

Employing small groups to promote independent learning and to develop social skills

Clive Knobbs

The United States Army at Westpoint, where they train and develop officers for combat duty, follows a model that has been adopted by sections of the Harvard Business School in its MBA programme. The model deals with "being", "knowing" and "doing".

This can, interestingly enough, be nicely superimposed on the Massachusetts Institute of Technology (MIT) model of conceive, design, implement, operate (CDIO) in engineering education and the "thinking" psychometric model of the Herrmann Brain Dominance Instrument (HBDI). It has been referred to as attitude, knowledge and skills in certain quarters, so it's not entirely new, like many models.

The first semester of the University of Pretoria's Underground Mining course, PMY 410, started with the psychometric testing of 31 students. The results were not only used for selecting groups, but also for addressing the "being" component of the Westpoint Model ("know thyself", as the ancient Greek aphorism on the Temple of Apollo at Delphi exhorts us to do) – the intrapersonal skills, such as self-awareness and assertiveness.

However, knowing others is also important, and students were encouraged to discuss their profiles with other members in the group and to familiarise themselves with similarities and differences, and the implications of this for performance in the group. "Knowing" refers to hard technical knowledge, the core of what engineers need to learn about their profession. "Doing" is getting the job done, and here social or interpersonal skills, such as empathy, communications, conflict handling and relationships are a *sine qua non*. Initially, not everyone saw it this way.

"This subject is suppose [supposed] to be mining methods with [which] is a purely academic subject. Writing this what I'm doing right now is like sitting in a phycology [psychology] class. I don't like it...feelings is for the phycologist [sic]."

This was a comment made by one of the students a few weeks into the course. It's a fair question and statement from a student in his final year of mining engineering! His retort

(let's call him Student Q) was one of many pronouncements, not all so strident and trenchant, but inquisitive and seeking explanation without baulking at the programme completely. The students were commenting in a reflection paper on the "prolific" use of

small groups for teaching and learning both content and skills. Constant feedback was vital for me in gauging the climate in the groups.

"This has a place, but not at the expense of technical matters."

This was the response of Student A when asked to submit an opinion paper based on the findings of three published papers dealing with the whole question of soft skills for engineers. In addition to summarising and discussing the papers in groups and in the class, students were asked for a personal opinion on the findings in the papers. Another opinion was the following:

"This is an essential component of learning to communicate our ideas and projects as engineers."

"Nothing we learn is more important than the skills to work cooperatively with other people."

- Johnson and Johnson



→ Students in Mining Engineering practise their soft skills.

The pronouncements ranged between the extremes displayed by Student Q and Student A, but generally there was acceptance of the importance of social skills. Are they important? Should we start at university? How can we maintain a balance, or better still, integrate the two forms of education?

As expected, most controversy emanated from working in groups, working independently at home and a paucity of input from the lecturer.

The groups were selected on the basis of results from a number of psychometric tests. Race and gender were also determining factors. The size started at five to six, but was later reduced to three to four members per group to minimise the “free-loader” situation. The groups changed every four to six weeks to give greater exposure to working with different personalities and characters. Technical topics were first discussed in the small groups, prompted by questions, which were different for each group. After 20 to 30 minutes of group deliberations, answers or viewpoints were presented to the full class by each group. I decided who in the group would make the presentation. The debate on the subject would continue in the full class.

Independent learning was inculcated by distributing (ClickUp) papers,

articles, references to chapters in books and the like in the week prior to discussion and debate. Between 15 and 20 pages had to be read in preparation for the following week, which consisted of five lecture periods. The following was a frequent refrain:

“I feel overwhelmed by the amount of work and become scared that I might not complete reading all documents by test week.”

My involvement was peripheral in a way and muted by design. To give pat answers, particularly in mining engineering where there is always more than one way of doing things, seemed short-sighted and counterproductive. I was looking for an understanding of the principles and applications under different circumstances. The generation of alternative solutions was my aim, and an appraisal of the merits or otherwise of each alternative. My reticence to giving firm solutions was met with unease and confusion by half the class. They wanted more direction, clarity and guidance, as they had received in the past in their secondary education and in the early years of their university education. My involvement was inadequate according to many. The lecturer as “coach” or “mentor” was indeed a foreign, unnerving experience, which they were railing against.

Finally, in May, the students completed a comprehensive questionnaire. It was intended to gauge the efficacy of the programme in meeting the objectives of “knowing”, “being” and “doing”. Without going into a full analysis of their responses, which was a bit like the curate’s egg, I leave you with some refreshing words of approbation:

“I enjoyed attending a class in which my ideas were not deemed dull, even when I was wrong, but corrected. It built the willingness to share knowledge with others and to learn from others.”

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