed in physics courses.

"Networks identify productive forum discussions" is published online this month in the journal *Physical Review Physics Education Research*, a publication of the American Physical Society.

Gavrin is studying the forums in collaboration with Adrienne Traxler of Wright State University and Rebecca Lindell of Tiliadal STEM Education Solutions. They found that when the online forum showed denser collaboration networks, the students who were most central in the [network](#) were more likely to achieve a higher final course grade.

"This project is about how students interact with one another," Gavrin said. "Learning is very much a social activity, and you see that with students getting together to study and in classroom discussions. The more opportunities students have to interact with one another to talk about the subject, the more successful they are likely to be in learning."

Researchers analyzed data from three consecutive fall semester courses Gavrin taught of Physics 152, a calculus-based physics and engineering course. Gavrin used CourseNetworking, an online forum developed at IUPUI, that allows students to discuss course materials, connect with each other and offer mutual support. Participation in the forum, which

has similar features and setup as other social networks, was not graded, but students could earn extra credit. Each semester, 160 to 180 students were enrolled in the class, producing thousands of forum comments, responses to comments, polls and response ratings.

The students' interactions were transformed to an anonymous data set that was analyzed two ways: PageRank, the tool developed by Google to determine what data is most central, and target entropy, which measures the variety in the links among individuals. If a person interacts with a lot of other people in a social network, it indicates they are likely central. If the people they interact with are central themselves, that reflects back on the first person.

"What we are finding is a clear correlation between students' centrality in the network and their success in class," Gavrin said. "That really shows there is some connection between being involved in the network and doing well."

While researchers aren't ready to say involvement in the social network causes improved grades, the understanding of how the two are linked will feed into future projects aimed at understanding what students are saying and how their use of the forum makes them central. Additionally, the research indicates that instructor facilitation in the forums matters.

In two of the three semesters, Gavrin used the [online forum](#) as the primary tool to distribute handouts, lab worksheets and other class materials. He also engaged students with a weekly "professor comment" area where he would share interesting physics news and what was coming up in class. In the semester when Gavrin used the forum only sporadically to remind the class about upcoming exams, the forum was less dense. It also lost the connection between central students—those most involved in the network—and higher course grades.

While it may seem the central students are simply the high-achieving students and that the forum would not improve their success, the lack of correlation between centrality and higher grades in the semester with less involvement from Gavrin suggests that argument is incomplete.

In future projects, Gavrin hopes to gain an even better understanding of how students work together and what physics educators can do to enrich that process.

"We want to understand the educational setting in a way that will allow us to improve it, so we can develop new tools that will help students be more successful in class, understand physics and other coursework better, and ultimately be more successful in college," Gavrin added.

More information: Adrienne Traxler et al, Networks identify productive forum discussions, *Physical Review Physics Education Research* (2018). [DOI: 10.1103/PhysRevPhysEducRes.14.020107](https://doi.org/10.1103/PhysRevPhysEducRes.14.020107)

Provided by Indiana University-Purdue University Indianapolis School of Science

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