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Evaluating the effectiveness of a first year module designed to improve student engagement

Peter Willmot and Glynis Perkin

Abstract

A key challenge for universities is to provide motivators beyond those gained by the award of marks. Student engagement is essential for learning - even the best teacher cannot succeed without it. This paper describes the evaluation of an innovative year-long module for mechanical engineering students that embraces competitive challenges, student-centred learning activities, problem solving, creative design and skills workshops that was designed to sit alongside and provide motivators for a broadly traditional first year curriculum. The module was under development for three years and anecdotal evidence suggested that there were positive benefits, thus an independent evaluation, funded by a small grant from the Higher Education Academy, was commissioned. The evaluation used both qualitative and quantitative methods of enquiry and largely confirmed what had been noted anecdotally. Following the evaluation, additional minor changes were made and feedback from the improved module is reported.

Introduction

Despite the obvious attractions that are potentially inherent in exploring the frontiers of technology, engineering education has commonly been tagged as “serious”, “numerical” and “studious” and this can make engineering appear “boring” and “monotonous”. Over-concentration on well meant but potentially insular textbook activities has sometimes led to criticism of students not being able to retain and apply concepts learnt in practical scenarios and graduates with poor employability skills (Roberts, 2002). Furthermore, there can be little excitement and motivation for those students who have a lower capacity for quiet study and who yearn to exercise their own creativity. Kalonji (2005) goes further, suggesting that by sticking to existing models we are losing the battle for young peoples’ imaginations.

The present study poses questions and generates possible solutions to how greater numbers of university students, particularly during their first year, might engage more completely with their studies, while recognising that many students already do so to a very pleasing extent. There appears to be a lack of consensus regarding definition of the term *student engagement* in the academic literature and how different organisations and individuals interpret it (Trowler, 2010). For the purposes of this work *student engagement* is primarily seen as signifying students’ personal engagement with and/or participation in the learning process.

The demands and expectations of students are likely to change in line with increased tuition charges that are the result of UK government changes in the funding of higher education (Government White Paper, 2011). Furthermore, the mindsets of today’s new students are often mismatched with the expectations of their lecturers with respect to the acquisition of knowledge and behaviour (King, 2006). It is well known that effective engineering education requires integration of knowledge with practical skills, and this can only be achieved through implementation and realisation, thus making engineering education, perhaps uniquely, challenging.

The transition to higher education can be problematic and it is widely accepted that ‘effective transition can help to improve rates of initial retention and ongoing success’ (Thomas, 2009). The Higher Education Academy surveyed a large number of students who had withdrawn early from UK universities (Yorke and Longden, 2008) and cited poor quality learning experiences as one of the major reasons. This is defined for us by the students’ own perceptions. Some identified a sense of isolation. For many, this was associated with large-scale lectures that allowed little, if any, interaction with academic staff or fellow students. Some commented on the impersonal

nature, the difference between university and secondary school styles and the presumption that lecturers expected students to adapt instantly to their mode of delivery. Others commented on the lack of opportunities to make friends on their course or intimidating or unapproachable staff. These comments were unsurprisingly negative, given that the survey was of students who had already left their courses. According to Tinto (2006), most institutions have not yet been able to translate what we know about student engagement into forms of action that improve persistence and retention.

It was the realisation that young people arrive at university with very different attitudes and abilities to those of their forebears and that universities need to adapt to their changing needs that drove the movement for change in the Wolfson School at Loughborough University. Generational changes are rooted in shifts in culture and should be viewed as reflections of changes in society. In the past, a much smaller proportion of the population undertook a university education and it follows that many of those who chose engineering did so because of a deep rooted interest in machines and the built environment or a passion to exercise their ingenuity. Today, when the expectation of many is to progress from school to higher education, it seems a much larger number arrive in engineering simply because they are mathematically competent and university study in STEM subjects is the next logical step. Furthermore, dropping out or switching course used to be regarded with distaste, but is now seen as acceptable and commonplace. Shobrook (2004) provided an extensive summary of the reasons for withdrawal from engineering degrees. The list was long but focused largely on the fact that students' pre-perceptions of engineering studies were not matched by the reality. She confirmed that most entered university having studied maths and physics but had little real knowledge of engineering applications.

Anecdotally, lecturers frequently observe students who appear driven by marks alone. Herzberg's two-factor theory (1959) suggests this is a "hygiene factor" rather than a "positive motivator" and, while such needs are essential, they are insufficient for the strong personal growth and fulfilment that comes from having real ownership and involvement in learning. For many years we have observed students

growing in maturity during the course of their degree programmes; from the initial position where "life begins when work ends" to life and work becoming inextricably linked when they become emotionally attached to and motivated by their work. The task, however, is to make this happen earlier and with an updated initial skills set. In *When teaching becomes learning* (2007), Sotto wrote that motivation is already present in learners but it is a matter of creating situations that enable learners to become actively engaged and to use these experiences to reinforce the necessary fundamental knowledge and skills to support the science.

This paper describes the evaluation of an innovative year-long module for mechanical engineering students that embraces the concept of *enquiry based learning* (EBL) and where student-centred project work and skills workshops sit alongside and provide motivators for a broadly traditional first-year curriculum. EBL covers a spectrum of approaches which includes problem based learning, small scale investigations and research based projects (University of Manchester, 2010). The interventions described here are all founded in the widely known constructivist educational theory where learners are invited to construct knowledge for themselves, become actively involved and learn *how* to learn *while* they learn. To echo Lindsay et al. (2008), the purpose was to change the student's mindset into thinking and working more like an engineer. Reported are some of the successes and "growing pains" that have accompanied the experiment over a three year development period.

Instructional design methodology

The evidence from a variety of sources points to the importance of collaborative, student-centred learning and teaching strategies (e.g. Crosling et al., 2008) that facilitate staff/student interaction, enable students to develop academically and staff to have a better understanding of their students. These approaches also promote peer interaction and the development of long-lasting friendships. It is important that the teaching-learning process is smooth, rich and enjoyable for the student; however, this has been a learning experience as much for the staff as for the students.

The new first year module, *Engineering Principles and Professional Skills* (EPPS), is delivered throughout the first academic year

and accounts for 20 UK credits (10 ECTS). The intended learning outcomes specify what the learner should have acquired and accomplished by the end of the module and set the context for each session. The objectives are set at the beginning of each task and ensure that the student continuously moves from lower order thinking to higher order thinking, as per Bloom's taxonomy (revised in 1964). The overall aims of the module are to:

- ease the transition to university
- improve metacognition and develop applicable practical and transferable skills
- develop an integrative approach to studying engineering
- promote problem solving skills through the application of fundamental engineering science.

The new development sits alongside a largely unchanged curriculum and embraces the premise that the most effective learning takes place when students are motivated. The assignments must therefore be enjoyable as well as instructional, must attempt to integrate theoretical work from other modules and aim to generate a positive cooperative spirit between staff and students and within the School as a whole. Most importantly, they must make the students want to become engineers.

According to Malone and Lepper (1987), there are four basic factors needed for intrinsic motivation to occur during a learning activity: challenge, curiosity, control and fantasy (encompassing the emotions and the thinking processes of the learner). These are the features that transform learning into a game and are the basic principles upon which the EPPS module was built.

Module description

The new EPPS module is delivered to approximately 150 first year mechanical

engineering undergraduates. It is based around four student-centred enquiry based learning (EBL) assignments of different styles and duration and a programme of appropriate skills workshops. There is also a one-hour per week lecture programme to provide connectivity and, in some cases, give information. There is no formal examination. The assignments are designed to encourage student engagement and develop group working skills and the major project (in the second semester) attracts industrial sponsorship. Details of the activities are listed in Tables 1 and 2 and full descriptions of the module structure and the major assignments can be found in other publications (Willmot et al., 2007 and 2010).

The module has strong links with the School's personal tutoring scheme. On the cohort's arrival, 24 academic staff are designated as personal tutors and meet with their tutor group of typically six students each week. Personal tutors have traditionally provided pastoral and general academic support, but enthusiasm for the system has historically been patchy and strong bonds were rarely formed between staff and their tutor group or between the tutor group members themselves. By linking the competitive activities in the module to these groups, it was hoped that a stronger sense of ownership and camaraderie between the student groups and their personal tutor would be engendered.

The hands-on *skills workshops*, listed in Table 2, run alongside the student-centred assignments and are timetabled as appropriate across the year with slightly larger groups appropriate to the particular activity. The workshops are integrated into the programme and each one is repeated several times until the whole cohort has taken part.

The object of the teambuilding exercise in week 1 is to assist in turning the groups into

Table 1. Group based assignments

	Duration	Description
EBL1	1 day (8 hours)	Competitive Design and Make using simple materials
EBL2	1 day (8 hours)	Business Start-up Game
EBL3	3 weeks	Vehicle Systems Research Project – create a video documentary
EBL4	13 weeks	Competitive Design and Manufacture project – mechanical handling

Table 2. Skills workshops

Topic	Duration	Description
Teambuilding and Resource Management	2 hours	Practical exercise
Library Skills	2 hours	Practical exercise
Understanding Learning Styles and Study Skills	2 hours	Practical exercise
Plagiarism	1 hour	Practical exercise
Problem Solving	2 hours	Competitive robotics exercise
Basic Workshop Skills	2x2 hours	Hands-on workshop training
Engineering Measurements	2 hours	Practical laboratory

teams. The teams have generally begun to bond and function by week 5 (designated “project week”), at which point lectures and tutorials for all other modules are cancelled. It was decided to introduce this break from didactic delivery in the fifth week of the first semester to encourage and excite students who are still adjusting to university lectures but evidently starting to become unmotivated and inert. EBL1 and EBL2 are intensive, day-long team exercises and, because of the numbers involved and their practical nature, each one runs twice, with half of the cohort taking part each time. Aside from the fixed activities, this week allows freshers (new undergraduates) some time to reflect and, perhaps, catch up on other tutorial work.

Analysis of the effectiveness of change

Methodology

Conventional end-of-module feedback is obtained routinely for all modules in the Wolfson School of Mechanical and Manufacturing Engineering; quantitative data are optically read and free text comments are summarised by the module leaders as a developmental process. Feedback relating to the EPPS module underwent particular scrutiny for the academic years 2008/09 and 2009/10 as part of the evaluation process.

In addition to the evaluation process, students were invited to participate in an online survey on the module in the academic years 2009/10 and 2010/11 in order to discover their opinions about its different elements and to determine their levels of engagement.

Student focus groups were undertaken at the start of the academic year 2010/11, involving second year undergraduates who had completed the EPPS module during the previous year. The outputs from the focus groups provide qualitative data relating to student engagement with the module, perceptions of the module whilst undertaking it and a reflective opinion of its worth from the second year perspective. The focus groups were led by a staff researcher who is independent of the Wolfson School. As might be expected, only the keenest and most engaged students participated. This, however, has been beneficial to the evaluation as these students were regular attendees and were able to comment on all aspects of the module.

Semi-structured interviews were undertaken by the researcher with staff who initiated the first year curriculum changes, staff who were conscripted to help with the module and personal tutors who may have observed a change of attitude in their personal tutees. All participants were guaranteed anonymity.

The rationale behind the focus groups and interviews was to identify any areas of the module where improvements could be made to enhance the learning experience. Subtle changes were made to the module activities during the 2010/11 academic year in response. Following these changes (which were, in the main, to EBL1 and EBL2) additional student feedback was sought.

Finally, module feedback obtained at the end of the 2010/11 academic year was scrutinised by the researcher, with particular attention to free

text comments by the students, in an attempt to identify whether the most recent changes to the module have had a positive effect.

Web-based survey

The online survey was made available for completion by the students midway through the academic years 2009/10 and 2010/11, after the first three EBL exercises but before the start of the major project. The object was to determine perceptions of the learning style and their approach to it. Participation was voluntary and, unlike the generic module feedback, the survey questions were specifically targeted at this module using a mixture of multiple choice and free text questions. In their text comments, most respondents referred only to the EBL3 project, which had been completed the week before the survey was launched. The response rate of the two surveys was considered good at 53% (76 students) and 41% (57 students) respectively. There were a large number of text comments in response to the open-ended questions "What was the best thing about the experience?" and "How would you improve the tasks?" The vast majority indicated that the enquiry-based teamwork approach was very much welcomed, while most suggestions for improvement centred on the provision of better facilities and practical equipment for self study.

A number of specific statements for participants to rate on a 5-point scale were included, with 5.0 indicating ultimate agreement and 1.0 ultimate disagreement.

Figure 1 shows a breakdown summary of pertinent results normalised by percentage of respondents and it can be seen that, not

only were the answers very positive, but also the incremental changes made for the most recent cohort had been well received and effective. In terms of the prime objective (course engagement), it is hard to imagine another substantive coursework assignment that would solicit positive feedback from over 80% of respondents and with similarly positive responses that the EBL tasks had been effective learning tools.

When asked if the EBL should be replaced by a traditional lecture programme, 17% agreed in both surveys. While this number is relatively small, it is clear that the style does not suit everybody. It is unknown whether this is because of differing personal learning traits or the highly visual application that EBL requires. Informal discussions with tutees hint that a traditional course is seen by some as requiring less direct effort, however this may not be the underlying reason. It is possible that this may be a feature of the cultural diversity of the cohort, but further significant study would be needed to prove or disprove this.

The module activities also appear to have been successful in their aim of encouraging students to meet and engage with their personal tutors and the underlying need for greater participation from them (Figure 2).

Student focus groups

During the 2010/11 academic year three focus groups were held, each comprising four students studying the second year of the mechanical engineering programme. These students had taken the EPPS module during their previous year. All the participants had

Figure 1.
Student perceptions
of learning and
enjoyment

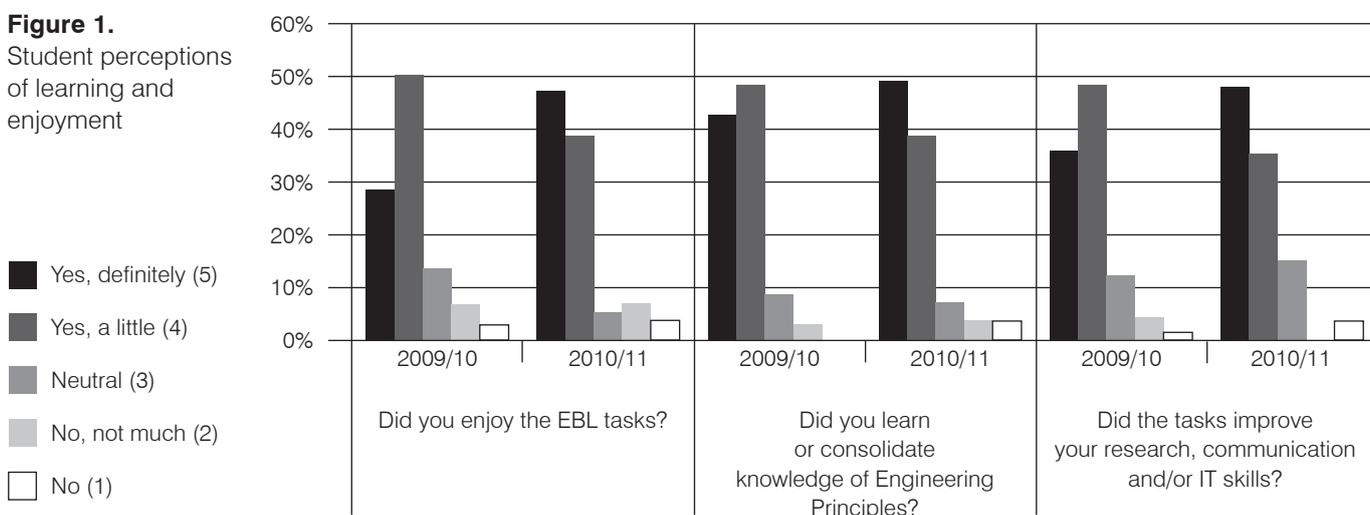
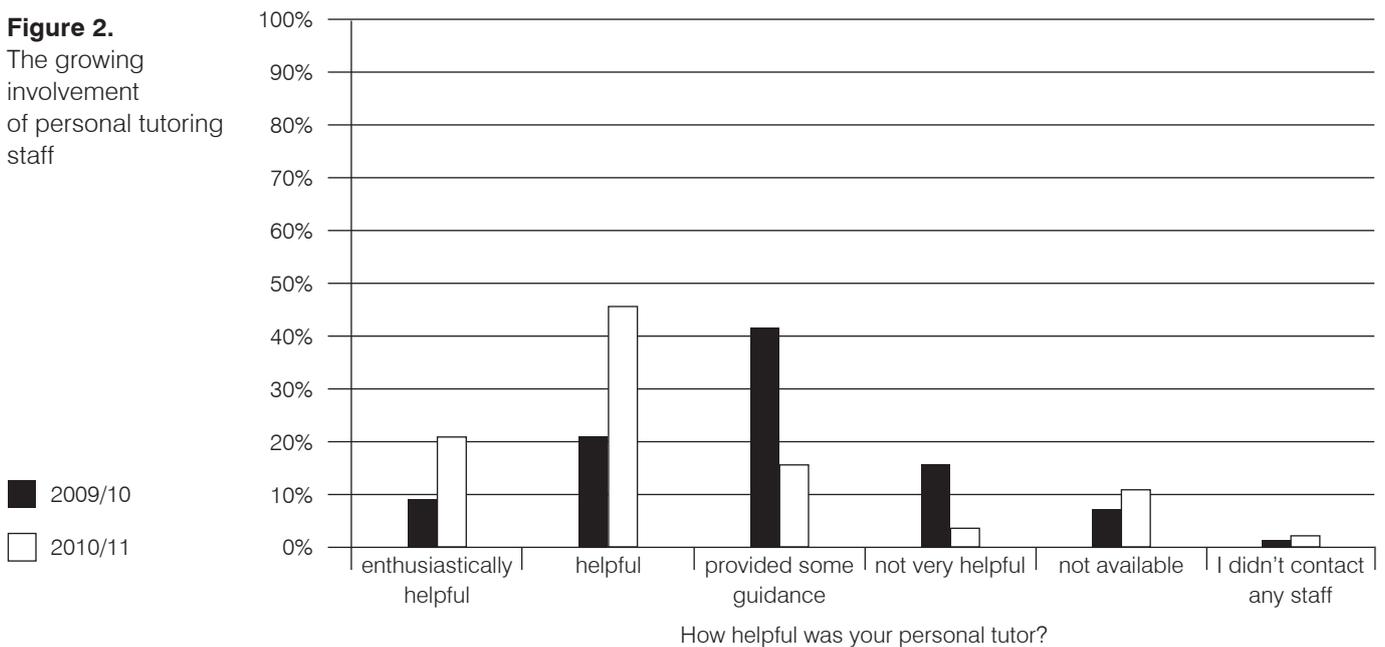


Figure 2.
The growing
involvement
of personal tutoring
staff



entered university immediately after taking A levels almost exclusively in mathematics and science related subjects, after a gap year or after successfully completing the Loughborough University Science and Engineering Foundation Studies programme. All participants seemed genuinely interested in the evaluation being undertaken and were keen to speak of their personal experiences of the module.

Participants were asked to recall their opinion of the module at the time when they were undertaking it. Interestingly, all of the students had extremely good recollection of the module content and made very similar comments about it. These indicated that participants felt that some of the lectures were boring whereas the group work proved popular.

Participants were asked to explain how they felt about making contact with their personal tutor at the commencement of their first year and whether or not they felt differently about this as the year progressed. None of these students had felt anxious about contacting their tutor at any time and all praised their individual tutors and the value of the relationship.

The lecture-free project week in semester 1 is an integral part of EPPS where the students undertake two group work assignments. The students all welcomed this break from the traditional lecture/tutorial format at a time when they felt their workload was building up. However, their feelings about the specific activities in which they participated varied. A

selection of the comments made is shown below:

'The break was good; we could use one this year [...] it gave me a chance to catch up on work.'

'The group car work was fun. The business game was quite good fun too [...] fun games with real life lessons.'

'The activities were a bit naff.'

In addition to ascertaining whether students had found individual components of the module enjoyable and pertinent to their studies, and with the inclusion of study skills workshops in the syllabus, an attempt was made to determine whether the students had learned about how they actually learn. All but one felt that the module had contributed to their understanding of *how* they learn. Comments made included: *'I've realised that for me it's easier to learn if I'm doing it rather than just sitting in a lecture being told how to do it.'*

When students were asked what they found most useful three aspects of the module were detailed:

'The workshop week was useful and good but we needed more time on the machines [in EBL4].'

'The best part was the big project and the project management part was useful [EBL4].'

'Group work was particularly useful.'

Finally, participants were asked for their retrospective opinions of the module from the perspective of their second year. All agreed that they had a greater appreciation of the module now than at the time of undertaking it during the previous year. At that time, they were more concerned about the fairness of marking schemes and the timing of events whereas now, with hindsight, they felt that they had benefited from the activities. The comments of two individuals follow:

When we were doing the module I can remember in week 5 enjoying making the buggy but thinking what's the point of this. Now looking back [I] would like to do another day like that [...] it's beneficial to be working as a team, you need to cooperate [...] Thinking back, I believe that the group work taught me to voice my opinions but I didn't realise that at the time.

Much better than at the time, my main memory of it is the final project, which was the best [...] I wouldn't cart around chasing marks again because I think the module is designed to help us develop skills that are difficult to measure. It would be great if we could have a similar module in our second year.

Staff interviews

Individual interviews were undertaken with six personal tutors and the staff who are involved with delivery of the module.

Participants were asked whether they perceived that this module had affected their tutees' attitude to study. All the replies were affirmative and confirmed that they generally had a better relationship with their tutees than was previously the case: "Now I see them more as a group, I used to probably have it half as group and half individual sessions. I probably have more group sessions now just because of the group activities."

Personal tutors who are not directly involved with delivery of the module were asked whether they were aware of the module content and the aims of the module. All staff interviewed were aware, but not in detail:

I obviously only interface with a fairly small part of it, the part to do with my personal tutees. Some of the exercises the students work with me but there is

a lot of the module where the personal tutor doesn't get involved in and obviously those parts I don't know anything about. [The module leader] sends through material on it [...] when we were actually getting involved I had a look at the module [VLE site] to see what sort of context we were supposed to be working in.

Members of staff were asked to describe their initial feelings about the module. All staff, whether they were directly or indirectly involved with the module, replied with positive comments, such as:

[Undergraduate study] is an expensive game, we are going to be seeing changes in the customer requirements and clearly the secondary education system has moved towards exam driven achievement, and interpersonal skills etc., have been neglected to some degree - that's why I'm positive on this.

A staff member who assists with delivery, but only in project week, commented that: 'I'm happy to be involved with the module and contribute to it. I'm keen to develop engineers.'

In addition to their first thoughts, members of staff were asked to explain if their feelings had changed after taking part (all those interviewed had been involved with the module for more than one academic year). All interviewees continued to be enthusiastic and, in one case, the response reiterated the comments that were made by the student focus groups:

I've talked to my tutees quite a lot about how they feel about it, because that's more important really, and they're very positive. I get the impression that they find it a very useful exercise and it's also a nice break for them from the pure academic work - but they do keep stressing that it's not just a bit of fun that they think they're learning things [...] they have lots of small niggles but they're generally very positive. I think [the module] has good aims and generally succeeds. I think there are ways that it can be improved but it is growing and evolving.

Staff were asked if they thought the module had any perceived disadvantages. The only disadvantage mentioned by some was that many of the activities are labour intensive for staff.

Written feedback obtained during project week

Students were invited to submit comments about the EBL2 business simulation exercise in autumn 2010 after adjustments had been made to address earlier criticisms relating to the design of the activity and the marking scheme. At the end of the exercise, they handed in a short report on a *pro forma* template and space for feedback was simply added to this. A selection of the comments follows:

'Overall the day was enjoyable; we believe we have gained some hands-on experience of what it may be like to run a business that would not have been attained through lectures.'

'I believe that today was a success for us as we have gained knowledge and at the same time had some fun.'

'Thoroughly enjoyed the session, raised my awareness of various aspects of business and let me understand how this applies to mechanical engineering.'

'A very challenging and thought provoking exercise - extremely enjoyable.'

The exercise was introduced in 2009/10 and was certainly better received during its second year. However, there were some negative comments relating to the lack of clarity of the assessment criteria and the whole-day time commitment, but these were in the minority.

The module leader noted the perennial difficulty of teaching business topics to engineers who can rarely see the relevance. This exercise goes a long way to addressing this problem.

Conventional module feedback – 2008/09 and 2009/10

Towards the end of each module, during a timetabled lecture or tutorial session, generic questionnaires are circulated to all attending students. These questionnaires pose questions with multiple-choice, 5-point "Likert" type options relating to module content, teaching facilities and teaching quality. In addition there is space for students to write comments relating to what they liked about the module and how the module could be improved.

In the academic year 2008/09 there were 62 (51%) completed questionnaires received and in 2009/10 both the cohort and the return rate

were slightly higher at 90 (64%). These included a relatively large number on which additional text comments had been added (32 in 2009/10). The written feedback was, in general, extremely positive.

Students commented that their interest level was raised by the "real" experiences and that the tasks were enjoyable. Some expressed strong praise, for example: *'A superb module and really puts your engineering minds to work.'*

Some individuals, however, disliked one or more of the elements. The three areas that received criticism were:

- the overly competitive marking schemes for the week 5 activities, where failure to perform well in the simulations could mean very low or even zero marks
- the lack of sufficient challenge initially and element of chance in the business simulation activity
- the timing of the major project with respect to the start of the examination period.

Conventional module feedback – 2010/11

This feedback was obtained after the module evaluation had been completed. There were 142 students registered on the module and 64 completed forms were received, 40 of which included additional comments.

By 2010/11, developmental changes had been incorporated to address the earlier criticisms, in particular to reduce the effect of the competition on marks and to improve the business simulation task. Improved online teaching materials were also added for the major projects EBL3 and 4. When this feedback is compared over the three-year period, the overall positive response rate has risen from 63% to 72%. 78% now answer positively that the module had developed their understanding of engineering (was 69%) and 82% think the module was well organised compared with 58% previously. 84% think that the learning resources were good (previously 71%). In every instance, the vast majority of those that didn't answer positively were neutral in their response, with only a handful of negative entries.

Written comments, which are optional, are seldom added to mechanistic module feedback and are generally indicative of either engagement or serious disenchantment.

Comments made in response to the question asking what the students liked about the module followed the familiar pattern: *'It was good at linking engineering principles to "real life" situations. Practical aspects of the module – reinforces the theory taught in other modules. Well thought out module; interesting tasks.'*

Comments relating to how the module could be improved included useful suggestions for further development: *'More workshop time and training. More practice in manufacturing. It would be better if most projects are peer-assessed.'* (Presently this only applies to the major project.)

The lack of criticism aimed at individual activities is encouraging and suggests that the ongoing changes to the module have been broadly successful.

Conclusions

The members of staff and students who contributed to this evaluation view the module as having a positive effect on both student engagement and the development of student team working skills. It was also established that there had been an improvement in the working relationships between personal tutors and their tutees since the introduction of this module. Personal tutors were only reluctantly visited in the past but now many students appear protective of their own group and certainly much keener to ask their tutors for advice. The tutor role has been extended, with tutor groups now competing against each other in the activities and academic staff often taking a keen interest in their group's successes and failures and providing helpful consultancy. Most students engage with the module, become better learners and use the transferable skills they develop elsewhere in their degree programme. Barriers between staff and students are being broken down.

Students also claim that they improve their practical and study skills and talk of the value of "real world" applications of technology that are in great demand by employers yet all too often lacking in graduates. It is, as yet, unproven that operating these interventions alongside traditional engineering science delivery actually adds value, even though success rates over the last three years have steadily improved. It must be recognised that other factors, such as improving intake grades, may also be contributing to this. The fact that

the module coexists with conventionally taught engineering science modules has meant much less disruption than a complete programme-wide reorganisation would have required and it allows those academics who have been schooled in convention to continue with what is familiar to them.

The evaluation also revealed some less favourable comments from students concerning individual elements of the module. These can often be traced back to where a student from a culture where marks take priority over learning outcomes had received a poor mark. A number of students clearly disliked one or more of the tasks, but this is hardly surprising. Overall, the students considered the benefits of the module to far outweigh any shortcomings. The module is still under development and improves year on year by obtaining and acting on feedback. Some of the earlier perceived shortcomings have already been remedied.

It is important to note that there is a strong consensus regarding the benefits of the module, as evidenced by the module feedback forms, information freely given in the student survey and the earlier anecdotal evidence that was instrumental to the initiation of this evaluation project.

Looking to the future, the School plans to continue to run the module in its present form and to carefully monitor the feedback. Discussions are already taking place as to how the concept of parallel enquiry based learning might be extended into the later years of the degree. To some extent this is already happening, in that Loughborough has long been a pioneer of extensive project work, including working with industry. Nevertheless, there is thought to be potential benefit in continuing with an identifiably similar structure in year 2 (EPPS2) which would have a stronger focus on the application of engineering science and analysis.

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Contact details

Peter Willmot School of Mechanical & Manufacturing Engineering, Loughborough University, UK.
Email: P.Willmot@lboro.ac.uk

Glynis Perkin Centre for Engineering and Design Education, Loughborough University, UK.
Email: G.Perkin@lboro.ac.uk

Appendix 1 Online survey

Section A: ABOUT YOUR GROUP	
QUESTION	POSSIBLE ANSWERS
1. Tutor group identifier	1 through 24
2. How many students are in your tutor group?	4 through 7
Section B: ABOUT YOUR APPROACH TO THE EBL TASKS	
3. Select the statement that most closely resembles your team's approach to planning	<ul style="list-style-type: none"> • we did what was needed at the time • we made a plan and stuck to it • our plans developed over time • we made plans but events overruled them • we didn't plan • we panicked near the deadline
4. How helpful was your personal tutor during the tasks?	<ul style="list-style-type: none"> • enthusiastically helpful • helpful • provided some guidance • not very helpful • not available/didn't respond • I met with other staff instead • I didn't contact any staff
5. Which statement best describes your own role in the team?	<ul style="list-style-type: none"> • I take ideas and make them work • I've lots of energy and challenge others to move forward • I see things through to the end • I'm a creative problem solver • I think hard and see the big picture • I apply my expert knowledge or skill • I was team co-ordinator • team worker • I explore new ideas with energy • I generally took a back seat
6. Was the research topic for EBL3 chosen by the team, your own first choice?	<ul style="list-style-type: none"> • yes • no
7. Did you use the module's self-teach resources on the VLE (Learn)?	<ul style="list-style-type: none"> • I didn't try them • I tried briefly but decided not to continue • I used them quite a lot • I used them extensively
8. Applicability of using Self Teach methods	<ul style="list-style-type: none"> • no comment • I don't like self teach • I'm pretty neutral about this • I rate self teach facilities highly as a method of learning
9. Select all the other information sources you used in completing the EBL tasks?	<ul style="list-style-type: none"> • internet • books • journals and/or magazines • electronic library resources (eg metalib) • course notes • external organisations • local companies, shops etc • examining physical objects • lecturers

	<ul style="list-style-type: none"> laboratory staff media services library staff other students or mentors parents/family
10. Indicate any additional significant resource you used	Free text
11. If I were to start again, this time I would?	Free text
Section C: YOUR RESPONSE TO THE EBL TASKS	
12. Did you enjoy the EBL tasks?	<ul style="list-style-type: none"> yes, definitely yes, a little neutral no, not much not at all
13. Did you learn or consolidate knowledge of engineering principles by completing the tasks?	<ul style="list-style-type: none"> yes, definitely yes, a little neutral no, not much not at all
14. Did you learn about copyright law?	<ul style="list-style-type: none"> yes, definitely yes, a little neutral no, not much not at all
15. Did the tasks improve your research, communication and/or IT skills?	<ul style="list-style-type: none"> yes, definitely yes, a little neutral no, not much not at all
16. Time allowed for the assignments	<ul style="list-style-type: none"> much too long too long about right too short much too short
17. I would have preferred more formal class sessions in the project	<ul style="list-style-type: none"> yes no
18. The best assessment method for a student centred project is?	<ul style="list-style-type: none"> written report video report oral presentation written (timed) test viva-voce (oral) exam pre-reading and open-book exam
19. Roughly how many hours did each student in your team spend on the research project (on average)?	<ul style="list-style-type: none"> 1-5 5-10 10-15 15-20 20-25 more than 25

20. In your opinion, how many students in your team made a significantly lower than average contribution to the tasks?	<ul style="list-style-type: none">• 0 - even work distribution• 1• 2• 3• 4
21. Would EBL be better replaced with a traditional lecture programme?	<ul style="list-style-type: none">• yes• no
22. This project has made me....	<ul style="list-style-type: none">• more interested in mechanical engineering• less interested in mechanical engineering• neither of these
23. What was the best thing about this experience?	Free text
24. How would you improve the EBL tasks?	Free text
25. Do you think the School should provide additional facilities or resources for this module and if so what?	Free text