

Active learning: a resident's reflection on the impact of a student-centred curriculum

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Abstract

Classic medical education pedagogy typically involves the model of an active teacher and a passive student. There has been a shift in education theory to a more student-centred approach, and this is being reflected in resident education. Concepts, such as "competencies," "curricula" and "objectives," are becoming part of the fabric of the residency training equation. The University of British Columbia Department of Urologic Sciences had previously created a urology residency curriculum for its 15 residents in 2000. This curriculum was based on competencies and objectives outlined by the Royal College of Physicians and Surgeons of Canada. In an attempt to address a required change in the formal curriculum, an "accidental" student-centred curriculum emerged. This paper outlines this active learning approach, its benefits and challenges in implementation.

Can Urol Assoc J 2009;3(5):399-402

Résumé

Le modèle pédagogique classique en médecine comprend un enseignant actif et un étudiant passif. Un changement théorique vers une approche davantage centrée sur l'étudiant est en cours, ce qui se reflète dans la formation des résidents. Des concepts tels que « compétences », « cursus » et « objectifs » sont maintenant intégrés dans l'équation de formation des résidents. Le département des sciences urologiques de l'Université de la Colombie-Britannique a mis sur pied un cursus en urologie pour ses 15 résidents en 2000. Ce cursus était fondé sur les compétences et les objectifs identifiés par le Collège royal des médecins et chirurgiens du Canada. Au cours du processus de modification du cursus officiel, un cursus « accidentel » centré sur l'étudiant est apparu. Le présent article définit cette approche pédagogique active, ses avantages et les difficultés en lien avec sa mise en application.

Introduction

Classic medical education pedagogy typically involves the model of an active teacher and a passive student. There has been a shift in education theory to a more student-centred approach,^{1,2} and this is being reflected in resident education.

In the summer of 2006, based on previous resident feedback, it was identified that the Department of Urologic

Sciences at the University of British Columbia (UBC) required a restructuring of its urologic curriculum, in place since the fall of 2000. The curriculum had been based on a reference text that had been in print for 5 years and a new edition of the recommended textbook was pending for later that year. In addition, the Royal College of Physicians and Surgeons of Canada (RCPSC) test committee had mandated that the scope of eligible reference material for the certifications examinations in urology would soon be broadened to include peer-reviewed journal articles and the American Urological Association "Update Series."³ In addition, the RCPSC mandated a curriculum that incorporated teaching the 7 CanMEDs competencies (medical expert, communicator, collaborator, manager, health advocate, scholar and professional).^{3,4} These domains parallel the American College of Graduate Medical Education core competencies (patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism and systems-based practice).⁵ Given these imperatives, a revised curriculum that incorporated this new material was required.

Methods

A curriculum committee comprising the 3 final-year residents and the program director was convened. As residents, we were familiar with a teacher-centred approach. Most previous teaching sessions consisted of chapter reviews and question-and-answer sessions. Given the new reference materials and objectives, we recognized the need to make the following changes: (1) shift to resident-driven content, (2) address CanMEDs requirements³ and (3) incorporate the new reference material into our learning.

For several months, a new academic half-day curriculum that reflected these changes was created by the committee. The weeks were based on themes. For example, a theme such as urolithiasis was reflected in the groupings of articles selected for that week. As well, a faculty expert was assigned for the week to guide the topic discussion and articles reviewed. The changes included adding a weekly review of 4 selected urologic papers. To involve residents at all training levels, the papers were spread out over the 13-week winter term. Third- to fifth-year residents were responsible

for summarizing and presenting the topics to fellow residents. In addition, each resident had to create 2 to 3 short-answer or multiple-choice questions for his or her assigned paper. Exam questions modelled on the historical RCPSC format were created from their assigned papers and reviewed as a group. To address CanMEDs competencies, the program director increased the weekly schedule with appropriate seminars. An example of this was a guest lecture on financial planning that addressed the competency of “physician manager,” and a seminar from a regional health advisor on understanding health care infrastructure that addressed “health advocate/professional.” The authors observed 3 phenomena: (1) resident buy-in, (2) a pedagogical shift from passive to active learning and (3) resident empowerment.

Resident buy-in

As fifth-year residents, we outlined our new curriculum to the residents. They resonated with the changes and there was prompt resident buy-in. They felt the tasks were manageable, achievable and important to their learning. The residents managed their schedules themselves. If a resident was unable to satisfy the assignment, they pre-emptively switched with a fellow resident. The residents would present their material as they would like to “study” or “learn” it. Residents became “content experts,” spawning discussion about the relative usefulness or clinical relevance of the various articles. Many discussions arose from the residents’ creation of the exam-style questions; residents began to shift to an “application” level with their knowledge. They began navigating the waters as novice exam writers. As a result, they approached the resources differently, often creating notes and presentations in a question-and-answer style. These presentations were to be used as study notes by the group. The result was a curriculum that was resident-run. Education literature highlights the importance of “buy-in” of both faculty and residents for the success of educational initiatives.^{1,2} In this circumstance, resident buy-in was the result of a positive learning environment and a need to prepare for both the urology in-service exam produced by the AUA and RCPSC final examinations.

Pedagogical shift

Central to the understanding of active learning is the philosophical shift to constructivism. People construct knowledge based on previously held beliefs and experiences.¹ This process is a dynamic interaction between the learner and the experience.⁶ The philosophical basis of critical thinking and higher-order thinking skills is the constructivist premise of learning through experience.⁷ The learner is central

to the constructivist philosophy; specifically, knowledge is constructed by the individual and not passively acquired.⁷ The student assumes self-directed learning with an emphasis on active participation, critical inquiry, self-regulation and self-assessment abilities.⁷

Active learning is a metacognitive process, defined as the ability of the learner to monitor his or her current levels of mastery and understanding, thereby providing the individual with a picture of how he or she learns.^{1,2} During active learning, the student takes control of his or her learning.⁶ Specifically, Bonwell and Eison define active learning as “anything that involves students in doing things and thinking about the things they are doing.”⁸ This is a learner-centred approach that emphasizes the needs of the individual learner as opposed to the group-learning process. The taxonomies of active learning are numerous. Graffam¹ highlights 3 key components: (1) intentional engagements, (2) purposeful observations and (3) critical reflection. Intentional engagements are purposeful learning experiences (for example, taking a medical history), where students perform what we want them to learn. Purposeful observations are where learners watch and listen to someone doing what we want them to learn. Finally, critical reflection brings all 3 components together, where the learner makes meaning out of their experience and information. This brings the learning process out of the unconscious.¹

The outlined shift to a “resident-as-teacher focus” reflected active learning. In the UBC example, students had intentional engagements when asked to prepare questions and mini-lectures for their peers. Purposeful observation occurred as junior residents and medical students watched and listened to senior residents’ presentation and discussion. Finally, critical reflection was stimulated by group discussion of prepared questions or mini-lectures. Gunderman and Wood outlined that the process of understanding student’s expectations, students acting as teachers, the creation of questions and post-examination discussions are means for stimulating active learning.² Active learners create an action but also reflect on that action.⁶ Graffam’s article outlines the practical benefits of increased knowledge and recall for the learner with an active learning approach.¹

Resident empowerment

For the UBC residents’ curriculum, residents were included from the onset of the new curriculum. They were the targeted learners of this curriculum. Informal discussion during the curriculum development process acted as a needs assessment of the residents. Kern and colleagues suggest that the “needs assessment of targeted learners” is a crucial step in curriculum development.⁹ In the new curricu-

lum, residents acted as teachers, created exam-style questions and debriefed the students on those questions; as a result, each of the strategies outlined by Gunderman to promote active learning was used.² This process significantly increased residents' deep learning of the material. The process of deep learning is achieved when learners themselves work to organize and contextualize content and continually revisiting and revise their conceptual framework.² More time is devoted to asking questions and discussing possible solutions. This facilitates the learner to form associations between knowledge and experience, rather than just adding more facts.²

While residents continued to "own" this learning and became empowered by the ownership of their learning experience, the weight was lifted off the faculty expert. Residents created their own questions, prompting debate and discussion. Faculty could truly act as an "experts," while residents deferred to them on specific clinical examples or clarification of the literature. A more conducive learning environment emerged as a result of the residents facilitating the question-and-answer sessions instead of faculty. During the process of active learning (the objective of deep learning), teachers act as "learning facilitators," helping students reach their own conclusions.² Involving the residents in the planning process was critical to the success of this curriculum. Active learning involves both the instructor and the students working in cooperation.¹ Parikh and colleagues suggest that active learning in a competencies-based curriculum improved the residents' perception of the quality of their education and the commitment of the faculty to the educational mission.¹⁰ Specifically, results showed that residents reported a statistically significant improvement in the program's ability to prepare them to meet the expectations of outlined competencies. In addition, resident's evaluation of faculty teaching and mentorship was also improved with a competencies-based, active learning curriculum.¹⁰

The impact of active learning

This well-defined curriculum helped final-year residents prepare for their certification exams. However, an even more effective tool was residents preparing each week to act as a resource for other residents in the learning process. Given that the residents were reviewing the articles, senior residents felt they needed to know the breadth of basic knowledge to be able to comment on differences noted in a new article. The compelling nature of peer-driven learning seemed a unique phenomenon. Learning became motivated by the social context of resident inter-dependence. Schwartz and colleagues described that the feeling of contributing some-

thing to others is especially motivating to learning.¹¹ Mutual respect is developed among peers as they begin to rely on each other for "food for thought." A safe learning environment was created and all residents (senior and junior) became included in the academic discussion.

It would be incorrect to say that we anticipated all these results to occur. Our original intention was simply to address the gaps in the curriculum; hence the "accidental" active learning curriculum.

The challenges

No curriculum is complete without challenges. Challenges for this curriculum were maintaining resident momentum and faculty buy-in over the course of an academic year. During busy clinical times, it was often difficult to complete the tasks required. Although the residents remained committed to the learning tasks, the momentum was largely dictated by senior residents and the program director. A group of committed, consistent and enthusiastic residents is required for the success of an active learning program.

Faculty buy-in to this shift in teaching style was variable. Teachers in medical school generally teach as they were taught in undergraduate or graduate school.¹² Given that most physicians have no formal pedagogical background, most faculty members will teach as information-imparting instructors.¹³ Faculty often feel vulnerable when facing a new and unfamiliar teaching technique. A flaw in our curriculum design was the lack of transitioning exercises for the faculty placed into this new teaching model. Again, the active-learning paradigm requires that the instructor and student work cooperatively and not in isolation.¹ Curriculum development is a dynamic process. Faculty need to be enabled and invigorated to strengthen and facilitate the new curriculum. Kern and colleagues suggest that faculty development, targeted towards the needs of the specific curriculum, is important for success.⁹

Conclusion

Active learning occurred by accident during the creation of a new urology curriculum. The shift in pedagogy resulted in deep learning, motivated learners and a resident-directed curriculum. Paramount to the success of such a program is cooperation between learner and instructor, as well as resident and faculty buy-in.¹ Research in active learning demonstrates that student involvement in the learning process leads to deep learning and metacognition.² These learning attributes will aid residents in solidifying their practical and didactic knowledge. The UBC urology curriculum reflects that active learning definitely has a role in residency education.

Mickelson et al.

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This paper has been peer-reviewed.

Competing interests: None declared.

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