

How high can you go? There should be a limit for campus buildings

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There has recently been a lot of interest in high-rise campuses, particularly with the completion of the Parramatta CBD campus for Western Sydney University, the RMIT Swanston Academic Building in Melbourne and the University of Newcastle's NewSpace building.

Several developers are pushing high-rise buildings as a solution to the needs of a higher education sector still experiencing student growth and having a large portfolio of legacy buildings.

Some of these developers have expressed a desire to develop high-rise university buildings as an "asset class" similar to commercial offices, retail buildings or industrial buildings, particularly as they say this gives them alternative uses for buildings primarily designed to provide office space.

These propositions certainly are worth examining.

There are about one million university buildings in the world but only about 60 of them are more than 12 storeys high. The principal reason for this is that the most common undergraduate teaching pattern involves classes finishing five minutes before the top of the hour, and the next class starting five minutes after the hour. In most cases, this results in disabling lift congestion in teaching buildings taller than three or four storeys.

A good example of this was the 23-storey University of Technology Sydney Building 1 which, -

despite eight very large capacity lifts, experienced waiting times of more than 15 minutes at peak. UTS finally solved this problem by removing most teaching from the building above level four and using the upper levels for research or administration.

A taller academic building, such as the RMIT Swanston Academic Building, can be made to work for teaching, but only by the provision of high-capacity escalator systems to supplement lifts and stairs on teaching floors. At the SAB, eight 26-person lifts are supplemented by escalators from levels two to level seven, plus a dedicated stairway for circulation. As a result, about 30 per cent of the building's floor plate is lost to lifts, stairs, escalators and associated circulation, which substantially increases the cost of each yielded square metre.

At WSU Parramatta, which is a much smaller facility, a similar effect can be observed. Seven large-capacity lifts and escalators from levels one to four provide the vertical circulation. The impact on the floor plate is similar to that at the SAB.

In the US, City University of New York's Baruch College is located in a high-rise building but, despite six enormous double-ended lifts (the six pack) and escalators, the building is still jammed at the top of the hour.

The new Cooper Union building in New York has a staircase that is about 15 per cent of the lower floor plates of the building. Opinion is divided as to whether this works but, again, the teaching floors of the building are dominated by vertical circulation.

Another issue that needs to be considered with buildings using escalators is the noise they create. Providing learning space for students in close proximity to escalators may work where the background noise level is high because of the people load but, especially as the escalators age, the noise can be intrusive.

If top-of-the-hour programming could be abandoned, with the start and finish of classes staggered, then the problem with peak demand could be overcome in theory.

Contemporary digital timetabling systems should make this possible, but as far as I am aware no Australian university has chosen to do this and there are numerous reasons this may be problematic, including reducing the efficiency of the teaching suite and creating awkward breaks in teaching schedules. Block teaching, as in a K-12 school, where the academic moves

between classes and the students mostly stay put, is another option and one that may work.

Nevertheless, for most universities, using a high-rise building for teaching purposes will remain problematic because of lift congestion or because the plan will lose a high proportion of floor plate to lifts, escalators and dedicated stairs, increasing the cost per yielded cost per square metre. The cost of operating and maintaining lots of lifts and, particularly, escalators, which have a lot of moving parts, also is quite high.

While the SAB was purpose-designed as an academic building and provides a suite of teaching options, including stepped auditoriums, the WSU project has been adapted from an office building, which means floor-to-floor dimensions are inadequate to provide any stepped teaching facilities. WSU has overcome this by focusing on small-group teaching but, even so, multiple screens are required to relay information to students and sight lines to the teaching staff are poor. Some may see the proportions of the teaching spaces as being less than ideal, with the ceiling height too low for the size of the room. And, while this type of technology-enabled active learning lab arrangement is good for some teaching styles, it is not good for all.

Despite the continuing interest in small-group and active teaching for many perfectly valid pedagogic reasons, much teaching in Australian universities still is carried out in large groups, for economic reasons or because this is an effective way of putting an inspiring academic in front of as many students as possible.

For whatever reason, the vast majority of Australian undergraduate teaching is still lecture-based, and larger venues are in high demand at all universities.

Larger venues that provide opportunities for student interaction, such as the 200-seat “collaborative classroom” (actually a stepped auditorium) at the UTS faculty of engineering and information technology building, or the double-row, single-step, Harvard-style theatres at the Tasmanian school of business and economics building (at the University of Tasmania) offer the capacity for an academic to lecture or for students to work together collaboratively. But this type of facility cannot be achieved in a typical office building without serious compromise, or by cutting a hole in the floor.

It would be great if it really were possible to adapt CBD office buildings successfully to provide academic accommodation as this would give universities the opportunity to provide teaching space in locations well served by public transport, but there are other problems aside from lift

congestion and floor-to-floor heights.

The first and most obvious is cost. Typical rents in CBD locations are high and include a component for land cost and the cost of building in the CBD.

Australian universities are used to developing buildings on land they own, in many cases land they have been given by the state. They generally pay no rates and have complete control over how they maintain and operate their buildings. The effective cost of developing a campus, even a rather special one, on owned land is still much lower than renting space in CBD buildings. The functional problems of adapting office buildings to academic purposes are not - insuperable but they will limit teaching options and they are expensive.

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