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Todd Dorman
Senior Associate Dean for Education Coordination
Associate Dean for Continuing Medical Education
Professor and Vice Chair for Critical Care
Department of Anesthesiology & Critical Care Medicine
Johns Hopkins University School of Medicine
Baltimore, Maryland, USA

ICU Management & Practice Editorial Board Member

tdorman@jhmi.edu

@tdorman12

Adult education for ICU management

A better way

Frequently, formal education sessions crafted for medical professionals fall short in their ability to advance the competency of providers. There is a better way! It involves utilising knowledge from the adult education world and applying it to our critical care domain. A move to active teaching and learning strategies improves outcomes from the education. Sequential exposure to information is also useful. Improvement in the learner's ability is best achieved when both the planner and the learner follow adult education principles.

Frequently, formal education sessions crafted for medical professionals fall short in their ability to advance the competency of providers. The less than ideal effectiveness is secondary to a number of causes, including too great a reliance on past approaches and a general lack of understanding of some basic tenets of adult education. These deficiencies in our knowledge on how to best educate stem from a historic approach that has deep roots in the apprenticeship model. In such a model the content expert is perceived to be the best educator. Furthermore the historic approach is based significantly on passive education approaches, such as presentations. Some have called the linking of these two historic approaches the 'sage on the stage' model.

Unfortunately, people learn in different ways and a singular approach to education serves as an inherent barrier to success. Importantly, the content expert may indeed hold the richest dataset related to the disease, disorder, syndrome, etc., but may not possess the ability to impart such knowledge to others in a manner that facilitates their use and implementation of the knowledge. This is not because the content is deficient; in fact the material will typically be robust and 100% accurate. The problem is that too much material is presented in too short a period of time. Key take-home messages are not highlighted or transmitted in a manner in which the audience will learn from them. Essentially such approaches amount to awareness phenomena where the audience leaves aware of facts, but is not prepared to use these facts and improve their practice.

There is a better way! It involves using knowledge from the adult education world and applying it to our critical care domain. It involves transitioning from passive forms of education to more active formats. Active learning is achieved through active teaching methods. The 'sage' becomes a facilitator and a coach.

Four adult education principles

There are numerous adult education principles that come into play. In this manuscript I will focus on four of them, as I believe these to be critical:

1. Dale's cone of learning
2. Ebbinghaus' forgetting curves
3. Dreyfus' ladder of skills acquisition
4. Knowles' andragogy.

Dale's cone of learning

Most of us have heard some of the basic tenets espoused in Edgar Dale's cone of learning but may not have known the attribution. Dale taught us that we remember/learn more in a quasi-hierarchical manner starting with the least amount of retention when we only read, proceeding to the highest levels of retention when we can discuss and do actions. Although what is below is not exactly what Dale said, it is the most common interpretation of his comments. We remember/learn:

- 10% of what we read
- 20% of what we hear
- 30% of what we see
- 50% of what we hear and see
- 70% of what we say and
- 90% of what we say and do.

This is at the root of why passive forms of learning, those close to the top of the list, are simply less impactful, even though they may be the most common approach used in lectures, grand rounds and medical meetings. The list also helps us to understand why active forms that include saying and doing increase the likelihood of being remembered. These are the principles that lead us to understand why read back can be effective, why workshops are effective and why simulation is so important. Such approaches also allow for those who are auditory learners and visual learners to be better served.

Ebbinghaus' forgetting curves

Herman Ebbinghaus reminded us that if we can learn, we can also forget. His studies taught us that it takes multiple exposures to the material for it to become more permanently engrained. The graph shows how with each subsequent exposure our knowledge decay is lessened and thus our memory is more permanent. Thus the present approach of a single lecture on a topic is a misfire on both Dale's and Ebbinghaus' principles. If we want the new knowledge to lead to improvements (actions) then we should plan for repeated exposures spaced apart over time and utilise active teaching methodologies.

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Dreyfus' ladder of skills acquisition

The Dreyfus brothers (Stuart and Hubert) taught us that if we are educated correctly we can progress from novice to expert after transition through being competent and proficient. In medicine, we have interpreted this to mean that when we finished our training we were deemed experts. This turns out to not be true. In fact, we are more likely proficient at that stage. Developing into an expert takes time, volume of case exposures, dedicated personal development (ongoing learning) and episodes of effective self-reflection. As most clinicians had no exposure to training as an educator, they were not aware of Dreyfus' and Ebbinghaus' work. Thus not only did we not reach the height we assumed (proficient versus expert) we were at risk of falling backwards from proficient to competent (i.e. forgetting).

Knowles' andragogy

The work by Malcom Knowles ties a lot of this together for us. Knowles taught us that adult learning was facilitated when we followed a certain set of principles. These include:

- Adults need to know the reason for learning something
- Experience, including errors, is the basis for learning
- Adults need to be responsible for their decisions on education and involved in planning and evaluation
- Adults are more interested in learning subjects having immediate relevance to their work and/or personal lives
- Adult learning is problem-centred rather than content-oriented
- Adults respond better to internal versus external motivators.

Applying the principles

I believe that physicians are very 'Knowlesian'. If all or at least most of these principles are not utilised in the planning and conduct of education activities then it will simply be less effective. So how might the above principles play out when designing education and when choosing activities that meet lifelong learning goals?

From the planning perspective, we need to have a clear understanding of the target audience and its needs. This may require literature review or at times survey data to understand the gap between their present state of knowledge and ability and their desired state of knowledge and ability. Once the gaps have been clearly delineated, then planners can decide what instructional design methodologies are best to achieve improvement toward the ideal state. Common active teaching methodologies include workshops, simulation and activities like in-situ mock codes. Lectures should be shortened and used as a preface to more active methods.

> "the best educational experience is achieved by using mixed methods and sequential exposure as the means to enhance the competency of the individual"

Interaction is key so discussions, extensive question and answer sessions, interviewing experts and pro-con debates are all more active than simple presentations. Even during didactic lectures methods such as short pauses for self-reflection by the audience, or having short periods of small group discussions are better than simply showing and speaking to 50 slides in a darkened room.

Mixed methods work better than singular method approaches. Having the learners complete pre-work, like reviewing an article, guideline or video allows learners to establish a common base before attending. The event then can focus more at the utilisation of knowledge and thus can be more workshop or simulation based. At times it can even be generative of new knowledge or approaches. Such an approach, where the primary work is done prior to the 'classroom' and the 'classroom' is dedicated to demonstrating competency is commonly referred to as a 'flipped classroom' approach.

Then subsequent to the event, maybe 30 or 60 days later, learners might be asked to link to a portal that includes case vignettes. This allows for an assessment of retention as well as applicability. Thus the best educational experience is achieved by using mixed methods and sequential exposure as the means to enhance the competency of the individual.

In addition to the planners utilising these approaches, physicians should use the core principles in choosing educational activities. If they merely choose based upon the location of the event or the number of credits available, the likelihood that they will learn and incorporate new knowledge and ability is quite low. However, when they take responsibility for their decisions on education and they seek out and attend education that meets the above principles, they are highly likely to incorporate new knowledge and ability and thus improve performance and outcomes. Sometimes this is referred to as a commitment to change/improve. We need to remember that we are also patients, and we want our personal physicians to make smart relevant choices in their educational content. If the above principles are followed then formal education sessions are less likely to fall short of our objectives. ■

Conflict of interest

Todd Dorman declares that he has no conflict of interest.

Suggested readings

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