

A submission to the Military Education Working Group: This abstract is meant as an individual talk, but the topic would be very interesting for a roundtable discussion on teaching fundamental science courses to Officer Cadets, or perhaps a panel of experts.

Strategically placed relevance: Situating the cadet to achieve increased engagement in Introductory Military Chemistry

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At the Royal Military College of Canada (RMC), future Officers of the Canadian Armed Forces (CAF) are educated following a four-pillar program: military leadership training, physical fitness, bilingualism (French and English), and academics. Although all aspects must be passed successfully in order to graduate from RMC, it is the academic pillar which requires the largest commitment from students, resulting in a four-year university degree that adheres to strict quality assurance guidelines and is recognized by the Province of Ontario. Depending on the military trade chosen by the student, the academic pillar is also often the most difficult to relate to their future careers as Officers. This is especially true of general service courses in science, such as first year chemistry, where an electrical engineering student, as an example, may ask themselves why they need chemistry and what's in it for them. These thoughts and general lack of interest ultimately lead to lack of engagement by the student and an eventual struggle to pass the course. One way to combat these issues and increase student buy-in and success is by adding relevance.

A general chemistry course is still expected to introduce the fundamental concepts in molecular science, but as educators in a military setting, we are increasingly conscious of how we embed chemical practices within the military context. The instructor's choices in this respect matter: how well a student's own values and priorities align with those that they come to associate with chemistry will be a determining factor in how they view the utility of chemical knowledge in the future they wish to build. The first year experience must also demonstrate that chemistry is a viable framework for understanding and contributing solutions to a wide scope of complex military challenges.

The introductory chemistry course at RMC has been restructured to better meet the needs of our students. Knowing that our students have chosen a military career path, and therefore have a common set of interests and values, the content and structure of the course has been designed to highlight the role of chemical concepts and practices within military knowledge systems. Lab and lecture content has been updated to include examples, demonstrations, and experiments relevant to the students' chosen military identity. Structural changes similarly reflect values of teamwork, clarity, consistency, and care for the well-being of subordinates. The inclusion of military faculty lends credibility to the military contextualization. Dividing into smaller sections for tutorial discussions affords the chance to explore chemical problem-solving in a wider variety of

dimensions. Inclusive team building efforts foster trust and ease communication. These aspects can also be considered small-scale examples of the strategic importance of alliances and partnerships to successful military operations. These experiences have strengthened student identification with chemistry, improved motivation to study course material, and steadily increased enrollment in Chemistry and Chemical Engineering in upper years. Engaging with student expectations about the skills they will need to fit the roles they want has helped us to situate chemistry within the larger social knowledge framework to effectively shape and satisfy their first year experience.

This talk will focus on our approaches to increasing student engagement by leveraging the common military relevance in the material. The discussion will involve an expansion on the fundamental aspects of learning that relate directly to the success of this approach. Increasing relevance in service courses increases the students' sense of belonging in the military community, boosting confidence and morale, two traits that will permeate into other areas of their development and ultimately lead to more well-rounded and socially conscious officers.