

Engaging twenty-first century learners

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Abstract – The gulf between the educational methods in UK secondary and tertiary education has never been wider. Students are increasingly driven by marks and the expectation is of ‘teaching’ not ‘learning’. Even a mild spell of disengagement can quickly lead to a request for transfer. Respected sources agree that twenty-first century students demand more than ever before: they expect courses to be entertaining as well as instructive and allow plenty of time for social interaction and revelry. This paper describes, in the form of a case study, how rising wastage rates prompted a university department to tackle the real difficulties of school leavers while adapting to a demanding degree programme. Lecturers were initially keen to blame the problem on lethargic students but began to accept the need for appropriate training. A pilot four-week transition programme, aimed at an intake of over one hundred and designed to improve study competences is described. The programme uses active learning demonstrations and concluded with a highly successful poster competition. A third party student focus group subsequently examined the course’s impact and confirmed that the need is real. The verbatim responses reveal some of the perceptions and concerns of new students and have led the way to further enhancement in the future.

Index Terms – Engagement, transition to university, learning to learn

INTRODUCTION

Many who are currently teaching at university fancifully recall the days when they themselves were students, when lecturers would introduce a topic, students would copy large quantities of notes from the blackboard and students would work through examples whilst diligently reading around the subject. The reward for this diligence came in the form of success in a string of three hour examinations and failure or non-completion would infer a sort of shame that could not be contemplated. Whether accurate or not, this rose-tinted vision of the ‘good old days’ is an expectation of many lecturers and it appears not to fit well with the reality that is today’s typical student.

It is clear that twenty-first century students demand much more: they expect courses to be fun to take part in whilst allowing plenty of time for social interaction and revelry. This was probably always the case but students

appear increasingly driven by marks and reading appears to be a dying art. The expectation is of ‘teaching’ rather than ‘learning’ and sadly, even a mild spell of disengagement can quickly lead to an unwelcome request for a course transfer or withdrawal.

Research into the experiences of new university students is concentrated mainly to the study of students dropping out from courses. Shobrook [1] provided an extensive summary of the reasons for withdrawal from engineering programmes. The list was a long one but focused largely on the fact that student’s pre-perceptions of engineering and engineering studies were not matched by the reality. She pointed out that most entered university having studied maths and physics but had little real knowledge of what engineering is. Several case studies from engineering departments are presented describing various games and activities that describe the world of engineering during induction and attempt overcome some inaccurate pre-perceptions.

Ozga and Sukhnandan [2] developed a model of non-completion using qualitative data from studies of UK institutions. They criticised many earlier attempts at explanatory models for focusing too much on the student; effectively seeking faults in the students’ behaviour to explain their withdrawal. They argued that blame for the non-completion should be shared equally between the student and the institution. They went on to describe the inaccurate prior perceptions of students entering higher education and their stereotypical assumptions of an exciting social life and moderate academic demands.

Since the introduction of ‘curriculum 2000’ in UK schools, which revised the predominant UK university entrance qualification; the two-year GCE ‘A’ (Advanced) level into a succession of six sequential modules, students describe how they gather marks from a collection of short term intensive assignments within the modules and the marks are all important to them. To achieve the best mark, students become very good at following instructions to the letter but there is no time given to any learning outside that directly associated with the instructions. Their teachers, who are very conscious of school league tables, naturally do little to discourage the mark culture and its knock-on effects. Furthermore, contemporary students arrive at university with the widespread belief that “the first year doesn’t matter” which is the apparently logical conclusion they draw because few UK universities carry first year marks into the final degree classification. This attitude has a particularly damaging effect on students studying vocational disciplines

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like engineering that need to convey large quantities of basic science and develop tool subjects like mathematics as the building blocks upon which the degree is built. Failure to understand the basics inevitably leads to problems later.

Cook and Leckey [3] surveyed first year student opinion and found that students generally expected that the learning experience would not differ greatly from experiences in secondary school, after all, why should they think otherwise? Freshers showed a preference for a teaching style that appears to promote surface learning.

INDUCTION PROGRAMMES

Research examining induction practices highlights the first semester as a critical period for students, when the majority are making the transition from the more rigid and formal teaching to higher education's demand for learner autonomy. It is also known that 'A' level study habits can persist well into the first year [5].

Most UK university departments offer a generic induction programme to new students. In Australia and the USA these programmes are more usually described as 'orientation'. Induction programmes vary in content and length but serve to introduce the new student to the institution, the department or organisational unit, the course of study and the staff involved. Topics, frequently covered are pastoral care, safety, introduction to IT facilities, knowledge of university systems, rules and regulations but there is a limit to how much information can be conveyed and retained in the first week(s). Most degree programmes also include some credit bearing academic skills-development such as writing, communication, library skills and personal development planning but, in the UK at least, these are most commonly delivered separately from the formal induction programme. The STAR (Student Transition and Retention) project [5] reviewed UK university induction programmes and said that they should also be a bridge between the educational practices and lifestyles formerly experienced and those considered as desirable in the context of higher education but there is little evidence that this is being effectively achieved. The project acknowledged the need to wean students off staff-dependent study skills and suggested curriculum development teams should look carefully at how and when reflective practice and self-evaluation are promoted.

Custom and practice at Loughborough University and a number of other institutions has been to offer very professional, centrally provided short workshops and to make advice sheets and/or counselling available to students on a wide variety of topics including the whole range of study skills, dealing with stress, fitness and nutrition or rapid reading. The workshops are offered to students as extra curricular optional learning and spaces are limited. They are popular but seldom oversubscribed. A case study from Teesside University described in the PROGRESS guide [1] verifies that, while optional workshops can be effective, attendance diminishes rapidly and those that do attend are generally the most enthusiastic and not the ones who need help. We can only surmise that the same enthusiastic group take the trouble to read the excellent study skills advice

sheets provided by the institution but the less motivated probably don't so this method also fails to provide much of the help that is needed.

LEARNING TO LEARN

The School of Mechanical and Manufacturing Engineering at Loughborough decided to tackle the problem because of rising wastage rates.

Chickering and Gamson [6] offered some good advice about active learning. "Learning is not a spectator sport. Students do not learn much just sitting in classes listening to teachers, memorizing pre-packaged assignments and spitting out answers. They must talk about what they are learning, write about it, relate it to past experiences, and apply it to their daily lives. They must make what they learn part of themselves". Our initial approach to the problem of early withdrawal was to reinforce the pastoral role of the personal tutor with more frequent meetings during the first year. During these informal discussions it was becoming noticeable that an ever increasing percentage of the intake were effectively 'spectating' in the first semester. Attendance at lectures was reasonable and coursework was generally submitted but tutorial sheets remained incomplete, text books remained largely unopened and lecture notes were filed away unread by a sizeable proportion of freshers, presumably only to make an appearance a few days before the examination. Quite apart from the inevitable poor performance, the lack of active learning has a negative effect on motivation and students who begin to get behind and rapidly fall into a cycle of unhappy disengagement in the belief they can never catch up. It was becoming clear that a significant group of students didn't know what was really expected of them or, put more succinctly, they didn't know 'how to learn'.

Staff were initially keen to blame the problem on lethargy but began to accept that entrenched modern attitudes and work-practices needed to be altered over time and by providing appropriate training. These young people had, for example, never been told what to do with a tutorial sheet or why it had been given out. There were, after all, no marks directly attached to completing it and, unlike in school, nobody would chase them to see that the sheets were completed. In any case, a worked solution would very likely be provided in a week or two, so you could just copy it down! Following this line of argument, it doesn't take much imagination to suppose that if one had attended the lecture where the topic was 'taught' that you had completed your side of the bargain. Clearly these students were missing the entire point that formative learning is consolidated by solving problems and that only by doing so would they be properly equipped to pass a summative exam at the end of the year.

PILOT PROGRAMME

A pilot programme known as 'learning@uni' was delivered to an intake of one-hundred and thirty mechanical engineering students over a four-week period for the first time in 2006/7. The short course was designed to improve study competences and address the gulf in attitude to

learning that exists between staff and students. The existing provision, described above, consisting of a short induction programme and optional workshops remained in place and there are existing credit bearing elements within semester 1 modules that cover library and communication skills. The programme, which bore no academic credit was aimed at the whole intake using a combination of lectures and active learning demonstrations and concluded with a highly successful poster competition.

We were very conscious of the potential for students to absent themselves and this problem has been referred to above. In the event, however, attendance at the sessions was good at almost 90% and certainly no worse than for other module classes around that time. The course ran in short sessions over the first four weeks of term: we strongly suspect that attendance might have been dramatically worse if it were offered later. Participation in the poster competition was optional and without a mark driver, just a small cash prize was offered as an incentive. Although a few teams opted out, we received submissions from over 70% of students. There is no way of knowing if those who missed elements of the course would have been the main beneficiaries of study skills instruction, nevertheless it seems likely.

The pilot programme focussed exclusively on learning skills: the relationship between learning and teaching, how people learn, long and short term learning and what people need to learn for a career in the profession. It consisted of four elements; two lectures, one small group workshop encompassing a number of participative activities and the poster competition. We planned to assess the impact of this 'light touch' introduction and only consider future additions or extensions if it was thought to be successful, in the knowledge that the stereotypical engineering student tends to regard non-numerical, 'soft' subjects as peripheral and unimportant and would soon get distracted. learning@uni relied on the enthusiasm of the two staff members who delivered it and this proved a big factor in maintaining the students' interest.

The first lecture offered advice on how to make the most of the various styles of teaching they would encounter on course and demonstrated the difference between teaching and learning. By way of adding impact we also demonstrated the consequences of failing to learn the material and highlighted the various support mechanisms that were already in place.

The second lecture concentrated on the mechanism of learning. Kolb [7] argues that the learning cycle can begin at any one of the four points shown in figure 1 and that it should really be approached as a continuous spiral. However, it is suggested that the learning process often begins with a person carrying out a particular action and then seeing the effect of the action in this situation. Following this, the second step is to understand these effects in the particular instance so that if the same action was taken in the same circumstances it would be possible to anticipate what would follow from the action. In this pattern the third step would be to understand the general principle under which the particular instance falls.

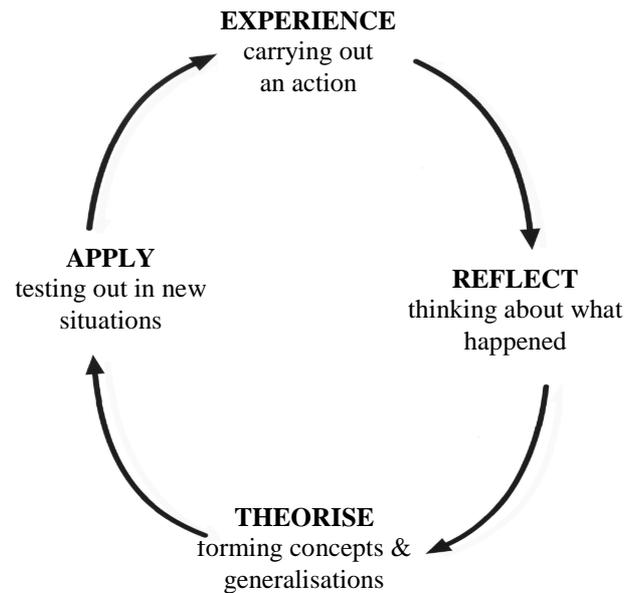


FIGURE 1
THE LEARNING CYCLE: SOURCE, BASED ON KOLB [7].

The workshop was the largest departure from our normal diet of technical subjects and required the most innovation. We adapted training materials from Honey and Mumford [8] and Goodman [9] into a 2-hour activity-based session that was intended to be both instructive and fun. The session was repeated six times with manageably small groups.

Postulating that students would make better use of their time if they understood both the range of learning strategies and which strategy they would best respond to, we studied learning styles and established that each student had their own predominant style of learning. The students were then able to categorise themselves into one of four learner types: activists, reflectors, theorists or pragmatists and hence determine which of the various methods of learning on offer they would most readily respond to. An activist, for example would be expected to respond well to experiential learning and role-play, whereas a reflector would not. A theorist would learn well from lectures and study groups whereas a pragmatist would learn best from laboratory work or case studies. A brief analysis which learning style each student had selected as their dominant style gives an interesting result. The most common type (45%) was 'reflector' and the least common was 'activist' (13%) with the others somewhere in between. Accordingly [8], the largest group actually believe they learn best from self-managed learning, coaching or research and reading.

On the principle that students might better understand their lecturers if they were able to appreciate some of the difficulties associated with conveying lecture material, the students were invited to teach a 'mini-lesson'. They were given a range of simple props and divided into teams. Each team selected a simple topic from a list and prepared to explain their subject to the rest of the group. Afterwards the audience discussed the effectiveness of the 'lesson'. The feedback was both enthusiastic and informative.

Having earlier studied learning styles and discussed the range of different teaching methods available in universities (lectures, case studies, laboratories, videos, CAL, group discussion etc.) the teams' presentations were perhaps a little surprising. Almost without exception the teams presented a mini-lecture whereas many had agreed earlier that lectures were often not a very effective way of aiding understanding. Perhaps falling into lecture style delivery was the easy way out of a problem; sort of comfort zone that is all too easy to fall into even though it is not always the most efficient. A salutary lesson here for lecturers, perhaps?

The formal sessions concentrated on how we learn but students commonly express the view that some of the science they are taught is pointless and appears without application, so we also sought a fun way to address this misconception. We posed the simple question "What does a Mechanical Engineer need to know"? and asked teams to consider and research this amongst themselves and report their findings to their personal tutors, at the same time presenting a poster that they designed. The best two posters won a small prize.



FIGURE 2
POSTER COMPETITION WINNERS

Some teams put a lot of effort into their poster and tutors reported that it had prompted a very useful and engaging discussion about mechanical engineering. A few teams opted out completely but most made a fair effort. While it was clear that most who participated enjoyed the events, it was less clear whether our objectives had been met.

FOCUS GROUP FEEDBACK

Approximately one month after the final learning@uni activity, a focus group was held in the Centre of Excellence for Teaching and Learning: a department on campus but separate from the School of Mechanical and Manufacturing Engineering. Staff of the School were deliberately not involved. A small but representative sample of student volunteers who had participated in the programme were recruited and interviewed in a relaxed environment. The intention was to probe students' perceptions of learning at school and university and their experiences of making the transition between the two. It was also intended to query the

different elements of the learning@uni programme and their effect on student attitude, motivation and behaviour with regards to any modifications in their approach to learning. While the sample is not large enough to offer concrete evidence of group behaviour, every effort was made to solicit honest and unbiased opinions to inform the development of the programme.

To address the possible concern that it may only be the most highly motivated students that chose to participate in the focus group, all were asked to complete an anonymous form identifying such factors as their educational background and whether they thought that they worked as hard, harder or less hard than the majority of other students on their course. The focus group consisted of six students who quite accurately represented the gender and prior learning balance of the whole intake. There were five male and one female students. All except one were UK home students. Their responses also confirmed that it was not just the most hard working students who had chosen to take part: the reason for this was probably because we had agreed to pay a small cash incentive to encourage participation. The discussions were tape-recorded with the students' permission.

The focus group revealed that the students encountered widely varying degrees of difficulty in making the transition between learning at school and learning at university, with some taking it in their stride and others find adjusting more of a problem. "It's a bit difficult with the transition because, before you just had to do what they (teachers) told you to do and that's all you had to do. Now you have to do what they (lecturers) tell you to do and also do some background reading because there's something they didn't tell you or you can't do the question because you haven't learned something else. If you just go and sit in the lecture and fall asleep, like quite a lot of people do, or just don't turn up at all, then you've got a real problem. I fall behind if I miss just one lecture." Asked to contrast the different learning environments, they listed:

School:

- Lessons
- Focus on passing exams
- Homework
- Time with the teacher

University:

- Self learning
- Life long learning
- Lectures & tutorials
- Distance from lecturer

The feedback suggested that an appreciation of the implications of the different approach to learning does not materialise immediately. Instead, they report that appreciation begins to emerge when students realise that the lectures alone are insufficient to undertake the coursework properly. "I think I first noticed when you start thinking; 'hang on, this question doesn't make sense to me'. In the lectures you only have a short period of time and they (lecturers) can't go through as complex a question as they might have to set, so you sit there and think, 'I'm not sure I'm getting this', so you have to go away and read the book. Then you realise that the reason you have to read the book is because he doesn't have enough time to teach you everything you need to know in the lecture. You can't define a time when you notice, but you sort of notice it gradually. It's a

different time in each subject because different lecturers lecture differently and so on. I think that probably when I first noticed is when I couldn't do the tutorial questions. Then you realise you've bought a book and, maybe you should read it".

Following learning@uni, the sampled students were able to demonstrate an understanding of the different ways in which they were expected to learn. The students confided that learning before university was characterised by "spoon fed exam-learning" with "not much opportunity for originality" whereas they had realised there was an emphasis on "self-centred learning" at university. "With a degree it's so much like you're actually learning it rather than just for an exam. 'A' levels felt like 'you only need to know this for the exam', and we did so much pointless stuff. It was only really to, in my opinion, to pass what was on the paper. Here (at university) it actually feels like you're doing it"... "Yeah, you're learning it because you're going to use it for the rest of your life".

The focus group was asked what they felt were the most important ideas from the learning@uni lectures. Although the lectures occurred 6 or 7 weeks before the focus group, the students were able to recall what they felt the most important ideas were. They identified a mix of elements but the single most prominent idea was the need to undertake independent study in addition to attending lectures.

When asked about the group workshop activity, the students reported the following key themes:

- "That different people learn in different ways".
- "That I should try and become a more rounded learner".
- "Finding out about my own learning style and how I learn best".

Comparing the students' responses with the original intended learning outcomes suggests that both the lectures and the workshops were in some ways effective in helping the students to realise the difference between learning at school and university; that it is not sufficient to merely attend lectures; and different people respond best to different methods of learning and teaching according to their in-built dominant learning style.

The focus group was asked whether the learning@uni sessions had affected their attitude, motivation or behaviour. There were no negative responses and the following quotation was encouraging. "It helped me particularly because I've always known that I don't really like being lectured at, but through the group activity I have learned a lot more about what my learning style prefers. I've learned that I'm much more practical than I ever thought I was and I like worked examples, but I like to do the questions rather than to be sat there being told about it. That was important to me, as it's not something I'd discovered before". Another student offered. "I do still go to the lectures but I try to get more involved and I take a lot more notes than I used to because that will cement things for me, as opposed to just sitting there listening".

Furthermore, the mini-lesson activity also had impact. "It showed me that it's actually quite hard to give a lecture, because you've got to make it fun. In the football thing,

immediately we went into explaining the rules and drawing pictures and so on, and at the end of it they said we gave a lecture, and that was the last thing we wanted to do as most of the time we think that lectures aren't particularly effective. I think that's given us a bit more respect for our lecturers as a result." All students claimed that the course had affected their approach to studying in some way. It was no surprise that the active learning workshop proved the most popular component of the course. Charts 1 and 2 illustrate these findings.

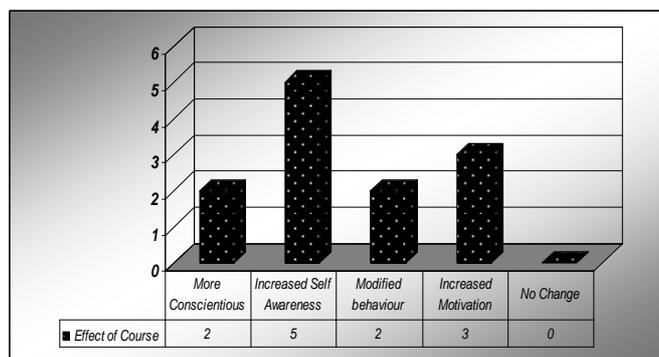


CHART 1:
PERCEIVED OUTCOMES OF LEARNING@UNI

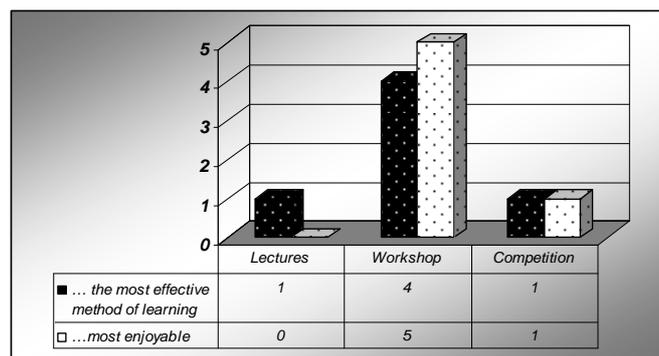


CHART 2:
PERCEIVED MOST USEFUL COURSE COMPONENTS

Some of the effects had a negative side. "I now feel guilty if I'm not working"... "I'd agree with that, actually. You think "I know I should be working". We wished to convey a work-hard and play-hard ethos.

The focus group offered a number of ways in which the learning@uni course could be enhanced. These included having more sessions and pairing students up with 3rd or 4th year students. "I was talking to someone who's a second year mechanical engineer not so long ago... I think it would be useful to have someone who's done it ... and tell you what happens later on or what's good to do in your spare time"... "Yeah, I agree with that... a lot of them (2nd years) say it seems hard now, but it does all smooth out and it clicks into place and all makes sense and you will pass the exam", but it's a bit daunting now when you've been told your exams are going to be in five months, so you think you've been taught half of what you need to know and none of it's solid yet. It can be a bit frightening. Having that link

to someone who can tell you that it does make sense, it's going to be ok, would be a lot more helpful".

THE WAY FORWARD

A number of researchers have already demonstrated the value of linking incoming students with those already on course in a pastoral role. The use peer buddying, or mentoring as it is sometimes known, has been described by McLaughlin et al [10] through a case study at Sheffield University and there are a number of others who acknowledge its value.

From next academic year we plan to follow this route and have already secured funding through the enthusiasm of our student counselling service to provide professional training and support for volunteer senior students. Through this, it is hoped to engage with more of the presently reluctant participants. Building on the modest success of this year, we plan to add additional learning@uni activities involving peer mentors and at the same time create a valuable extra-curricular personal development opportunity for the volunteers.

Although limited, the focus group provided evidence there is a real need to assist students in adapting to learning at university. It also suggests that the learning@uni programme made a simple but valuable contribution to the transition period consuming only limited staff resource. We can only assume that students who are more aware of the issues will become better engaged with the programme and less likely to withdraw or fail as that remains to be seen.

An institution is presented with a window of opportunity for establishing a positive working relationship with its students during their first year, but that window is relatively narrow and it seems that one has to be quite innovative to maximise the effects.

CONCLUSIONS

While not all students experience difficulty with adapting, the number of students who find the transition from school to university fraught with problems is increasing in the UK. In particular, the study methods and the expectations of staff in tertiary education differ more widely than ever from what most students are accustomed to.

Students are more willing than ever before to withdraw or transfer from a degree programme at the first signs of difficulty and they often to expect to be entertained as well as educated. Only active intervention will combat rising wastage rates.

Using imaginative measures early in the course coupled to an effective pastoral system can ease the transition. Of particular use are instructional 'fun' activities and the emphasis on real applications within theoretical classes. However, only measures addressed at the whole cohort will reach those in most need.

There are strong indications, both from the literature and from the focus groups, that peer-to-peer mentoring would be a useful aid to retention.

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