Is the Sun Setting on Lecture-based Education?

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Lecture-based instructional models have been the mainstay of education for centuries. They excel primarily at delivering information from the one to the many. Educators refer to this model as "the sage on the stage". Clearly there are educators who relish this role and are strongly opposed to moving away from it. Yet, educational research and new innovative technologies are suggesting that lecture-based classes may no longer be the most effective teaching method for many situations, especially clinical practice.

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INTRODUCTION

Lecture-based instructional models have been the mainstay of education for centuries. They excel primarily at delivering information from the one to the many. Educators refer to this model as the "sage on the stage". Clearly there are educators who relish this role and are strongly opposed to moving away from it. Yet, educational research and new innovative technologies are suggesting that lecture-based classes may no longer be the most effective teaching method for many situations, especially clinical practice[1].

DISCUSSION

In a lecture, there is an inherent assumption that the presenter is giving valuable information which automatically transmits to functional knowledge in the student simply by the fact that he or she presented it. Unfortunately, too many times the lecture can devolve into an ineffective information dump. The instructor blasts through a series of bullet point slides, leaving it to the learners to figure out how to piece the content together and assimilate it into something meaningful.

The lecture has been our dominant model of teaching for so long because early theories suggested learning was primarily the acquisition of a quantity of knowledge. Learning activities and classroom skills were all directed at the acquisition of content knowledge or specific skills. This approach assumes that simply giving information is sufficient for the individual to have learned. However, there is little emphasis on assuring translation of the knowledge acquired to what is really needed in the real world.

We reinforce this idea by our common testing methods which emphasize whether or not an individual has memorized the information given. This does not actually evaluate whether or not the individual can apply the information in a real-life scenario. The emphasis throughout our educational system on standardized testing and benchmarks established by those standardized tests has taken us off track from producing ideal educational approaches.

Our classrooms are filled with teachers who unfortunately are just not inspiring as a lecturer. Even for those who are dramatically engaging there are fundamental forces at work making the lecture delivery model less effective. The uninterrupted attention span for adult learners is estimated to be around 20 minutes. That is much shorter than the average lecture class. If that is the case, how much are people really getting by sitting in a lecture class that may extend for well over an hour or more? Even for a great lecturer, the deck is now stacked against them because of the multitasking world we live in and the decreasing attention span that most students seem to have.

Another serious challenge to the effectiveness of lecture relates to information processing. We only have two channels for processing information (visual and auditory). If there is too much information coming in on one or both channels simultaneously, the student experiences cognitive overload and that dramatically reduces the capability to assimilate information presented[2].

One of the main problems with the lecture format is that the information presentation goes by so fast. Students may be actively trying to take notes on the lecture and because they are processing what they are writing with visual and auditory channels (the auditory channel is used by "hearing" our thoughts as we write), there is limited cognitive capacity to pay attention to what the lecturer is saying while taking notes. Students may often ask a question that was answered in something the instructor just got

through saying. It's not that they weren't listening. It's that they were not able to process what was said because they were busy taking notes about a previous concept.

In the massage and manual therapy fields, lecture-based courses exist in both entry-level education and continuing education programs. A particular challenge for lecture-based content delivery is relevance. Students often complain that lectures are boring or don't seem relevant to what they really need to know. This lack of relevance may be present in both entry-level and continuing education programs. In discussing continuing education in the medical field, Harden notes that "relevance is as much about the perception of the user or learner as it is about the details of the content itself[3].

One reason that students often find lecture content lacking in relevance is that the information delivery model is not reflective of situations they will likely encounter in real life once leaving school. Other educational strategies are much more effective at introducing situated learning—that which mimics real life situations. Improved learning outcomes and improved critical thinking skills are associated with educational activities that more accurately reflect how information will be used in real-life situations[4].

Lecture formats are often used simply because this is the model that instructors learned when they were in training. It is not easy to change from what was modeled for us in our own training. Even when there is research evidence to the contrary, teachers may stick with what is familiar. Stephens noted that "despite evidence suggesting that other learning modalities are more effective, large-group continuing medical education (CME) activities continue to be predominantly lecture-based[5].

If lecture-based formats are not ideal, what are the alternatives? New and exciting educational innovations exist that can move us beyond the lecture format. Up until the recent technological boom of the last 20 years, educational delivery models did not change much from those of the last 200 years. However, this recent disruptive technological period has ushered in a dramatic era of new possibilities that encourage re-evaluation of the most effective instructional strategies. Not all of these strategies require technological interventions, but they do represent a significant departure from formal lecture-based teaching methods.

One of the most significant departures from lecture-based teaching formats is problem-based learning, and this model has become a central core of the curriculum in numerous medical schools over the last several decades[6]. In this teaching approach, students are given problems to work out before large amounts of content about the subject matter have been given to them. It is through this process of working out problems that they access and interact with the relevant content. That content becomes highly realistic by making it an integral part of the problems students are working on. As a result, there is a greater likelihood of anchoring it in long-term memory.

New software developments that take advantage of Internet technology show tremendous promise for teaching through innovative case study methods. In medical education, the use of virtual patient simulations is gaining increasing attention as an outstanding way to teach clinical reasoning, and realistic practice[7]. In virtual patient simulations, each student may go through a different process as they learn about clinical content related to a virtual patient which has been programmed to respond with clinically relevant information.

This process of individualized learning in a situation that reflects the way patients may present in a real clinical environment is particularly well-suited for teaching clinical reasoning skills[8]. Initial studies that have looked at comparative effectiveness of virtual patient simulations compared to traditional learning formats are encouraging and show significant benefit for this learning strategy[9,10].

There is still a long way to go in training teachers how to effectively implement their curriculum content through these unique virtual patient scenarios. This model also has great implications for subject matter in massage and manual therapy education, but significant teacher training in effective clinical case construction is mandatory.

Educators should not fear that classroom methods have to be either completely lecture or completely nonlecture formats. There are many effective combinations that may include some of both. Instructors and institutions are finding improved student outcomes with hybrid courses that are a combination of online learning and classroom-based instruction. Much attention has recently been focused on the benefits of the Khan Academy (www.khanacademy.org/). Instructors use Khan Academy video presentations on YouTube for lecture content, freeing the instructor so as to be able to spend more time individually with students in the classroom.

Another momentous factor in the educational landscape that cannot be ignored is the influence of social media on teaching and learning. Formerly, education was something that occurred within the walls and confines of the classroom building. Now with the ubiquitous nature of learning resources readily available on numerous devices at our fingertips, it is clear that learning can happen anywhere and anytime. This is actually a tremendous advantage, because learning small chunks of information right when they can be immediately used is a much more effective way of making that learning stick. In a lecture format there may be a large amount of information delivered over the entire period of the lecture, but it may be quite some time before the student encounters a situation where the information can be put to use.

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CONCLUSION

It is completely natural for educators to feel uneasy and uncomfortable with the way change disrupts their current teaching process. However, while lecture-based teaching has served student needs well for a very long time, we are currently experiencing the most significant revolution in education in over 200 years. It is not only technology that has caused this disruptive change, but also improved understanding of learning theory, especially adult learning strategies[1,11-13].

Clearly there are new methods of teaching that will surpass lecture formats in their effectiveness for certain subjects. There will always be a place for interesting lectures, but their role as the central form of classroom instruction will dissipate in the years to come. It is an exciting time to see what new educational strategies develop and how their implementation will greatly improve tomorrow's clinicians.

CONFLICT OF INTEREST NOTIFICATION

The author declares that there are no competing interests.

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