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The concern around recruitment of HQP is not solely limited to mining companies but also extends to academia, where mining departments face similar challenges. In 2005, nearly one-third of the faculty in Canadian universities were 55 years of age or older, and the situation in the U.S. is even more dire, with more than 50% of all mining faculty eligible for retirement in 5 year or less. All Senior Mining Engineering (Academic) Staff may have to be replaced by 20204. Getting new candidates into the pipeline as challenging, with PhD completing rates of 4 years at only about 8%¹⁵, and there is a decided lack of PhD candidates with any significant post bachelor industry experience. In this case, in the authors' experiences, completion times and failure rates are much higher as many are also working in parallel, have family obligations, and are often under pressure from private industry for employment opportunities. In the face of a wave of faculty retirements in the near future, university mining departments typically hire two new professors every five years¹², where a shortfall of qualified candidates is a contributing factor to the closure of some mining departments^{13,14}.

EDUCATIONAL PARTNERSHIP PROGRAMS

It is difficult to imagine a modern, globally connected mining company that is not keenly aware of the critical nature of personnel shortages world-wide. Juniors, mid-tier and majors all have the same problem. How do deal with it is another matter. Approaches range from:

- Doing little or nothing (either due to a lack of resources with which to do anything, a wait-and-see approach, or that their personnel demands are being satisfied)
- Focusing on awarding scholarships
- Sponsoring of specific events
- Providing mentor/leadership services
- Hiring of summer interns (with the intent of demonstrating commitment and building a talent pipeline),
- Committing significant financial resources for either dedicated projects, or general usage.

How a particular company decides which school(s) to develop a relationship with depends on elements which might

include geographic proximity, the value of having specific areas of expertise with an institution vs. company needs, or could be as simple as being the alma mater of the company CEO. However, these programs can be a real challenge to sustain, and continually re-justify, particularly when those resources are targeted on educational programs. Educational programs can be perceived as being intangible (as opposed to research programs which typically have definable targets and deliverables) and have a long lead-time needed to bear fruit. Rio Tinto, like most major companies within the industry, is aware, and has been addressing the problem through the Educational Partnership (EP) program where-in top tier universities worldwide are targeted for ongoing corporate level financial support, and combined with collaborative, hands-on, focused and measurable accountability (no giveaways).

THE SURVEY, WHAT IT WAS, AND WHAT IT WAS NOT

In anticipation of expansion of the Rio Tinto Educational Partnership program to North America, the mining engineering departments (or equivalent) of The Colorado School of Mines, The University of Arizona at Tucson, and The University of British Columbia were each approached concerning the possible nature of a relationship. The criteria for which universities were chosen to approach was based in part on the author(s) standing relationships with each, past recruiting successes, and the informal criteria that they:

- Represent world-class universities with emphasis in Mining Engineering,
 - Offer complementary degree programs important to mining (i.e. civil, mechanical, geological engineering, metallurgical engineering, etc.),
 - Have strong student enrollment in Mining Engineering, and,
 - Have a strong interest in working with Rio Tinto on such a program to enhance, improve and grow the academic side of their programs (as opposed to research).
- These three met those criteria, as well as the impression that their academic emphasis and make-up of students' met the needs of Rio Tinto. While there are certainly other outstanding institutions with North America, you have to start somewhere (and can always expand later). The selection was also based on the fact that that these institutions also:
- Have at least two-degree working relationships with each other*,
 - Historically been open to alternative/innovative programs and approaches to education,
 - Could potentially form a three-degree North American Educational Partnership network, and
 - Would potentially form a strong core group needed to gain critical mass.

*Note: There is a pre-existing working relationship between U of A and UBC (teaching of select classes via distance learning techniques and technology) as well as one between U of A and CSM (a joint program for mine safety given the two schools also have the only functional underground mines in North America and are used for instructional purposes, mine rescue, hand-on skills practice).