



Large-scale education in respiratory medicine: content *versus* delivery

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Medical education on a large scale requires consideration of not only the content but also the delivery method. Optimisation of both elements improves the depth of learning achieved. <https://bit.ly/3TguwY2>

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Abstract

The respiratory literature, both written and in online formats, is growing exponentially. Capturing quality content, to meet the learning needs of those working in all fields of respiratory medicine and delivering it in a palatable, accessible format is challenging but paramount. In this article we discuss ways to determine the information content and review different methods of delivering this content to those who need it.

Introduction

Respiratory medicine knowledge, and the literature that supports it, consists of an ever-expanding reserve of textbooks, guidelines, journal articles, opinion pieces, statements, society podcasts, videos and many more formats. Having every healthcare worker aware and well versed in all of this knowledge and able to critically appraise it and appropriately assess the information is a lofty goal. The European Respiratory Society (ERS) is a European society with a global reach. In ERS Education we aim to provide quality information in accessible forms to help with clinical and scientific practice with the ultimate goal of promoting lung health, alleviating suffering from disease and driving standards for respiratory medicine. The content of these learning resources needs to be of a high quality, but they also need to be delivered in a way that is interesting enough to engage the learner, maintain their interest and have them retain salient elements with the goal of applying the knowledge to their practice.

When it comes to education resources we need to think of content and of delivery. The content of the learning material should drive interest and engagement. Delivery applies to how this content is made available to the learner. This encompasses both the format of the educational product and the delivery techniques employed by the teacher. Ideally both elements are optimised but with time and other resources being valuable commodities, should the scale tip in favour of one or the other?

Content

The opportunity for content, when it comes to educational offerings from the ERS, is extensive. The learning needs of the target audience should guide the content. This target audience includes trainees in respiratory medicine, trained specialists within a range of specific fields as well as health professionals and scientists who play key roles in these specialty areas.

The ERS first published the European core syllabus in Adult Respiratory Medicine in 2006 [1]. The drive to develop this document was based on the need to have common standards for training and certification within Europe to meet the needs of a more fluid movement of medical professionals and of patients. The process to update the syllabus and produce the updated, current version began in December 2014 and resulted in the published report of the outcome in March 2018 [2]. The development of curricula is an involved process including needs assessment and Delphi methodology. The Delphi technique is a systematic process using the collective opinion of panel members (in this case two separate groups:



an expert group and a public group). This structured method is commonly used in developing consensus among panel members in diverse fields of medicine. This is followed by rounds of expert discussion and fine tuning. The resulting document can be out of date by the time it is published.

The process of ongoing needs assessment to identify learning requirements of the target audience is required to sense the current trends and demands of the learners. Needs assessment is often defined as a situational analysis, a systematic process aimed at identifying and prioritising needs: collecting and analysing information; making informed, needs-based decisions; allocating resources; and implementing actions to resolve problems underlying important needs[3, 4]. To exemplify this real-life need, the curriculum update was published in 2018 and the following year a new respiratory disease emerged that would have immediate, intense and far reaching implications for the respiratory health community. Responding to the changing learning needs of a large society of learners is challenging.

To help address these challenges, the ERS is built around an assembly structure, where 14 individual groups represent the spectrum of respiratory medicine. These assemblies reflect the multidisciplinary team involved in patient care, research and advocacy within these disease groups. The directors of education meet regularly with these assemblies facilitating a “bottom-up” and a “top-down” approach to guiding content development. This is an active and responsive forum which facilitates discussion and sets up relationships to also respond to content needs between meetings.

Guidelines, reports and papers are available to read in unabridged forms if content is the sole goal of education, but delivery also has to be considered.

Delivery

The challenge of delivery is to package content into easily accessed, bite sized, snappy formats to facilitate mass distribution and generate further interest and transmission of the information. Involving the key trusted and renowned experts behind the frontier papers in respiratory medicine, who carry a certain celebrity status in this process, and supporting it with expertise in delivery should enhance the quality of the educational product.

A major goal of delivering education is to engage learners (figure 1). Learner engagement is defined as the amount of energy learners devote to the educational environment [5, 6]. Engagement can be broken down into behavioural, emotional and cognitive components [6]. It can be challenging to measure the level of engagement. Behavioural engagement can be assessed by reviewing the physical actions of the learner such as their participation in the class. Emotional engagement is assessed by inquiring after the positive or negative emotional reactions of the learner. This would include how the learner reacted to the material and interactions with peers or instructors. Cognitive engagement may be even more difficult to measure. This relates to how the learner perceives motivation to learn and the relevance of the content to them.

Education delivery has been irreversibly altered over the past few years with the COVID-19 pandemic acting as a catalyst for this change. Online learning resource platforms were growing before this pandemic, but have grown exponentially since. Classically, education was delivered in lecture halls with didactic teaching sessions [7]. The development of online learning resources has had many advantages, including

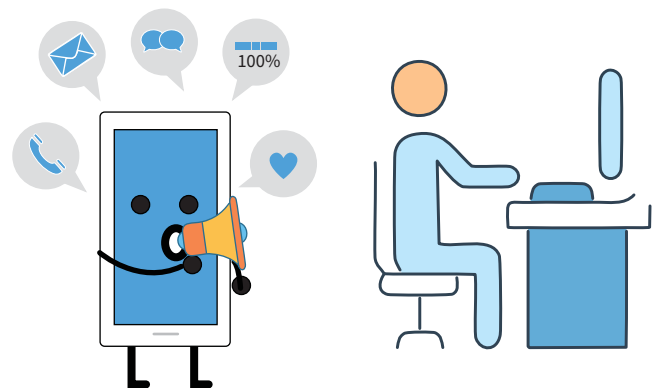


FIGURE 1 Challenges to assessing learner engagement.

TABLE 1 The Learner Engagement Inventory and Teaching Effectiveness Instruments

Learner Engagement Inventory
Internal engagement: emotional and cognitive out of class
1) I enjoyed this presentation
2) I was interested in this presentation
3) I will apply this presentation to my practice
4) I am motivated to learn more about this topic
External engagement: behavioural and cognitive in-class
1) I participated in this presentation
2) I avoided distractions
3) I was an active learner
4) I was absorbed in this presentation
Teaching Effectiveness Instrument Short Form
1) Speaker presented information in a clear and organised manner
2) Examples or cases were given that facilitated my understanding
3) The slides added to the effectiveness of the presentations
4) Speaker included opportunities to learn interactively
Response options for both instruments were as follows. 1: strongly disagree; 2: disagree; 3: neutral; 4: agree; 5: strongly disagree. Adapted from [6].

allowing distance learning and reducing carbon emissions in doing so, facilitating asynchronous online learning and fitting in with all schedules, taking down the walls of the classroom and permitting an almost limitless classroom size [8]. Critics of online learning list downsides of this approach: low learner participation, decreased relationships with peers and inadequate peer interaction [8–10]. The opportunity to network in the peripheries of the in-person learning environment is challenging, but not impossible, to recreate in the online forum. Options to develop small group discussions, share profiles or facilitate workshops can be achieved through communication technology.

A recent study of 159 learners investigated engagement over a 3-year period in a continuing medical education (CME) course [6]. The course was delivered in person for 2018, but transitioned to a livestream for 2020 and 2021, a predictable time trigger. The Learner Engagement Inventory and Teaching Effectiveness Instruments (included in table 1) were used after each presentation and the authors found that engagement did not significantly differ between in person and livestreamed CME. These results fit in with previous studies showing minimal differences between online and in-person learning [11]. This may be a result we want to hear but we have to be conscious that the action of “conversion” to the online format is not a straight use of a didactic lecture *via* online streaming without deliberate reworking to optimise online learning. Changing to an online format creates a whole world of new possibilities both in how we deliver content to the learner and faculty development to guide speakers through the process [12].

But is engagement of the learner really the end goal or are we looking for something more? Engagement is merely a starting point. Interactivity does not guarantee meaningful learner engagement. Our goal is a deeper, more impactful delivery of education that will filter down through the levels of the Kirkpatrick training evaluation [13]:

- Kirkpatrick level 1: Impacting on learner reactions and attitudes
- Kirkpatrick level 2: Achieving knowledge retention
- Kirkpatrick level 3: Achieving behaviour change outcomes
- Kirkpatrick level 4: Bringing about system change and patient care improvement

The literature supporting the impact of our education delivery becomes more scarce as we move up through these levels and understandably so.

With so many options at our disposal, it can be difficult to know where we should direct our energies. These options move past the constraints of slide presentations. Some options to mention are listed in table 2.

The pressures on delivery to keep pace with current content gives little time for expedited faculty development of hot topic presenters, but recognition of a need for core clinician educators to support delivery makes sense, whether this is on a large scale or a local teaching scale. The US model for the clinical educator pathway has changed over the past number of decades, with the idea of the “triple threat” model who was expert in clinical, research and teaching being challenged. The expanding pace of research

TABLE 2 Options for delivery of education

Delivery method of education	Description
Microlearning through social media	Succinct and appealing but glosses over the complexity of medicine and may risk over simplifying content [14] The unregulated nature of these platforms is also a concern
Podcasts	Audio recording, ideally <30 min Preferred as dialogue rather than monologue lectures and better with a conversational tone, personal anecdotes and humour to engage [15]
Videos/video discussions	Recorded videos, combining recorded images in a similar format to a podcast with two experts discussing a topic or a non-expert interviewer questioning an expert
Webinars	Synchronous or asynchronous content involving panel discussion with opportunity for audience interaction [16]
Game-based learning	Exert their education-promoting function by providing the possibility of combining learning activities such as feedback, testing and spaced repetition with active participation and autonomy as well as positive experiences for learners [17]

discoveries, the changing mechanics of biomedical research and the demand of funders to see a return on investment has led to a bifurcation of faculty to physician scientists and clinical educators [18]. This delegation should make collaboration between these diverse experts an attractive option.

Conclusion

The solution to developing time sensitive, expert content with optimised delivery will involve collaboration of these skill sets to see societies offer attractive, key education products with wide appeal in an expedited timeframe. This sees the syllabus being referenced but favour given to prioritisation of continuing professional development, especially emerging learning requirements. This can be expedited and optimised with the collaboration of the clinical educator, with education skills and broadcasting training, and the expert who has been involved in developments in the scientific and medical fields. Working together will facilitate up-to-date expert content being delivered in engaging, easily digestible formats.

Key points

- Content is not just based on a curriculum but on an ongoing needs assessment to sense current, up-to-date requirements.
- Delivery can take many formats: podcasts, videos, microlearning, webinars, gamification, etc.
- The impact of this learning can be reviewed in terms of impact in hierarchical levels: learner reactions and attitudes, learners' achievement of knowledge retention, learners' achievement of behaviour change outcomes, or achievement of system change and patient care improvement.

E. Kelly is the Learning Resources Director of the European Respiratory Society.

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