Enhanced employer engagement with work-based learning (WBL) modules in engineering foundation degrees

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Abstract
Our main objectives in this project were to characterise the work-based mentoring support received by part-time engineering foundation degree students and to facilitate more effective understanding of the learning objectives and assessment requirements of work-based learning (WBL) modules supported by in-company mentors. We targeted the communication mechanism between mentors and academic tutors as an area in need of enhancement and sought a robust yet flexible solution for provision of module information, developmental discussion, student performance feedback and assessment schedules. The solution needed to be easily accessible, readily understood with minimal staff training, economical with mentor time commitment and applicable across a diverse range of sponsoring employers. The preferred option was utilisation of a Sakai-based Managed Learning Environment (MLE), which has functionality in common with other MLE platforms widely used in UK higher education.

Keywords: employer engagement, work-based learning, mentoring, foundation degree, communication

Background
Effective work-based learning (WBL) is dependent on a successful three-way relationship between student, academic tutor and in-company mentor stakeholders, especially in view of the wide range of staff career development and other organisational benefits of learning in the context of work (Roodhouse and Mumford, 2010). This relationship in turn depends on a clear understanding by all three parties of the WBL module's content, relevance, learning outcomes and assessment regime and the expected contribution of each stakeholder to a successful outcome (Benefer, 2007).
Figure 1. A simple graphic representing stakeholders in WBL and the communication links between them. The “traffic light” colouring of the arrows indicates the perceived quality of communication between stakeholders at the outset of the project.

Figure 1 illustrates the typical experience of academic staff at the University of Hull in delivering engineering WBL modules; specifically that, whilst the classroom communication between students and tutors is excellent, students frequently bemoan lack of sufficient access to their mentor and limited understanding of the module objectives by the mentor as a result. Furthermore, attempts to invite mentors into the university for briefings or discussion are often stymied by mentors’ multiple work priorities and the inability to define a mutually convenient time for a significant proportion (typically >30%) of the mentor “cohort”. As a result, there is a general reliance on the student to communicate academic information to the mentor which is fraught with difficulties:

- At the beginning of a WBL module the student cannot be expected to understand the scope of the content and learning objectives well enough to give their mentor a clear picture of what will be required in terms of support over the remainder of the module
- The student is almost always hierarchically below the mentor and may have difficulty in “managing” the support relationship
- Mentors are often not necessarily “in-company champions” of foundation degree learning – they may simply be assigned to the task – and hence the student’s needs may not be given sufficient credibility within the company environment
- Mentors are usually subject to many demands which prevent them from organising regular support sessions or meetings with academic tutors who, in turn, would have extreme difficulty in physically meeting with as many as 25 mentors several times during the course of a module.

These issues lead to the project objective of establishing a robust alternative direct communication channel between the academic tutor and the in-company mentor.

Rationale

At the University of Hull we have approximately 100 (employed) foundation degree (FD) students on three-year part-time courses studying Mechanical Engineering, Electrical and Electronic Engineering, Plant and Process Engineering or Process Engineering Management, originating from about 25 regional companies that range in size from SMEs to multinationals. Each programme has a Work-Based Learning module in each of the three academic sessions, namely:

- WBL1: Workplace in Context (Health and Safety) and Independent Study Skills (generic module)
- WBL2: Experience and Practical Application (a detailed problem-based study of a workplace issue)
- WBL3: Work-Based Project (usually addressing the issues studied in WBL2).

In terms of content, all three modules are typical of the reflective and enquiry-based learning common to WBL, and the role of the tutor shifts from being purely that of a teacher to that of a facilitator and expert resource (Lester and Costly, 2010). Each student is assigned an in-company mentor to assist and advise them in the completion of these modules, perhaps facilitating access to company resources, personnel or information, identifying technical challenges within the student’s workplace and/or supporting the student’s attempts to address such challenges. The mentor is generally assigned by the student’s line manager or the corporate manager authorising the studentship. Selection will depend on the mentor’s availability to the student and relevance of technical/departmental experience. Often the mentor will have limited knowledge of supporting the study of an academic module, especially at higher education (HE) level. It must be noted that, since students on the Hull programmes are drawn from about 25 different employers, there is an unavoidable variability in their experience of the WBL modules which arises from the workplace environment and the propensity for employer involvement, despite having clearly defined learning
objectives and a common on-campus classroom curriculum. These challenges are recognised elsewhere in HE-based WBL (Edmond et al., 2007).

In order to address the communication issues outlined above in Figure 1, a preliminary research exercise was carried out to characterise the interaction of students and mentors in-company and to examine the extent of the understanding of learning and assessment objectives by the mentors. The motivation for undertaking this research rested not only on the logistical problems of communicating with workplace mentors, but also on the perception of cultural differences between stakeholders in WBL (such as those noted by Benefer (2007)). These may be based on structural issues, such as the cycle of the academic year, or on "disparity of mission" caused by the various teaching, research and administrative responsibilities of academic staff in HE.

Anecdotal evidence led us to make the following initial observations:

- The student’s learning material (documentation) is often driving the student-mentor relationship; this can be too verbose and detailed for assimilation by the mentor
- The mentor may not be aware of the corporate benefits of WBL, generally seeing it (and sometimes the student’s entire degree course) in terms of the student’s own personal development
- The frequency of scheduled interactions between mentor and student may not mesh well with the rate at which learning objectives are delivered
- In large multi-divisional organisations the student (often a craft apprentice) may be required to relocate within the company, causing a discontinuity in mentoring.

Structured focus groups with a total of 31 FD students and a parallel set of structured interviews with ten employer representatives were conducted in order to elicit critical information about the mentoring process and how communication might be improved. The questioning was mirrored between the student and employer groups in order to compare and contrast perceptions. The headline results were as follows:

- Only 13% of students surveyed felt that their in-company mentors understood the learning objectives of their WBL modules and that they were prepared to furnish enough time for support on a regular basis (felt to be about 40 minutes per week)
- Only 25% of mentors felt that they adequately understood the learning objectives and could afford the necessary contact time
- Both students and mentors reported a lamentably low frequency of contact (averaging seven weeks between meetings), although there was a high degree of variability. This is clearly insufficient to address multiple learning objectives, provide information and feedback and inspire confidence in the learner
- 69% of students and 85% of mentors felt that a short face-to-face preparatory course/briefing for mentors would be beneficial, although misgivings were expressed about the ability to fit this around busy work schedules if travel off-site was required
- Both students and mentors would like enhanced interaction with tutors to clarify learning objectives and to provide real-time support and feedback on coursework. The lack of clarity about learning objectives outlined above clearly highlights a great deal of scope for information transfer to mentors
- Only 65% of mentors felt they could recognise the relevance of the learning objectives to the workplace. 45% would be prepared to have input to the definition and development of course materials, should the opportunity be offered.

The research shows that there is clearly a great deal of scope for improvement in the engagement of mentors. In particular, there appears to be a lack of buy-in from them (even though many are well-intentioned) due to lack of space in the workload of both the mentor and student. This may arise from the learner-centric nature of much HE provision; hence one observation that the WBL
course material needs to be a little more prescriptive, closely defined and deadline-driven in order to resemble the workplace ethos more closely. The HE institution clearly needs to be more pro-active in briefing both the mentor and student in the content, learning objectives and structure of the modules.

**The approach**

In the light of the above research outcomes, the project was faced with several issues:

1. How do we identify and engage the in-company mentor for a particular student in a timely manner from the inception of the module?
2. What is the best communication channel to use for direct access to/from mentors?
3. How do we prepare mentors to support the module?
4. How do we package module information for the mentor so that it is available, easy to assimilate and up to date?
5. How do we inform the mentor of module events and assessment deadlines?
6. How can we involve mentors in developmental discussions around study plans or project definitions?
7. How can we give performance feedback to mentors securely and in confidence?
8. How can we ensure that any commercially sensitive WBL material remains secure (i.e. some employers may be in competition with others)?
9. How do we achieve all of the above cost-effectively?

*How do we identify and engage the in-company mentor for a particular student in a timely manner from the inception of the module?*

This apparently trivial step requires careful management. Historically, the part-time student is admitted on the basis of satisfactory academic prerequisites, availability for day-release and the sponsor’s willingness to support him/her financially. Added to this, in the case of FDs, is commitment to mentoring. Hull’s application process has a requirement for this commitment to be authorised on the application form; however, there has previously been no requirement to identify a specific mentor within the organisation at this stage. Experience suggests that this precipitates problems subsequent to registration; extracting accurate and complete mentor details from the student cohort ahead of the commencement of teaching is a near impossibility, thus the application process has been modified to include mentor nomination and pre-registration. Admittedly, this does introduce an extra task for the applicant, but it provides the benefit that the mentor details are already on a database at the point of registration and can thus be made available to teaching staff for the purposes of communication. This timely gleaning of mentor data is an extremely important step, as attempting to do this retrospectively by email or verbal requests is a very hit-and-miss process.

*What is the best communication channel to use for direct access to/from mentors?*

The research conducted by the project into preferred communication channels initially favoured the use of email or telephone for communication with mentors (especially in the opinion of students), although this raises issues with the piecemeal nature of such methods in terms of being able to schedule telephone contact, provide module information and notification of events and assessment deadlines and manage email lists.

A more elegant solution is provided by the use of a Managed Learning Environment (MLE), and information and communication technology (ICT) solutions have been recognised in the literature as having significant potential for the support of workplace learning, although the mere availability of an ICT-supported solution is no guarantee that stakeholders will use it (Ford, 2006). At Hull the preferred system is EBridge, based on the Sakai platform. In terms of functionality, it is similar to other popular platforms (such as Moodle and Blackboard) and therefore the principle of our
solution should be widely transferable. The inherent benefit of using EBridge is that all of the WBL modules are already supported within it to service the educational needs of the students – all registered students automatically have access and training in the use of this MLE.

The project explored the use of EBridge to support external employee mentors and permission to provide mentors access to the appropriate modules was readily granted, despite the fact that they are obviously not registered students of the university. The three-way linkage sought between tutors, students and mentors was thereby established at a stroke within the pre-existing MLE structure of the WBL modules. Mentors are granted the same permissions as students in terms of the information they can view and which MLE features they can utilise, simply upon provision of a company email address and name. The mentor is then provided with a university username and password, valid for one academic session. The mentor has 24-hour read-only access, from any web-enabled computer, to all of the learning resources and assessment information associated with the module. Mentors are currently restricted to the Student site permissions because Instructor status confers class-wide access to submitted work and grading information, raising issues with data protection and commercial confidentiality (in terms of work-based projects or process studies). The possibility of giving mentors a different set of permissions to allow viewing of their mentee’s submissions/grade performance is not currently available, but would be desirable for the future.

Figure 2. A screenshot of the WBL2 site homepage, showing functions on the left-hand menu bar

How do we prepare mentors to support the module?

The project investigated two approaches. Firstly, all of the mentors for WBL1 were registered on the module’s EBridge site and a clear, extensive explanatory email was sent which invited them to explore and participate in the site and feed back to the project leader on its utility in provision of information and support of their mentoring activities. This was done when the module was already underway and therefore the mentors would have had some awareness of its content. As half-expected, this was a spectacularly unsuccessful approach! The nature of email is that it is easy to ignore, especially if other priorities are pressing. The lesson is that “lukewarm” stakeholders cannot be easily enticed by even a well-crafted email. A quite different approach was adopted with a second group of mentors who were registered for the WBL2 module. The project leader made a pre-arranged verbal presentation of the MLE system in person using hardcopy graphics and by software demonstration within the client company facilities. The outcome was the polar opposite of
the previous trial, with unanimous interest and approval for the system, and even the enthusiasm to independently set up in-company demonstrations for all company personnel involved with FD supervision. This underlines the importance of *taking the technology out to the user* in the first instance – the “human element” in persuasion and education is extremely important in the adoption of new methods of communication.

*How do we package module information for the mentor so that it is available, easy to assimilate and up to date?*

Obviously the primary target user for EBridge is the registered student. However, we must recognise the time mentor’s limitations, and to this end we have placed additional resources on the site which contain an abridged version of the student course materials (for example, a summary list of (mentor-related) activities within the WBL1 module) which allows the mentor to see his/her commitment without wading through the entire module’s learning materials. Should any issues arise, all of this content can be readily modified by the academic tutor in real time.

![Resources](image)

*Figure 3. A screenshot of a mentor support resource within the WBL1 module EBridge site*

*How do we inform the mentor of module events and assessment deadlines?*

The “Announcements” function allows broadcasting of module events to either the whole site membership or to interest-based or administrative Groups (for example, a Mentor Group could be set up or the Group could be students plus mentors from a specific company). The “Messages” function is similar to email and tends to be used on a more *ad-hoc* basis although, again, individuals, groups or the whole site can be addressed, including the ability to CC the message to a preferred email address – critical to attracting the notice of the mentor. Assessment deadlines are best viewed through the “Assignments” function, where due dates are displayed and a detailed explanation of any particular assignment is hyperlinked.

*How can we involve mentors in developmental discussions around study plans or project definitions?*

*How can we give performance feedback to mentors securely and in confidence?*

*How can we ensure that any commercially sensitive WBL material remains secure?*

All of the above are achieved either by sending direct messages to selected site members or by setting up company-specific or mentor-student-tutor Groups within EBridge. These groups are
(optionally) the target for announcements or messages, or alternatively a Forum can be established, membership of which is confined to the Group. Any discussion of a confidential nature is therefore invisible to other site members outside of the Group.

How do we achieve all of the above cost-effectively?

As the MLA ICT infrastructure is already in place and academic staff are conversant with its functionality, there are few capital costs involved in utilising this communication channel. Some administrative provision must be made for registration of the mentors on the EBridge site and to manage their transfer between subsequent modules at the end of academic sessions (contingent on the progression of the mentee). There is also in-company training time required for “company champions” of the EBridge mentor provision, but experience shows that this can be effected with an initial one-hour briefing, followed up by a further two-hour briefing of multiple mentors, delivered by the in-company champion (supported by a university tutor). Once the use of EBridge has been embedded, it is expected that the company will take ownership of the maintenance of staff competence in its use. This self-help model works elsewhere (for example, in customer maintenance of bought-in process equipment) and should therefore be workable in the engineering sector.

Assessment

As it centres on communication issues, the project did not have any direct objectives to impact student assessment; however, as improved mentor communication expedites the student in getting to grips with assessment tasks and enhances the quantity and quality of mentor input, it is expected that an overall improvement in performance will be noted at the end of the present academic session.

Evaluation

The evaluation of the project was conducted by telephone surveys in two main areas:

1) Student experience of the quality of mentor contact in support of the WBL2 module:
   24 students were surveyed: 17 (71%) reported that they felt that their mentor had an improved understanding of the module requirements following the introduction of the EBridge resource (a net gain of 58% over the initial survey) and 14 (58%) reported that the mentor had perceptibly heightened enthusiasm for the WBL topic as a result. None reported any detrimental effects.

2) Extent of WBL2 mentor utilisation of the EBridge site for informational purposes and tutor communication:
   Of the 21 mentors enrolled on the site, 19 (91%) confirmed that they had consulted the site in support of their mentoring sessions, of whom 16 (84%) stated that the availability of the resources had been of significant benefit to their knowledge and understanding of the learning outcomes and assessment regime of the module. This is a significant gain (+51%) on the 25% in the initial survey who agreed that they understood the intended learning outcomes of the module.

As the final assessment of the module has not yet been completed at the time of writing, it is not possible to say whether overall student performance levels have been augmented on a year-on-year basis. This will be the subject of a longitudinal study in support of on-going continuous improvement of module delivery.

Discussion, summary

It is felt that the utilisation of a MLE in support of FD student mentoring has been shown to be a valid and effective mechanism of communication and repository for module information.

It is not entirely cost-free in terms of the necessity of mentor/“champion” training and the administrative load associated with managing/maintaining mentor registration; however, the power
of this mechanism lies in its flexibility, adaptability and propensity for near-instant update. Other mechanisms of mentor support which were considered (telephone conferencing, email lists, on-campus briefings, etc.) lack the coherence of a MLE and involve operational barriers which are naturally overcome by an asynchronous system.

**Further development**

EBridge support will be rolled out across all engineering WBL modules in the forthcoming academic session at the University of Hull and administrative systems will be put in place to streamline the integration of mentors with the MLE module sites. Ongoing evaluation and consultation with client companies will take place to further refine the support service and its features. One area which is particularly ripe for improvement is the frequency of mentor-mentee meetings and it is felt that academic tutors can improve this in the future by including mentor-based activities driven by the EBridge site “Announcements” function.

**References**


**Further reading/bibliography**


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