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Critical Competencies for Successful New Geoscientists and Approaches for Equipping the Next Generation

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Most developed countries are facing critical challenges in future technical labour and in retaining institutional knowledge because of the ongoing retirement of baby boomers. In the United States, these challenges continue even with the slowdown in hiring in the energy and mineral sectors as increased demand in the environmental and engineering sectors and continued demand in non-traditional sectors provide opportunities for new graduates. The success of new hires, as demonstrated during the current slowdown, has been highly dependent on a number of critical skills, which have in addition improved their employment resilience during layoffs. Among these, technical competencies dominate with demand for strong quantitative skills, field experiences, research experiences, and robust communication skills. Additionally, new hires report the benefit of programming experience as being a critical differentiator.

Other professional skills, such as business process, regulatory compliance, and ethics are often cited by employers as key assets for new hires. We will look at data collected from AGI's various surveys, including its Geoscience Student Exit Survey, and its recently completed Master's Preparation of Geoscience Competencies study.

One challenge often cited by educators is how to enable students to acquire these skills during their education. Higher education in the U.S. is facing increasing pressure to graduate students with only 120 credits, which greatly limits the amount of time available for appropriate coursework. One result of the recent U.S. National Science Foundation-funded Summit on Undergraduate Geoscience Education series was emerging concepts on how to meet the skills targets in the limited timeframe. This includes identifying mechanisms to integrate critical competencies into existing courses, and crafting new concept courses that focus on these critical skills, but framed in a geoscience problem context. These concepts are ripe to be integrated into other established modes, including instilling the concept of lifelong learning during the formal education program and enabling access and credentialing for asynchronous online courses. We will explore the range of options and examples of implementation to facilitate meeting market needs, as well as identify emerging motivators for new graduates to engage in these progressive approaches.

