

Commentary

Economies of scale in medical education? Or diseconomies of scale?

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Medical education is expensive (1). If it could be delivered at a lower cost, then substantial savings could be made and/or substantially more learners could be educated (2). One way of saving funds or increasing productivity in any walk of life is to generate economies of scale. Economies of scale are the advantages that organizations achieve by increasing the scale of their operations (3). The term is most often used to describe efficient and large-scale practices in manufacturing. In the past 5 years there has been growing interest in cost and value in medical and surgical education and specifically in how to create more value for a given cost (4). Could one way to increase value be to drive economies of scale? The short answer is that in certain areas of activity medical and surgical education providers may be able to drive economies of scale. But there are many other areas where economies of scale may not be possible or where an attempt to create an economy of scale might adversely affect quality or where diseconomies of scale might inadvertently be created (5).

But first let us start by looking at how economies of scale might help. Certainly, economies of scale might help medical schools by increasing their purchasing power. A single large medical school or a consortium of medical schools may be able to bulk-buy at lower prices. Examples of such purchases might be books, journals, e-learning resources or surgical simulation equipment. In this way a large institution or consortium might be able to purchase

at a lower cost per head than a single small institution. Another way of driving economy of scale is to ensure that the content purchased is actually used by all relevant learners within that institution. It is surprising how often that content purchased is not used to its full capacity.

Unfortunately, this is where economies of scale in medical education are likely to start and end. It is a seductive idea that we can increase the outcomes of medical or surgical education significantly and at the same time save costs by means of economies of scale. However, it is an idea that simply does not work in practice.

For a start, medical doctors are not items that can be manufactured. Learners are individuals with unique learning needs and ways of learning and they need to make their own way along their own learning journey (6). The idea that large numbers of them can be herded through training programmes just does not fit with modern educational thinking.

Can medical students be educated in bulk? If a lecturer gives a talk to 100 students and then gives the same talk to 200 students, is not the second talk twice as efficient as the first? It would be, but only if it were effective in the first place. But if the learning outcomes from lectures are negligible, then doubling a negligible amount will not help a great deal. Modern medical education increasingly relies on problem-based learning or simulations (7). For these to work, small groups are required, and

so medical education in these formats simply cannot be delivered in bulk.

Interprofessional education has grown in recently years in both size and impact and is often suggested as a potentially lower cost method of medical education. However, grouping different professionals together for the purposes of their education and with the aim of saving money is unlikely to work. Good interprofessional education requires adequate planning and it needs to be curriculum-driven and programmatic; not least it often needs to be in small groups. (8) None of this is to say that lectures or interprofessional education or any other form of medical education are ineffective or inefficient, but that using them merely to drive economies of scale is unlikely to work.

In fact, attempting to drive economies of scale in medical education may have the opposite effect. Diseconomies of scale happen when large organizations find that their size makes them less rather than more efficient. The causes of diseconomies of scale are multifold, but a few themes emerge that are likely to be recognizable as forces within medical education.

One such force is duplication of effort. If a medical school is small and has a small faculty, there is unlikely to be duplication of effort. All the faculty members are likely to know each other and what they do, and so are unlikely to duplicate effort. However, the opposite is true of large institutions. Very large institutions might have more than one online learning website, for example, or

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might have more than a single simulation centre. Some may even have more than one faculty development programme. Some of this apparent duplication may even be necessary and appropriate—for example, different online learning websites that are in different formats may be necessary—but this will hardly be conducive to saving money.

Another force that can drive diseconomies of scale in medical education is competition with oneself. Providers can become so big that they create a range of different resources which then start to compete with each other. So a university might produce online continuing professional development in diabetes care, a diploma in diabetes care, face-to-face education about diabetes and medical education assessment tools for diabetes care, all of which start to compete with each other for users' attention.

Another problem with large institutions is that they cannot always respond

as quickly and efficiently as they should. A large medical school that wants to create a more efficient curriculum will not be able to do this quickly. It will need to get all departments to sign up to the new curriculum, to change the delivery formats so that they fit with the new curriculum, to change to assessment so that it is aligned with the curriculum and finally to change the evaluation strategy so that it also fits with the new curriculum (9). These will all take time and resources, which themselves will drive diseconomies of scale.

Large medical education institutions also have larger costs related to communication. For example, a very small medical school might need only a few channels of communication, whereas a large medical school might need an exponentially larger number of channels linking departments and units horizontally and vertically (and with channels increasingly intersecting with each other). The costs of running these

communication channels (which are essential in all institutions) will grow as the institution grows.

Finally, larger institutions need larger numbers of managers. For example, a medical training body with just 3 employees might not need a single manager. However, a training body with 200 employees would require a number of management layers. The managers are a necessary cost, but a cost nonetheless, and can this undoubtedly contribute to diseconomies of scale. Larger organizations will need to attract higher profile managers who in turn attract higher salaries and thus further drive up costs.

Value is achievable in medical education. Occasionally, economies of scale will help to drive value. But more often than not, attempts to scale up medical education do not contribute to economies of scale and in fact the reverse may occur. A medical school is not a factory.

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