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# Student and Employer Perceptions of Skill Development and Career Preparation in Undergraduate Geoscience Education at a Canadian University

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Undergraduate education forms the foundational knowledge used by professional geoscientists in their careers after graduation. However, the skills that students have the most opportunities to develop in undergraduate geoscience programs are not necessarily those most valued by future employers. To address this uncertainty, over 150 alumni and employers associated with the University of Waterloo Department of Earth and Environmental Sciences were surveyed to identify the skills that they value most highly when hiring and training junior geoscientists, and those they wish they had spent more time developing during their own geoscience education. Comments were aggregated into six general skills (Adaptability, Communication, Initiative, Interpersonal, Reasoning, Self-Management) and six technical geoscience-specific skills (Conceptualization/Systems Thinking, Data Management, Field/Laboratory, Professional Geoscience, Numeracy/Software, Technical Communication). Over 100 undergraduate students were then surveyed across eight 4$^{th}$-year Geochemistry, Geology, Geophysics, and Hydrogeology courses. Of the 12 skills, students were asked to identify those they believed employers value most highly in junior geoscientists, those they felt most confident in, and those they felt least confident in. For some skills, such as Communication and Field/Laboratory, students correctly perceived them to be most valued by employers and indicated they were most confident in their own abilities. However, for other skills such as Reasoning and Interpersonal, many students perceived their value to be low and indicated they were least confident in their abilities, despite them also being highly valued by employers. Interestingly, >30% of alumni and employers also highlighted the importance of Professional Geoscience (e.g., project design, feasibility, and management) and Numeracy/Software skills later in their careers, despite not being as important when hiring and training junior geoscientists; >60% of students also identified these as being the technical skills they felt least confident in. Some underdeveloped skills can be addressed by modifying existing assessments and teaching practices, while others may need to be incorporated through new courses or types of learning. These surveys serve as a model for improving curriculum reviews and provide critical information to support geoscience educators in continuously innovating course content and delivery and ensuring that undergraduate geoscience programs are setting students up for success after graduation.