Student-led, employer-focused, extra-curricular activity: a method of enhancing employability skills at Imperial College London and Loughborough University

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**Abstract**

This paper introduces the concept of student-led employer-focused, extra-curricular activity and describes two case studies: well-established similar activity at Imperial College London and relatively new activity at Loughborough University. The motivations behind supporting such activity are set out including their timeliness in the current Higher Education (HE) climate. Difficulties encountered and sustainability issues are also discussed. Initial experiences find student-led activity to be both extremely beneficial and excellent value for money.

**Introduction**

Employability skills and student engagement are currently a focus of debate and discussion, and, along with retention and progression, will become even more significant in the UK as increased tuition fees come into effect. UK Universities will need to demonstrate, in a clear manner, value for money and good employment statistics. It is the responsibility of institutions to provide a well-rounded value for money experience (Government White Paper, 2011).

Also on the agenda for science, technology, engineering and mathematics (STEM) departments is retention within the discipline beyond the degree. Much is published on this topic as employers look to recruit world-class graduates into their companies (Lamb, Arlett & Dales et. al., 2010).
This paper describes how student-led, employer-focused extra-curricular activity as implemented at Imperial College London for many years and at Loughborough since 2010, enhances employability skills and student engagement while also aiding retention both within the discipline and beyond the degree. As it is low cost and low risk, the initiative also provides good value for money.

**Background**

Terms such as ‘employability’, ‘student engagement’ and ‘extra-curricular’ are popular terminology; especially in the current harsh financial climate; however, definitions of their meaning, in a HE setting often vary according to the activity or the context. For the purpose of this paper the following definitions and descriptions are used to clarify the authors’ stance on student-led activity and its benefits.

**Employability:** Yorke (2004) describes student employability as:

> A set of achievements – skills, understandings and personal attributes – that make graduates more likely to gain employment and be successful in their chosen occupations, which benefits themselves, the workforce, the community and the economy.

**Student engagement:** Trowler (2010) provides the following definition:

> Student engagement is concerned with the interaction between the time, effort and other relevant resources invested by both students and their institutions intended to optimise the student experience and enhance the learning outcomes and development of students and the performance, and reputation of the institution.

Trowler gives the following aims and purposes of engagement:

- To improve learning
- To improve throughput rates and retention
- For equality/social justice
- For curricular relevance
- For institutional benefit
- As marketing
- Economics of engagement

One possible target of engagement is extra-curricular activities.

**Extra-curricular:** Extra-curricular activities are those that occur outside the formal curriculum. They can be difficult to pin down in a HE context and often mean different things to different people; they may include voluntary or paid work, projects, and short term or long-term placements (Tchibozo & Pasteur, 2007).

Student-led activity is a subset of extra-curricular activity.

**Student-led activity:** The extra-curricular activities discussed in this paper are voluntary, involve groups of students starting up and running a project or society
themselves. They are often activities that are related to the degree/discipline being studied. This particular type of extra-curricular activity has been termed ‘student-led activity’. Academics, employers or Professional Bodies may (and usually do) offer advice, contribute or otherwise input into the activity, but it is the responsibility of the students themselves to make it happen and to ensure that it is successful. For the student-led activity described at Loughborough and Imperial, the focus of activity to date has been within the STEM subject area.

Student-led activity is therefore an extra-curricular method of student engagement which the cases in this paper show enhances employability skills and aids retention within the discipline.

**Case study: Imperial College London**

**Background**

Imperial has a long record of student-led societies which are, like most universities, mostly supported through its Students’ Union system. However, as a project management lecturer in engineering, Ahearn (this paper), found in the early 2000s that she was being consulted on many ‘non-union’ projects that operated outside of the system. These were usually student groups too small or too specialised to qualify as a student society but which ran budgets of up to £80k. The Faculty of Engineering appointed Ahearn (this paper) as ‘Tutor for Student-led Projects’ in 2008, formalising her role in supporting student-led projects and similar schemes. Imperial has a clear mission statement for the Tutor:

To assist students engaging in extracurricular activities that are “by the students, for the students” and are beneficial to them as:

(i) students at university;
(ii) future engineers; and/or
(iii) ethical graduates (global citizenship).

(http://www3.imperial.ac.uk/envision/experiences/strategyforstudentledschemes)

Students involved in these activities can join Imperial’s employability award scheme which works on a points accumulation system (http://www3.imperial.ac.uk/2012/getinvolved/cv2012). Within the Faculty of Engineering at Imperial, recognition of the value of such activities is demonstrated through their strategy for student-led schemes:

The Faculty of Engineering ... owes a duty to recognise and encourage those proactive students who aspire to ‘make a difference’, even before graduation, and to inculcate similar values in its less proactive students.

(http://www3.imperial.ac.uk/envision/experiences/strategyforstudentledschemes)

As the activity at Imperial has developed iteratively over the years, it has not been the focus of academic research and has only limited external academic dissemination (Alpay, Ahearn & Bull, 2011). It was as a result of the Royal Academy of Engineering and Engineering Subject Centre’s report ‘Engineering Graduates for
Industry' which included a case study describing student-led activity at Imperial College London (Lamb, Arlett & Dales et. al., 2010) that the level of ongoing activity at Imperial began to receive significant external interest from academics.

**Motivations for providing formal support to student-led activity at Imperial**

A key motivation for formalising support to student-led activities was to give Ahearn (this paper) authority to bring the student-led projects under College protection via financial systems and via insurance. This permitted risk assessment systems to be regularised and enabled support/administrative staff to give official time to the cultivation of the student activity. Additionally, it demonstrated to students that the university recognised and valued their efforts.

The formal existence of the role made it much easier for students to know that there was someone to contact for support and access to wider strategic knowledge and institutional memory. There are a multitude of existing local and national schemes and funding opportunities that students with new ideas will generally be unaware of and the Tutor helps students ‘tap into’ these existing resources.

Finally, the reputational advantage to Imperial is obvious: supporting students on sophisticated spare-time activities reduces the risk of inadvertent damage to the College reputation and ensures that inspiring projects can be noted and celebrated. There is not any advantage to an institution in leaving students to go off on their own, invoking the institution’s name to sponsors but without giving the institution any oversight.

**Examples of student-led activity at Imperial**

At Imperial, as student-led activity has been well developed for a number of years, many individual projects have their own web pages run by students. Each group of students has a different set of motivating factors and interests; therefore they create a unique activity involving different combinations of other possible elements of extra-curricular work. Some groups operate solely within one engineering or STEM field; others work well with, and even need input from, a number of disciplines (preparing students well for future team work).

Examples of a few of the established student-led activities at Imperial include:

- **E.quinox**: award-winning electricity-generating schemes in Rwanda.
- **Raincatcher**: rainwater harvesting and storage for Tanzanian schools.
- **Robogals**: Robotics for schoolgirls; Outreach services for Institute of Engineering and Technology.
- **El Salvador project**: Ten years of students undertaking earthquake and flood mitigation work.
- **Women in SET**: Outreach to schoolgirls for STEM; celebration/profile-raising for women and support/training for careers/study in male-dominated disciplines.
A longer list of both Imperial and Loughborough examples, with links to student web pages if applicable, can be found at The Centre for Engineering and Design Education (CEDE) website: [http://cede.lboro.ac.uk/studentledactivity](http://cede.lboro.ac.uk/studentledactivity)

**Difficulties encountered at Imperial**

At Imperial, the plethora of student-led activity has meant that major student initiatives can remain relatively unknown, even in situations where students attract significant funding (for example, $100,000 for the e.quinox project). Administrative systems designed for smaller budget activities are not designed for fast-moving projects with complex supply chains and large donations from industry. Engineering has inherent physical, financial and reputational risks, which can initially appear alarming to College lawyers. Although strong and enthusiastic relationships exist with the Students’ Union, the systems can be complex and discouraging to start-up projects. Knowledge transfer amongst student leaders is vital, but hardest to achieve with those who need it most, as they are less likely to seek out the Tutor. The Tutor proactively monitoring students without imposing on the students requires a delicate balance: student autonomy is key to student-led projects. Very small issues, such as difficulties with room booking systems, can be disproportionately discouraging to students, whereas they seem undaunted by an annual fundraising target of £40k on a project.

**Sustainability at Imperial**

The difficulties listed above have required solutions in order for the scheme to be sustainable. Strong working relationships between Imperial and the Students’ Union meant that a working party formed, looking at a wide range of extra-curricular activity and identifying a system for bringing small but complex projects under the umbrella of the union, giving a protocol for risk assessment and the provision of insurance. Proactively identifying support staff who are willing to be a contact for student projects has enabled students to build working relationships with people who know the institutional administrative systems (finance, space, risk, events, catering, etc). This has released Tutor time to concentrate on advising students on more fundamental project-management and project mission matters.

Development of the student-led symposia concept (Ahearn, Perkin & Lamb, et. al., 2012) has been the single most useful development because it has enabled higher-profile projects to form a peer group for knowledge transfer, plus a showcase for making College members, institutions and industry more aware of the student efforts. The inter-university working relationships have created a step-change in the external recognition of the scheme, which in turn has increased their internal profile within the institution, leading to better acknowledgement of student successes, and attracting further student-led start-ups.

**Case study: Loughborough University**

*Background*
Loughborough has a well-established institutional ethos to work with employers to develop industry-ready graduates; this employability agenda is, in the main, either part of the curriculum or related to industrial placements, building on the knowledge that:

Graduates are more likely to be equipped with the skills that employers want if there is genuine collaboration between institutions and employers in the design and delivery of courses (Connor & Hirsh, 2008).

The Government’s White Paper (2011), ‘Students at the Heart of the System’, also advocates:

Encourage greater collaboration between higher education institutions and employers to ensure that students gain the knowledge and skills they need to embark on rewarding careers.

On discovering the scale of activity at Imperial, it was recognised that a further method of achieving this is through employer-focused extra-curricular student-led activities. Such activities already existed at Loughborough both within and across departments but were not formally supported and operated mainly through the Students’ Union system, as at Imperial. They are acknowledged through the ‘Loughborough Employability Award’ which recognises the value of student participation in non-curricular activities. Points are awarded for activities and when students have obtained a sufficient number of points they gain the award. This appears alongside their degree qualification on their Student Transcript (http://www.lboro.ac.uk/service/careers/experience/employability/award/index.html).

**Motivations for providing formal support to student-led activity at Loughborough**

Loughborough has been providing dedicated support for student-led activity since 2010, as a direct result of being inspired by Imperial College London. Discussion of the Imperial activity among colleagues in engineering and science schools at Loughborough University led to submission of a bid to the National HE STEM Programme (http://www.hestem.ac.uk/) for funding to start up similar activity. The bid was strongly supported by both employers and Professional Bodies who continue to provide valuable input into the resulting developments at Loughborough.

The primary motivations for Loughborough were that if student-led activity motivated students at Imperial, then it would be worth exploring if something similar could be done at Loughborough. Loughborough already had a strong record for providing a good student experience, topping the Times Higher Education’s Best Student Experience poll for five years in succession (http://www.lboro.ac.uk/about/achievements/best-student-experience.html). Both staff and students are therefore already motivated to trial new ideas in this area. The key desired outcome was enhanced employability prospects.
**Examples of student-led activity at Loughborough**

The new student-led activities that have been initiated at Loughborough, supported through CEDE, are:

- **The Mars Aerobot Project**: an interactive model for the National Space Centre.
- **Chemical Engineering Industrial Trips**: the students arrange site visits to employers in their field: a ‘learned society’ activity.
- **EcoFuture**: an energy saving challenge targeting users’ behaviours, locally.
- **Engineers without Borders**: a Loughborough branch of this national society.

**Setting-up student-led activity at Loughborough**

HE STEM funding was secured to stimulate and initiate student-led activity in the STEM disciplines at Loughborough. In May 2010, emails were sent to students informing them of the possibility of starting a student-led activity. A ‘carrot’ of £1,000 per project was offered to students to focus attention in the first instant. Initially it was difficult to find the best approach to students that would generate interest and a number of different methods were explored including: via the Students’ Union, student departmental committees and senior management. However, by far the most successful method was using departmental administrators to send out emails to their students.

Senior academic staff and support staff were fully apprised of the initiative and they responded by offering their full support. In addition, members of Professional Bodies along with employers from a range of businesses offered their time, expertise and ideas for possible projects.

Many (150+) students registered an initial interest, but these numbers quickly reduced as students realised that they needed to submit a written bid that should include ideas for sustaining the activity beyond the 2010/2011 academic year. Furthermore, successful students were required to submit an interim report and a final report. The submitted bids were reviewed by a panel, comprising academic staff, employers, and members of Professional Bodies. Four projects were successful in obtaining funding and were up and running by October 2010. Meetings between employers, Professional Bodies and other interested parties provided invaluable support to these projects and each project had a mentor (from either industry or academic staff) as well as a nominated CEDE staff member, Perkin (this paper). Additionally, the project provided an opportunity to develop an excellent relationship with staff and students from Imperial, which in turn brought into focus other opportunities for working together to extend the benefits of student-led activities.
The process of setting up student-led activity has been documented in the form of a checklist ‘Developing and Implementing Student-led Projects (http://cede.lboro.ac.uk/studentledactivity/#checklist) that can be used by other universities.

**Difficulties encountered at Loughborough**

Setting up the student-led activities proved to be more time consuming than expected and some unexpected difficulties were encountered. It was envisaged that each student-led activity would set up a society within the Students’ Union at Loughborough, as this would ensure that students had insurance cover for their activities. This proved to be challenging. Engineers without Borders were successful and very quickly set up their society. However, the other three groups encountered difficulty as their activities were considered by the Students’ Union, to be too specialised or only suitable for a minority of students. This was an unexpected obstacle and although Perkin (this paper) spent considerable time negotiating with the Students’ Union she was unsuccessful. In addition to concerns relating to insurance, there also ensued difficulties with the transfer of start-up funding to these groups. Eventually the students set up their own ‘community’ bank accounts and payments were processed. Students are currently exploring the option of establishing a ‘student hub’ (an initiative started by students at the University of Oxford (www.studenthubs.org/) which may overcome this issue in the future. Another challenge was that of arranging meetings with the students as STEM subjects have heavily loaded timetables. This was only a problem initially when the most support was required to get activities up and running.

The final difficulty was, not surprisingly, that of sustainability. The students in their initial bid for funding addressed how they would sustain the activity beyond one academic year, however, once their interim reports were submitted it became apparent that they had neglected this area. The groups were reminded of this requirement and, by the end of the academic year; they remedied this omission by ensuring that students in their penultimate year were given roles related to the running of each activity.

**Sustainability at Loughborough**

The initial activity at Loughborough was generated with a relatively small amount of external funding, some of which was given directly to the students to kick-start their activities. Staff input has worked out to be relatively low and, with success being a student responsibility, the venture is not only low cost but also low risk. As it therefore provides good value for money, it is easy to ensure continued senior management support.

All the students involved in the activities were keen and enthusiastic; they embraced their project and wanted to ensure its success, working well together with minimal
support from staff. The students exceeded expectations; they were unfazed by delays and were proactive in solving problems on their own initiative, for example, setting up community bank accounts to solve financial issues. The EcoFuture group have obtained further funding from an employer funding a new activity mentored by members of existing projects and the sponsor.

One of the projects undertook a specific development for an employer which came to a natural completion after the academic year ended, on reflection, sustainability could have been achieved if the students had been asked to ensure a follow on project. More successful, has been the implementation of student-led symposia as described in the Imperial case study. Also, after the first year, with established processes and good staff/student relationships in place, sustainability has become easier to achieve.

**Aims and purposes of student-led activity (staff perspective)**

The aims and purposes of student engagement as given by Trowler (2010) and listed in the background section of this paper clearly apply to student-led activity, therefore providing an indication of the benefits to be gained for those who would like to set-up a similar activity at their home institution. Students who sign up to this type of activity are usually highly motivated and providing them with extra-curricular opportunities enables them to explore areas of interest related to their degree discipline; this can lead to them believing more strongly in their subject area. Employers particularly value graduates who have combined their academic study with relevant activities beyond the assessed components of their degrees, recognising in particular the experience gained and the motivation and dedication demonstrated by these students (Lamb, Arlett & Dales et. al., 2010) and having relevant STEM work experience is a positive influence to becoming employed in a STEM job (Mellors-Bourne, Connor & Jackson, 2011).

Literature on student engagement and extra-curricular activity provides much discussion on both benefits and potential disadvantages. These arguments depend significantly on both the context of the activity and the perspective of the onlooker. For example, Tchibozo and Pasteur (2007) have found that students who have been involved with extra-curricular activity are more likely to obtain managerial positions after graduation. Conversely, they have also found that students who did not engage with extra-curricular activity gained employment more quickly, albeit at a lower level. The reason for this is not clear, however, the survey was not large; it contained 119 UK graduates. It may be that students who engage with extra-curricular activity have higher expectations regarding their employment prospects.

For student-led activity in STEM disciplines, the more general list of aims and purposes can be modified to read:

- **To improve learning** by undertaking student-led activity with curricular relevance
- **To improve retention** both within the programme and within the discipline beyond graduation through enhanced motivation, aspiration and passion for the application of STEM
- **To inspire other students and staff** noting the potential of young engineers and scientists to make immediate impacts and to change culture
- **To take knowledge into the wider world** with a sense of responsibility – a key role of anyone working within the STEM disciplines
- **To educate others** particularly the potential for outreach activity at school level
- **To encourage participation in university employability award schemes**
- **To encourage collaboration between students and staff**
- **For industrial liaison** and engagement of alumni in engineering/STEM
- **For institutional benefit**
- **As marketing** with emphasis on inspirational case studies and student ambassadors

**Aims and purposes of student-led activity (student perspective)**

So far, this paper has discussed the aims and purposes of student-led activity if taken from the university’s perspective. However, evaluation of the ongoing activity at Imperial and Loughborough has revealed, unsurprisingly, that such a list differs if taken from a student perspective.

Evaluation data has been acquired using a number of methods and has not been the subject of a formal research project. Firstly, students at Loughborough undergoing activities for the first time completed questionnaires and wrote reports on their experiences. Secondly, three student-led symposia have been held; these have involved in depth self-analysis of the process and benefits by the students themselves and have proved a key mechanism for three purposes:

- Evaluation data for staff
- Reflection for students – without exception, students quote these symposia as the point in time that they became aware of what they had achieved in their activity and an awareness of the employability skills they had therefore gained
- Sustainability (as described in the Imperial case study)

The data revealed what the students perceive to be the ‘best things’ and the ‘worst things’ about the student-led activities. Comments regarding the ‘best things’ were related to teamwork, experience and achievement:

- Teamwork – being involved in a real project.
- Good hands-on experience.
- That our ideas could be brought to reality and make a real difference to peoples’ lives.
Comments relating to the ‘worst things’ were related to juggling curricular/ extra-curricular commitments and developing the maturity to accept changing situations:

- Having to work around exam timetables.
- That team members had different levels of interest in the project, hence enthusiasm levels varied.

Overall, the feedback demonstrated that the students felt:

- They had benefited from being involved in the activities.
- Their activities had been worthwhile.
- They had had a positive experience.

Students who have undertaken student-led activity agree with the following list of aims and purposes (not in any rank order as this differs amongst students):

- Because it is fun
- To make a difference
- An opportunity to turn an idea/belief/passion into reality
- To continue or further develop an idea seen elsewhere
- For quantifiable reward (grant money; prizes; bursaries)
- For kudos
- To enhance a CV/ gain evidence of employability skills
- To gain points for a university employability award scheme
- To be able to make contact with employers
- For curricular relevance

Crucially, it is normally (although not exclusively) reasons from the top half of the list that motivate initial engagement; recognition of the other potential benefits come at a later stage, for example, following a successful interview for a placement year, a student reflected on his project experiences ‘It gives you an edge at interview; far more important than getting a first’.

Evaluation also revealed the types of students who undertake student-led activity. At Loughborough and Imperial, students can be divided into four groups:
Figure 1: Classification of students’ participation in student-led activity

Students in Group A are the most likely to start up activities, either taking up opportunities on offer or doing so completely on their own initiative. One such example is the group who started the Loughborough University branch of the national Engineers without Borders network. Although these students responded enthusiastically to the call for student-led activity and have interacted well with the support offered, they had already developed plans in this area and would probably eventually have found initial funding from other sources. Additional students have now joined the original project team to take part in the society’s activities.

Group B students will be inspired by activities on offer, or may respond to opportunities offered such as start-up funding. For example, the EcoFuture team at Loughborough had strong views on environmental issues and some ideas but needed the offered support and advice to get started. They have achieved highly winning national competitions and securing additional external funding.

The next group, Group C students, are likely to be participants rather than leaders in student-led activities. They will need support to engage, either from other students or staff. Finally, Group D students are only rarely likely to engage and probably would not gain much benefit from doing so as it may distract them from other core curriculum activities.

It is important to note that this pyramid diagram does not provide a direct correlation to student academic achievement; Group A students are not necessarily the highest academic achievers, although it is likely that they will obtain a good degree. Employers are not always looking for graduates with the highest grades, but also graduates with all round experience; they see this type of activity as an opportunity for differentiating between students (Lamb, Arlett & Dales, 2010).

An example from Imperial, illustrating this point, is that of the student who took over the leadership of the El Salvador Project in his second year of study. Predicted a 2:2 at this point, this experience motivated him not only to become leader on other activities but to also strive harder academically, eventually graduating with a 2:1 and gaining first employment with a leading energy company. Throughout this time he also held down a part-time job for financial survival.

Workshops held to discuss student-led activity and its potential with a wider audience have generally agreed with the above classification but have raised a question regarding widening participation issues – is student-led activity inclusive? Informal feedback from students engaged in ongoing activity indicates that it is - if students are motivated to get involved, they will find a way which works for them. However, this is an area which would benefit from further research. Another related question that has been raised at workshops is whether such activity should be within the assessed curriculum. Students have universally answered negatively to this.
question stating reasons such as it would making projects restrictive and take the fun away, but again it would be worthwhile exploring this further.

**Future work and conclusions**

Experiences at Imperial and Loughborough have shown that student-led activities appear to enhance employability skills, student engagement, and retention beyond the degree along with other indirect benefits such as employer-university liaison. Importantly, the activities are highly motivating and enjoyable for students. Formal support of student-led activity provides excellent value for money as initial financial input is low and staff input crucial but not overly time consuming.

At Imperial, it is noticeable that formalising the attention paid by staff to the student-led activities has resulted in better communication between staff and students and amongst different student groups. Forming a working relationship with Loughborough University has raised the profile of student-led projects within Imperial. Both Imperial and Loughborough's experience has shown that students are receptive to being recognised as doing something worthwhile and to having the employability benefits articulated, acknowledged and enhanced.

Longer term sustainable activity including student-led symposia, greater student-student inter-university collaboration, resources for other universities, discussion lists and alumni involvement are emerging from the initial concept of replicating activity seen at Imperial in Loughborough; these will bring further opportunities to all concerned and will be explored further.

Activity to date has been largely practice-based rather than theoretically based, which was appropriate to test the feasibility of a single transfer of effective practice. However, national statistics for this activity do not exist and, in the current economic climate and with the level of interest now being received from other institutions (over 35 institutions have attended related events), it would now be timely for this area to undergo significant rigorous research to establish not only the short-term benefits and disadvantages but also to explore long term effects.

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