

CE CRAFT CORNER

Practical Strategies for Creating CME/CE Content: Insights From Adult Learning Scholarship

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ABSTRACT

Medical writers are instrumental in developing accredited continuing medical education (CME) for physicians and continuing education (CE) for nurses, pharmacists, and other health professionals. To ensure that CME/CE content meets the learning needs of health professionals, expands knowledge, and builds skills, medical writers should be knowledgeable about adult learning principles and emerging insights from the learning sciences. In this article, I review these principles and describe a suite of practical strategies that medical writers can use to write CME/CE materials that optimize learning.

Continuing medical education (CME) for physicians and continuing education (CE) for nurses, pharmacists, and other health professionals must meet standards for transparency and integrity as outlined by education accrediting bodies such as the Accreditation Council for Continuing Medical Education.¹ Medical writers are instrumental in developing accredited CME/CE materials with integrity for health professionals by ensuring balanced, valid, and unbiased content.² To ensure that CME/CE content also meets the learning needs of health professionals (otherwise known as learners), expands knowledge, and builds skills, medical writers in the field of CME/CE should be knowledgeable about adult learning principles (ALPs) and emerging insights from the learning sciences. This knowledge is necessary because incorporating ALPs into education content is likely to increase the effectiveness of CME/CE activities and their impact on the behavior of clinicians and patient health outcomes.³ The Alliance for Continuing Education in the Health Professions, a leading organization that promotes best practices in CME/CE, identifies ALPs as a core knowledge domain for professionals involved in CME/CE content development.

LEARNING FRAMEWORKS AND EDUCATION FORMATS

CME/CE activities help health professionals stay current

with the exponentially expanding biomedical and clinical information required to deliver optimal health care.⁴ However, the relentless accretion of this information can exceed a person's cognitive capacity—our brains can only absorb a certain amount of information at a time. Clinicians compare the experience of staying current with medical sciences and clinical practice updates with “drinking from a firehose.”⁵ At the same time, health care professionals need more from CME/CE than just information and facts. They also need to learn how to apply that information in clinical settings, exercise analytic and diagnostic skills, and communicate and coordinate with other members of the health care team.

To better support knowledge and skills application, the CME/CE field has embraced a lifelong, continuous, competency-based approach to education.⁶ Additionally, Interprofessional Continuing Education (IPCE) has emerged as an education framework in which 2 or more professions (eg, nursing, medicine, pharmacy) share a common learning process to learn with, from, and about each other. The goal of IPCE is to foster interprofessional communication and teamwork and the effective coordination of patient care.⁷ IPCE differs from multidisciplinary education, which involves health professionals learning separately about patient needs within the context of their own professional roles and responsibilities.

Modes of education delivery and formats have moved away from didactic lectures toward more interactive and engaging formats that can be delivered online. Many health professionals are digital natives and increasingly expect to receive much of their CME/CE via online activities and digital platforms (eg, e-learning modules, webinars, online games, patient simulations). The COVID-19 pandemic accelerated this trend toward online learning in accredited CME/CE.⁸ CME/CE now also measures learning outcomes via distinct frameworks that are sensitive to knowledge uptake, skills acquisition, and changes in clinical practice, performance, and patient outcomes.^{3,9} Moore's Model of Outcomes Assessment is a commonly used learning and performance outcome framework in CME/CE.⁹

Retrieval Practice: Before reading the next section, pause for a moment to think about the schemas or ideas you have about adult learning. Compare your schemas with the following information. What are the similarities? What are the differences?

ADULT LEARNING PRINCIPLES

Medical writers involved in developing CME/CE materials for health care professionals need to be able to incorporate ALPs into content to optimize learning outcomes. ALPs draw on legacy assumptions from twentieth-century educators and psychologists, including Malcolm Knowles, John Dewey, and others. These educators argued that teaching adults (andragogy) and adult learning differs from teaching children (pedagogy) and childhood learning. As such, adult learning requires a distinct education approach.¹⁰

Andragogy posits that adult learners learn best when they are self-directed in their approach to learning and intrinsically motivated to learn. Intrinsic motivation refers to the interest, pleasure, and satisfaction of learning itself.¹⁰ Extrinsic motivation refers to outcomes associated with learning (eg, clinical practice demands, improved patient care). In addition, adult learners actively seek learning when they have specific problems to solve and want to immediately apply what they have learned to real-life situations. Adult learners also bring a rich reservoir of life experience to the learning process that provides an important context for learning and a foundation for reflection. Finally, adult learners learn best when they have control over the timing, nature, and direction of the learning process.¹⁰

Box 1 summarizes practical applications of ALPs in CME/CE Writing.

INSIGHTS FROM ADULT LEARNING SCHOLARSHIP

Early twentieth-century adult learning theory focused primarily on differentiating adult learning from learning in childhood. A century later, adult learning scholarship now embraces cognition, memory, and brain structure and function, as well as how sociocultural, professional, and organizational contexts and social/emotional factors (eg, demographics, technology, stress) shape adult learning.¹⁰ The learning sciences are multidisciplinary and draw on scholarship from cognitive psychology, sociology, neuroscience, anthropology, behavioral economics, and other academic disciplines.¹² What follows is a sampling of insights and strategies from adult learning scholarship that medical writers can use to create CME/CE content that enriches adult learning.

Box 1. Practical Applications of ALPs in CME/CE Writing

Adult Learning Principles

1. Adult learners are self-directed.
2. Learning should be relevant to professional needs or social roles.
3. Learning should be problem-oriented and supports the immediate application of knowledge.
4. Adult learners appreciate opportunities for feedback and reflection.
5. Adult learners prefer control over the timing and direction of learning.

Practical Applications

Ensure that content is learner-centric, problem-oriented, relevant to practice, based on educational need, and aligned with anticipated outcomes.

1. **Consult the needs assessment.** Familiarize yourself with the knowledge/skill needs and the clinical practice/performance gaps presented in the needs assessment. A comprehensive needs assessment will help you understand the clinical gaps and anticipated outcomes that the education is targeting.¹¹
2. **Identify your audiences.** Who are the learners? What are their needs? What experience or background do they bring to the educational activity?
3. **Review the anticipated outcomes.** Identify the problem that the content needs to address. What do learners need to know or be able to do when they have read the material?
4. **Apply SMARTER goals to the content.** Keep the content Specific, Measurable, Action-oriented, Relevant to the learner, learning objectives, and anticipated outcomes, Time-specific, Evaluable, and Realistic.

Cognitive Learning Theory and Science of Memory Insights

What happens in our brains when we are in learning mode? Cognitive learning theories focus on the internal dynamics of learning and how people process, structure, and retrieve information. We absorb information via the senses (ie, sensory memory), which is processed in working (ie, short-term) memory and organized into schemas of increasing complexity.¹³ This processing builds on prior knowledge and is affected by cognitive load, which involves intrinsic load (the volume of information to be processed) and extrinsic load (the work required to process the information). Box 2 highlights tactics medical writers can use to manage cognitive load for learners and ease processing.

In learning mode, our brains work hard to encode, organize, and consolidate perceptions and experiences so we can retrieve that material in the right context, for the right purpose.¹³ Short-term and long-term memory work together with cues and context so that new information can be integrated with prior knowledge and consolidated or embedded more deeply into our internal archives or memory traces.

Box 2. Practical Applications of Cognitive Learning Theory and Science of Memory in CME/CE Writing

- **Stay on track.** Ensure that written content addresses the learning objectives.
- **Edit ruthlessly.** Reduce distractions and eliminate extraneous information.
- **Be bold.** Highlight essential points for the learner.
- **Build iteratively.** Sequence the presentation of ideas from simple to more complex.
- **Parse it out.** Chunk complex ideas into bite-sized portions of text.
- **Pair image with text.** Embed images, graphics, audio, or video clips to text where appropriate.
- **Offer opportunities for retrieval practice.** Include questions to encourage long-term memory retrieval and help learner connect new information with prior knowledge.
- **Promote active discovery.** Include exercises or activities such as matching, polling, or multiple-choice questions to help learners identify gaps between what they thought they knew and what they ought to know.

Forgetting and unlearning are also important in the process of learning new information.¹³

The multidisciplinary field of learning sciences, as described above, offers many empirically tested strategies that yield deep, durable learning.¹⁴ An important principle that Brown et al argue in *Make It Stick: The Science of Successful Learning* is that interactivity correlates with higher learning impact. The more actively learners engage with educational content, the more likely they are to retrieve and apply information in the appropriate context.¹³ To this end, instructional designers boost interactivity in e-learning by building effortful and repeated recall, recognition, and retrieval tactics into learning activities.¹⁵ Similarly, microlearning—delivering short bursts of content that are media-rich and spaced out over time—is thought to boost interactivity and retention by reactivating memory, avoiding cognitive fatigue, and more efficiently moving new information from short- to long-term memory.¹⁶ Box 2 summarizes tactics medical writers can use to bolster retention and augment interactivity.

Experiential, Emotional, and Social Learning Insights

Competency-based education and IPCE also benefit from insights on the experiential, emotional, and social nature of learning. In experiential learning, experience is considered an important baseline for reflection. Put simply, we encounter a problem (a concrete learning event); we take stock of our options for addressing this problem (we reflect); and we actively experiment in designing solutions to the problem (sometimes called “knowing-in-action”).¹⁷⁻¹⁸ Experiential learning often includes activities that involve self-appraising

current practice, identifying a problem in that practice, and problem-based learning as an individual or within in a team.

Emotional learning is another important consideration in adult learning. Working in settings and situations as any kind of clinician is often stressful and, at the very least, can provoke powerful emotions. Emotions affect how and what we learn via physiologic responses to situations and subjective experience of that response (ie, mood).¹⁴ For instance, when our mood is positive, we are more likely to absorb, retain, and retrieve information (ie, cognitive flexibility). We are more likely to see the bigger picture and apply new information to practice. Role play is an example of a CME/CE activity that might be used to explore how emotional states can impact both clinical practice and learning.

Emotional learning is grounded in social cognitive theory, which suggests that we learn more effectively when we are observing and interacting with others.¹⁹ Social learning occurs when we belong to a community of learners or a community of practice. Communities of practice are often self-organized and emphasize participation and collaboration as the key drivers of learning. Examples of CME/CE that optimize communities of practice include journal clubs and discussions via social media groups.

In competency-based education for health professionals, learners also need to be able to develop expertise and progress from novice to mastery levels of competence. The trajectory toward mastery requires deliberate practice, a key ingredient in information processing and skills acquisition that involves effort, repetition, and feedback.²⁰ Deliberate practice is a common characteristic of virtual simulations or case- and vignette-based activities. Cases and vignettes are designed to mirror real-world challenges in health care and enable learners to practice reasoning, communication, and procedural skills. In online environments, patient cases are often highly interactive and are accompanied by feedback that offers insight into the consequences of learner choices, guides the learner toward an end goal, and allows room for failure and course corrections.²⁰⁻²¹ Examples of written feedback include expert or virtual patient commentary or notes about clinical outcomes that occurred because of decisions the learner made in the activity. Box 3 highlights tactics medical writers can use to incorporate experiential, emotional, and social learning insights into the development of CME/CE activities.

CONCLUSION

CME/CE continues to grow as a field and as a market for medical writers. Market forecasts project a 5.9% growth (\$2,715.22 million to \$3,830.46 million) between 2022 and 2027.²² Health professionals are required to earn CME/CE credits as part of maintaining their professional licenses

Box 3. Practical Applications of Experiential, Emotional, and Social Learning Insights in CME/CE Writing

- **Build reflection into the text.** Use open-ended or polling questions to encourage learners/readers to actively think about how to apply the presented information to clinical practice.
- **Flex your metaphor muscles.** Metaphors can help learners integrate new information into clinical practice.
- **Emphasize context.** Where possible, describe the clinical, professional, and organizational context in which learners are expected to apply new information or skills. This helps to situate learning in relationships and communities of practice.
- **Use storytelling to engage learners.** A story-based approach to content through patient cases or vignettes promotes clinical problem-solving and deliberate practice. Storytelling also establishes learner empathy with patient experience.
- **Deliver concrete, constructive feedback.** Feedback delivered in small, digestible chunks diffuses defensiveness, minimizes negative emotional responses, and reduces cognitive load.²¹

but are extremely busy, and their in-the-moment learning capacity is affected by many factors, including specialty, proficiency level, and workplace setting. Our goal as CME/CE writers is to help health professionals process, synthesize, and apply new information effectively in the relevant context. We can help to move learners from what they know and can already do toward what they need to know and apply in practice by using ALP strategies to guide content development.

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