

Class size matters, but how big is too big?

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Class size is a worry in education. In our dreams of an ideal world, we teachers might all want to have, say, just twelve students in a class - small enough for every student to get individual attention but big enough for students to interact with each other. In reality, practical constraints and costs mean that classes of 40, 60 or even 100 students are the norm in most situations. Larger class sizes have detrimental effects on student learning, but how big does a class have to be before these effects become noticeable and student learning is diminished?

Surprisingly, despite the obvious importance of this question, there has been no previous research looking at the adverse impacts of class size on learning in foreign language classrooms, such as English language classes at Thai universities. Most previous research has investigated teachers' beliefs about class sizes, and this research has identified certain problems with larger classes that could diminish student learning. Larger classes often have discipline problems, teachers find it difficult to develop rapport with students, students have fewer opportunities to speak, they receive less attention from teachers, and feedback on student work is reduced. All of these problems could adversely affect student learning, but it's unclear how many students there need to be in a class for the effects of these problems to become noticeable.

To find this out, we can collect the grades of every student who attended the four fundamental English courses for engineering and science students at KMUTT over four years. This gives 984 classes, the size of which varies from 10 to 103 students with an average of 36. While grades don't truly represent learning, they provide us with a practicable measure that applies across large numbers of students.

To see whether class size had an effect, we can look at the relationship between the size of the class in which a student studied and the grade received. For the 30,000-odd student grades, there was a negative correlation between grade and class size ($r = -0.126$; $p < 0.001$), meaning that generally the larger the class, the worse the grade. To check that the grade differences really were due to class size (rather than, say, student major), we can look at the grades of those students who studied in very differently sized classes. For instance, one student got a B+ for one course in a class of 31 students; for the next course his class had 83 students and he got a C; then he took another course with 75 students and got a C+. There were 289 students who studied in classes of very different sizes for different courses, and the negative relationship between class size and learning was even more noticeable for these students ($r = -0.222$; $p < 0.001$), confirming that class size has a negative impact on grades.

This negative relationship between class size and grades is something we expected, but are there any threshold levels of class size beyond which learning noticeably diminishes? To find out, we can look at the average grade of students for different class sizes. Where there are sudden drops in grades as class size increases, we can identify threshold levels beyond which students learn less. In classes of 16-20 students, the average grade as a number was 2.89; for classes of 21-25 students, 2.88; and for classes of 26-30 students 2.73. Here, the increase from 16-20 to 21-25 students per class had almost no effect on the grade, but the next increase to 26-30 saw a noticeable drop. For 31-35 and 36-40, the average grades

were 2.77 and 2.71, suggesting that there is a plateau of class size similar to 26-30. When class sizes go over 46, however, the average grade plummets to 2.13. We can therefore identify two important threshold levels. Up to 25 students, grades don't seem to be much affected by class size; above 25 students, grades are noticeably lower. There is a fair amount of stability in grades for classes of 26-45 students, and above that grades drop massively.

These results have important implications for university administrators, and might also be applicable at other educational levels. Ideally, English language classes at universities should be kept to a maximum of 25 students. For practical reasons, this ideal might not always be attainable. In contexts where this ideal is impractical, whatever happens, no classes larger than 45 students should be arranged. For the benefits of student learning, a regulation setting the maximum possible class size for English language courses at 45 students needs to be issued.

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