

Independent Learners or Year 13?

A discussion paper on the first year university learning experience for students in science degrees.

Introduction: The 2008 UniServe meeting at the University of Sydney inspired this discussion paper. While the papers presented at this meeting were important, the discipline discussion forums, informal conversations and the final day “wrap-up” sessions proved essential to uncovering possible solutions to what is clearly an intractable problem (i.e. student engagement and learning at university). For these reasons, this structure should be preserved and encouraged for future UniServe meetings.

The focus of this short paper, which emanated from the above conference environment, is the first-year experience in science degree programmes, and whether first year at university should become a “year 13” of secondary school.

Teaching interventions that work: A noticeable trend through attendance (by the author) at UniServe meetings and the education forum at the 2008 *Genetics Society of Australasia* meeting, was that teaching interventions that significantly increase student performance in examinations, as well as enhance student satisfaction with the experience, are very “hands-on” and resemble a secondary school teaching approach in some way. This may include the marking of rolls to check attendance, the employment of senior students to closely tutor (teach) first-year students, or some other motivating element associated with assessment to essentially force students to engage with the subject, rather than leave it to their own motivation and time-management skills. An example of this is the “PASS (Peer Assisted Study Sessions) Programme” at Flinders University in South Australia (1). An explicit and clear learning structure is introduced, removing responsibility from the students to organise themselves. This may be reasonable for the transition from secondary school to tertiary university education, however, the question must be posed on whether it’s possible to blend such approaches to tertiary education styles required for the development of independent learners by the time of graduation. Is the first year of a science degree too early to expect any development of independent learning capacity in students?

Another trend observed is that while there is an immense amount of interest and research in developing teaching interventions, both on-line and off-line (see UniServe 2008 bibliography and Conference Proceedings), these do not necessarily lead to improved

academic performance by students (as measured by examination and other assessment). An example includes the 2006 study of genetics students by Zhang and Lidbury (2). This study showed that only *Distinction* level students benefited from the teaching interventions employed, but not the less able students who still did not engage with study in spite of novel learning experiences (although the reported experience of this approach was very positive). This raises the issue of focus on the provision of guidance on “learning to learn” for students. This also implies that while the most able students will embrace new ideas and learning styles, the less able students need clear guidance, and in some cases may need to be forced to engage with the subject and the teaching interventions introduced.

In considering the above, a question on how students apply skills and knowledge across discipline boundaries may be relevant. Rather than “forcing” students to engage, may be a focus on cross discipline skill/knowledge application will be useful. This matter has not attracted sufficient attention, but may help build confidence during first-year university, and contribute to producing independent learners.

First-year science students; Extension of senior high school, or a traditional tertiary education expectation? : This is essentially the question at the heart of this paper. There is a perceived lack of preparation for university study from the senior high school system, hence the view by some that we need to compensate for this at university level. In this conversation the concept of secondary versus tertiary education is often lost. By its very nature and purpose, university is a higher level of education (i.e. the “tertiary” phase), and therefore, should leave the secondary level behind. A critical component of tertiary education is to become an “independent learner”. However, it may be unreasonable to expect that this skill be acquired immediately on exposure to the university experience. Integrated into this question of tertiary level education and learning independence is the question of what did students learn while at high school? There is little doubt that the HSC and equivalent final secondary school examinations are rigorous, so by extension, we can confidently assume that students know something when they arrive at university. An insight from the 2008 UniServe meeting was the problem that high school only teaches them to apply their knowledge within strict subject boundaries, and that a problem on entry to university is the requirement to apply skills and knowledge across subject boundaries (e.g. mathematical equations in chemistry). Also, for entry into university level science degrees, many departments state the “assumed knowledge” requirements from high school, but with an adequate UAI score, the student can still enter the

degree without any prior knowledge of science or maths. This issue was also raised during UniServe discussions, and it was suggested that through lobbying the Deans of Science, high school science and maths must be made compulsory, uniformly across the country, for Australian science degrees. In the meantime, the answer to the question of student success in the first year transition to university may not be the *carte blanche* revision of what should have been learnt at school, but guidance on how to apply skills broadly and outside of the typical context. It may also be useful to explain to students the differences between lectures and tutorials, and how learning is conducted and encouraged at university, as well as define in first year how an independent learner operates.

Lecturers: Are we academics or teachers? : There appears to be a tension today regarding how academics are defined. We often hear language associated with High School (secondary education) used at universities nowadays, for example, “teacher”, “class”, and uni being called “school”. This may seem innocuous, but does point to a change in the perception of universities, academics and their function. The question is how far do we move towards secondary school style “teacher” function, from the traditional role of a university academic, who by their nature are employed by universities based on their research expertise? At the level of tertiary education, students are meant to be independent and self-directed learners from day 1 on campus, and their learning experience comes from contact with experts who generate the knowledge, not teachers in the traditional sense as found at primary and secondary education levels.

The challenge, therefore, is to create a less remote and less transmissive teaching style through embracing proactive teaching methods, but retain the essence of the true meaning of a tertiary education through exposure of students to university scholars. An awareness of the cross-discipline and contextual issues raised above, may be a way to meet this challenge through encouraging independent learning sooner (i.e. as a tertiary education skill).

Conclusion and Recommendations: Essentially, this paper suggests that the first-year university experience be transformed to combine elements of “year 13” (i.e. re-teach them in a secondary school style, what they should already know from high school) and a “traditional” university experience (i.e. the students find and build their own resources and work it out themselves). However, this year 13 aspect must be focussed on the translation of

knowledge, skills and learning across disciplines and other areas of study that may not initially appear to students as linked (e.g. apply mathematical skills to chemistry).

The other recommendation is that UniServe, as a national forum in the discussion of science education at university, now evolve towards a position of influence throughout the higher education sector. On several occasions through the 2008 meeting, the idea of individual academics at individual universities lobbying their Dean was raised, as a way to bring ideas generated by UniServe to attention nationally via Deans of Science meetings. This may be more effective and efficient if it comes via UniServe, and the Dean of Science from the University of Sydney be the first Dean contacted on such matters.

References:

- (1) Burke da Silva, K., Wood, D. and Menz, I. (2007). *The development of models of teaching focused on engagement and retention in large first year science courses.*
<http://science.uniserve.edu.au/pubs/procs/2007/>
- (2) Zhang F., and Lidbury B.A. (2006). *It's all foreign to me: Learning through the language of genetics and molecular biology.*
<http://science.uniserve.edu.au/pubs/procs/2006/index.html>

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