Self-directed Learning: a New Look at an Old Concept

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Commentary

Given the ever changing knowledge and practice of medicine, it is crucial for physicians to continuously learn new information and refine their skills throughout a career spanning decades. Effective self-directed learning (SDL) requires training, akin to other clinical skills, and is now a focus of our medical education system. While conceptually based in learning theory [1, 2] and required by accreditation bodies for medical schools as well as graduate and continuing medical education, instruction in and assessment of SDL poses challenges for educators [3, 4].

We conducted a workshop at the 2018 annual meeting of the Association of American Medical Colleges; over 100 participants joined to discuss successes and challenges associated with SDL in medical education. Educators across the continuum are interested in understanding how SDL can be cultivated during preclerkship and clerkship experiences in undergraduate medical education (UME), while fulfilling service needs of graduate medical education (GME), and within the hectic professional lives of physicians in practice. Several questions emerged, largely centered on the following: (1) Have we adequately identified the elements that distinguish a self-directed learner, including personal characteristics such as curiosity? (2) Does one truly foster SDL in medical education and practice with specific "exercises" or does this require a culture change in how we teach throughout all courses and in all settings? To meet accreditation requirements, many educators have developed activities and programs that can be used to check the boxes but may not support the desired skill development.

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At present, the standards promulgated by the Liaison Committee on Medical Education require SDL to take place as a unified sequence; learners must identify, analyze and synthesize information relevant to their learning needs, share that information with their peers and supervisors, assess credibility of sources and receive feedback on their information seeking skills. Residency common program requirements similarly state residents must self-identify strengths and deficiencies, set learning and improvement goals, and locate, appraise and assimilate evidence from scientific studies. Continuing professional development (CPD) expectations include the ongoing pursuit of SDL throughout one's career. However, it is not clear that all medical educators know or agree on the best methods to support this development.

Components of SDL are woven into medical education to varying degrees. Problem and case-based learning and flipped classroom exercises are increasingly utilized in UME and train learners in relatively straightforward SDL, i.e., finding factual information, yet often require specific goals and coaching from faculty to achieve student growth in this area. A number of educational programs have components that collectively cover all elements of SDL, but not as a unified sequence. UME educators in particular face a number of issues: Is the sequence essential for all exercises? Can one teach component parts of SDL and integrate them at a later time? One might be adept at identifying a learning gap but struggle with developing strategies to fill the gap. Alternatively, a learner may be repeatedly plagued by the fallacy of understanding [5] and consistently overestimate her knowledge. GME initiatives to foster SDL primarily rely on resdients to recognize and fill gaps while working clinically. Efforts to aid trainees in closing gaps via role-modeling and self-directed deliberate practice with direct observation and feedback are limited due to faculty skill sets and demands on faculty time. SDL as part of CPD programs is currently being explored. The majority of physicians in practice were not formally trained in SDL, limiting both their comfort with participating in and supporting programs related to SDL.

As we seek to advance SDL throughout the continuum, part of the problem may lie in the limited framework many use for SDL. Consider a surface or superficial level self-

directed learner. I have a patient who smokes cigarettes and wants to quit; I realize I don't know much about smoking cessation therapy so I plan to find some review articles on the topic, read them, and discuss my thoughts with a colleague; it's pretty straightforward. Now imagine a deeper or more complex challenge: in the last few weeks I cared for two patients with atrial fibrillation and rapid ventricular rates; one was hypotensive and the other was not—why? This requires a different level of metacognition and curiosity than the first, as well as the ability to engage in a more complex search strategy that doesn't fit neatly into into a conventional search engine.

In addition, the approach to SDL needs to be integrated into the daily work of trainees and physicians; this is critical to address the issues noted above, to achieve expertise in SDL, and ultimately the adaptive expertise needed in practice. We strive for an underlying curiosity and informed self reflection on one's practice that routinely launches our physicians in training into SDL, the desire to know not just what to do but why we do it; SDL is a habit of mind and not a tool that is picked up or not used. Perhaps we need to broaden our SDL framework to encompass these ideas and consider SDL as a construct that embodies the process elements associated with self-regulated learning (identification of gaps in knowledge and understanding, creation of strategies to fill the gaps, and assessment and adjustment of one's learning [6]) as well as the characteristics of the learner (e.g., curiosity) and the culture of the learning environment (e.g., interactions with faculty).

Once we accept a definition and framework for SDL, it is important to identify how to recognize when it is occurring [7]. To date, the emphasis has been on the process by which one identifies and fills a particular knowledge deficit; however, we may need to shift our focus. It may be helpful to use clinical reasoning as an analogy. Clinical reasoning and its related components (cognitive bias, heuristics, etc.) is a complex cognitive task, frequently deconstructed, learned in stages over time, and then synthesized effectively. Ultimately, we care about the outcome of reasoning, not just the process. Was the diagnosis accurate or flawed. Similarly, rather than rigidly define the steps and sequence of the SDL process, it may be more effective to define the outcomes and methodologies for measuring them that are appropriate at various stages in the medical education continuum.

We offer the following suggestions as a way to advance SDL throughout the medical education continuum in the absence of data about what works best and while in pursuit of additional valid and reliable methods to assess SDL [8].

- Reconceptualize SDL to take into account not only the straightforward inquiries amenable to the SDL process but also the personal and environmental characteristics necessary for identification and correction of deeper, more complex gaps in understanding.
- Allow flexibility in methodology to achieve SDL and utilize knowledge, reasoning or practice outcomes rather than a process to define achievement of SDL skills.

- Encourage research on development of tools and outcome measures to demonstrate SDL skills in preclerkship and clinical settings throughout the medical education continuum.
- Recognize SDL as a habit of practice and engage in a national conversation to develop a research agenda to determine evidence-based "best practices" to develop and sustain this habit in UME, GME and as part of CPD.

Through advancement of our conceptualization of SDL as well as the methodological approaches and ability to measure outcomes of SDL, we can better prepare and maintain the skills of our physician workforce to meet the needs of our patients and society now and in the future, and to support careers that will span many decades.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval N/A

Informed Consent N/A

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