

Introduction

Anyone who has instructed both mature age students and recent high school graduates can attest to the significant difference in their learning styles, McKenzie and Gow, (2004), (Martin, Wilson, Liem and Ginns (2013). Mature age students are often more motivated, more organized and focused, and achieve better learning outcomes. Recent high school graduates often see university as an extension of high school where the aim is to pass exams (often only just pass) and to obtain a piece of paper (a degree). This poor motivation leads to surface learning and poor skills which make students unappealing to employers.

From our experience the mature age students we value, and the motivated high school graduates, are all motivated in choosing their course of study and this carries them through the difficulties to eventually succeed. Once students are motivated they can then be shown the methods which will make their learning efficient and shown goals and sub-goals to get them to their desired destination. Armed with both motivation and good learning methods most students succeed and become professionals of which a University can be proud.

The conventional wisdom is that educators simply need to wait until students mature and become more motivated, can appreciate the university subjects, and eventually achieve better learning outcomes and a more professional mindset. This paper argues that the maturation process can be aided and guided in very simple and concrete ways. There is also an equity issue in that not all students come from a background that sets them up to be motivated at the start of their university career and as such we have an obligation to help all these students benefit from better motivation.

This paper describes activities in a first year course that are specifically aimed at improving student learning outcomes by igniting student motivation. We have chosen the issue of employability as a key motivator, a topic which is also a key strategic goal of all universities. By making this longer term issue immediately relevant, students also better understand the context of their studies.

Literature Review

The issue of employability for engineering students has been well studied. Work from Nair, Patil and Mertova (2009) based in Melbourne, looked at the gap between what employers want in the way of graduate attributes, and the attributes actually observed by these same employers. On a scale of 5 employers rate the importance on oral skills as 4.87 but the satisfaction with graduates at 3.92, for written skills the figures were 4.38 and 3.83, for interpersonal skills 4.56 and 3.99. Clearly students are under-rating and/or under valuing these key skills. Other authors such Smith and Jollands (2014) based at RMIT also in Melbourne come to a similar conclusion. The work from Abdulwahed, Balid, Hasna and Pokharel (2013) examined the employability topics most mentioned in the literature and the results broadly match the previous authors. The student evaluation of these same graduate attributes is at variance with the employer view as shown by Itani and Srour (2013) with the topic of communications skills and teamwork rated very highly by employers and rather less importantly by students. Even if graduates do become aware of what employers want they must also be able to articulate and have evidence of their employability attributes in order to be successful as shown by Knight and Yorke (2003).

Another important aspect of employability is the likelihood of not being employed. If every student gets a job then the motivation to excel can be low. A variety of graduate destination

surveys have shown that there is a significant chance of an engineering graduate not being employed. The Australian university backed Graduatecareers.com.au (2015) reports unemployment rates of nearly 40% in some branches of engineering. Most students have little knowledge of these low employment rates.

The gap between the student and employer vision of graduate attributes, and the possibility of not getting a job, provides an opportunity to motivate students.

Motivation viewed through the lens of self-determination theory can be intrinsic, extrinsic, positive or negative and a successful strategy will incorporate all these aspects as found by Gagné and Deci (2005). These authors point out the value of interrelatedness in fostering the internalization of autonomous motivation and work outcomes, and that interrelatedness such as teamwork is also a key of attribute employers want to see in new graduates.

While we focused on student motivation in this paper, it should also be pointed out that instructor's performance and institutional support influence student motivation. In their study, Afzal, Ali, Khan, and Hamid (2010) found instructor's performance had an effect between 23 to 34 percent depending on extrinsic or intrinsic motivation. Institutional support in the form of supportive policies is also important as found by Levy and Campbell (2008).

LEVERAGING STUDENT INTEREST

As stated earlier student motivation is the key to improving learning and our project started by brainstormed a range of ideas about motivation. Some of these were positive as in "you get this" and some were negative such as "this is a danger to avoid". Given the literature we felt that employment was the best umbrella idea, and also a key university strategic goal. The key motivational levers on student thus became-

- At the end of your course you could be attractive to employers. As a result you will have a career, an interesting job that pays well and with updating lasts you until retirement.
- At the end of your course you might be unattractive to employers. You may not find a job in engineering, and have a large education debt. Not all graduates get a job.

These two points above were put to first year students in the first lecture of semester in an interactive lecture, and clearly provoked interest. Students were then asked a simple question; "*what would make you attractive to employers?*" In the ensuing discussion we found, as in the literature, that most students focused on technical skills and marks. Students were asked to think about the issue and that there would be more discussion in the next lecture.

The focus on marks is a common shortcoming in students' vision and expectations. From the experiences of others, Nair, Patil & Mertova (2009), and our own extensive interviews with employers as part of an RMIT Global Learning by Design education grant, we know that most engineering applications are vetted by the following process-

- A grade point average over a certain limit is required, this is typically 65% to 80% depending on the job. Interestingly no employer we spoke to regarded 50% as a "pass" for their job applicants, some actually laughed at the idea.

- Evidence of soft skills was required (team work, written and oral communication, “can do” attitude, enthusiasm, motivation ...). The CV and cover letter were examined for evidence not just claims.
- Ability to follow the job advertisement instructions was part of the selection process.
- If the above points are satisfactory then the job applicant may progress to a phone or face-to-face interview.

It was interesting to note that employers generally assumed technical skills as a given baseline. Technical skills as such were not considered a serious point of differentiation by most employers.

In the third lecture of semester we presented the job selection criteria above. Many students were surprised to learn that marks alone are not adequate from an employer point of view.

In order to convey this reality to students more forcefully than “just another interesting lecture point”. We interviewed four current industry employers who had the experience and authority to say: “*we choose graduates like you and this is what we want*”. From these interviews we created two video clips of approximately 8 minutes each and showed these to students in the fourth lecture of semester and then discussed the videos in an interactive manner. The videos are available on YouTube and can be used and viewed by anyone, see Soft Skills Film 1 (2015) and Soft Skill Film 2 (2015). A point which was strongly made to students was that their time at university should focus on identifying what employers want, gaining those things, and recording evidence of those activities. Not all these desirable activities are within the scope of a university education. For example; part time work, team sports, and community leadership can provide substantial evidence of the soft skills highly desired by employers.

By week four of semester we felt that the vast bulk of the student body was now sensitized and interested in what employers wanted, concerned about their employability, and so the next stage of the video job application assignment would be well accepted.

JOB VIDEO ASSIGNMENT

While raising awareness of what employers want is very valuable, for maximum motivational improvement students need an assignment to consolidate and extend their understanding. The assignment we chose was similar to a newer method being used by employers to vet job applicants; ask the applicant to make a short video of themselves as they answer the job application questions. A student can easily make such a video using a mobile phone plus freely available video editing software.

The design of any educational activity is very important and several issues needed to be considered. When we chose the ‘Job application video’ as our assignment we considered the following issues:

The first was the scope to plagiarize which is a well-known cause of students failing to learn. Given that the students had to appear personally in the video plagiarism was felt to be a low risk.

The next issue was the source of the job advert, should we provide one or more example adverts that explicitly mentioned soft skills? Or: Should we allow students to search the web for jobs of interest? Should the advert be for a job a first year student could undertake, or should it be a job for a graduate? On balance we thought that getting students to find a graduate advert would be better as we could then ask students to look at their degree program structure and work out where they would become technically competent.

Additionally students would have to trawl the web job sites to find an advert which explicitly mentioned soft skills.

Finally we needed a clear structure so tutors could easily apply a marking rubric. To quote from the assignment given to students, the instructions were:

The structure of your video must be as follows-

- 3 seconds student card: a close up of your student card so your photo and student number are clearly visible.
- 3 seconds title page: a simple screen with this course's title and course code, the assignment title, your name and student number. Clearly indicate if you are willing for this video to be shown to other students.
(Please say yes if you can, if you change your mind later we will happily remove the video.)
- < 15 seconds introduction: introduce yourself, and state which company you are applying to, and which job you are applying for.
- 1-2 minutes technical criteria: imagine yourself at the end of final year having done the courses you select from the program map. Show how you satisfy the technical criteria by talking about what you learned in these courses you read about in the course guides for your program.
- 1-2 minutes on soft skills: again imagine yourself at the end of final year and talk about the soft skills you have mastered. These may be within courses or outside activities such as being employed in a supermarket.
- Last 30 -60 seconds on reflection: clearly state "End of Job Application, Start of Reflection".
- Given your current state of skills and knowledge, state the key areas (technical skills and soft skills) where you need to improve in order to get the job. It may be useful to refer to key courses or other activities where you may get these skills.
- Last thing: you must state on a scale of 1-5 how much you have learned from this assignment. Read out the question and one of the lines below, including the number-

QUESTION: how much did I learn about being work ready (including soft skills) in the process of completing this assignment-

5=There were several important issues I had not understood previously.

4=There were a few important issues I had not understood previously.

3=I knew all the issues but I learned more about them.

2=The assignment reinforced my existing knowledge about these issues.

1= I learned nothing in doing this assignment.

RESULTS AND CONCLUSIONS

This activity is a work in progress but already the results are positive. Student discussion has shown wide interest and students are already showing us and each other what they have done. This social interest aspect itself has a positive effect in consolidating the assignment, Knippenberg and Schie (2000), Wall, Kemp, Jackson and Clegg (1986).

From the perspective of a lecturer the two key factors which boosted student motivation were:

- 1) the concept that “not all graduates get a job” and
- 2) the opinions of local employers who had the power to say “*I choose graduates and if you do not have these skills I will not choose you*”.

The student evaluation in the video assignment itself, and the anonymous surveys at the end of semester will tell us much more and give some measurements from a student perspective. Feedback will also tell us where to improve our motivation enhancement method.

The impost into lecture time was relatively small, for the first four lectures some 15 minutes was taken in presenting the issue and discussion. The video assignment might be one of four or five given in a course. Many courses can be easily modified to accept these small additions.

Most importantly we feel that we have broken the old mold of simply waiting for students to mature. We are adding value to the education process and helping all students, regardless of background, to fast track their way into becoming more motivated and employable.

References

- Abdulwahed, M., Balid, W., Hasna, M., & Pokharel, S. (2013). Skills of engineers in knowledge based economies: A comprehensive literature review, and model development. *Proceedings Of 2013 IEEE International Conference On Teaching, Assessment And Learning For Engineering (TALE)*. doi:10.1109/tale.2013.6654540
- Afzal, H., Ali, I., Khan, M., & Hamid, K. (2010). A Study of University Students' Motivation and Its Relationship with Their Academic Performance. *IJBM International Journal of Business and Management*, Vol. 5(No. 4; April 2010). Retrieved August 20, 2015, from <http://www.ccsenet.org/journal/index.php/ijbm/article/viewFile/5691/4612>
- Gagné, M., & Deci, E. L. (2005). Self-determination theory and work motivation. *Journal of Organizational behavior*, 26(4), 331-362.
- Graduatecareers.com.au,. (2015). *Graduate Careers Australia | Providing information to Australian graduates for over forty years*. Retrieved 16 August 2015, from <http://www.graduatecareers.com.au/>
- Itani, M., & Srour, I. (2013). Engineering Students' Perceptions of Soft Skills, Industry Expectations, and Career Aspirations. *J. Prof. Issues Eng. Educ. Pract.*, 04015005. doi:10.1061/(asce)ei.1943-5541.0000247
- Knight, P., & Yorke, M. (2003). *Assessment, learning and employability*. Maidenhead: Society for Research into Higher Education & Open University Press.
- Knippenberg, D., & Schie, E. (2000). Foci and correlates of organizational identification. *Journal of occupational and organizational psychology*, 73(2), 137-147.
- Levy, S., & Campbell, H. (2008). Student motivation: premise, effective practice and policy. *Australian Journal of Teacher Education*, 33(5), 2.

Martin, A., Wilson, R., Liem, G., & Ginns, P. (2013). Academic Momentum at University/College: Exploring the Roles of Prior Learning, Life Experience, and Ongoing Performance in Academic Achievement Across Time. *The Journal Of Higher Education*, 84(5), 640-674. doi:10.1353/jhe.2013.0029

McKenzie, K., & Gow, K. (2004). Exploring the first year academic achievement of school leavers and mature-age students through structural equation modelling. *Learning And Individual Differences*, 14(2), 107-123. doi:10.1016/j.lindif.2003.10.002

Nair, C., Patil, A., & Mertova, P. (2009). Re-engineering graduate skills – a case study. *European Journal Of Engineering Education*, 34(2), 131-139. doi:10.1080/03043790902829281.

Smith, J., & Jollands, M. (2014) Employability of engineers relative to other graduates, *Proceedings of the 25th Annual Conference of the Australasian Association for Engineering Education (AAEE 2014)*

Soft Skills Film 1, (2015). *Soft Skills Film 1 V4*. Retrieved 15 August 2015, from <http://youtu.be/upQKtmFI79g>

Soft Skills Film 2, (2015). *Soft Skills Film 2 V5*. Retrieved 16 August 2015, from <http://youtu.be/4Rrb2hbTfY4>

Wall, T. D., Kemp, N. J., Jackson, P. R., & Clegg, C. W. (1986). Outcomes of autonomous workgroups: A long-term field experiment. *Academy of Management journal*, 29(2), 280-304.

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