"IT'S PART-TIME - BUT NOT AS WE KNOW IT!" - AN EVALUATION OF A FLEXIBLE LEARNING MENG

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ABSTRACT (250 WORDS MAX)

This paper reports on the evaluation of the effectiveness of the principles of delivery of a new flexible learning MEng (Hons) Engineering course at ~~Bournemouth University~~Bournemouth University (~~BU~~BU). The course was developed as part of a Higher Education Science, Technology, Engineering and Mathematics (HESTEM) National Programme project and provides an opportunity for engineers to take higher education qualifications while remaining in full time employment. The first cohort have all progressed from part time, day release Foundation degree Science (FdSc's) at either another Higher Education Institution (HEI) or ~~Bournemouth & Poole~~ Bournemouth & Poole College (~~BPC~~BPC) to take units at final year honours level. The development of online units for the MEng programme has been based on the Constructivist approach to learning~~. This approach has been manifested through the Mayes Conceptualisation Cycle [3]~~ and the delivery mechanism uses online learning materials delivered via a Virtual Learning Environment (VLE).

The paper details how each unit of study begins with a full day face to face tutorial on campus enabling ~~the tutor to give~~ an introduction to the subject as well as allowing 'faces to be put to names' thus mitigating the dehumanizing effect of pure online learning. It describes and evaluates how effective this is in "'kick starting'" the student to student relationship that is essential for an effective learning community to develop. The paper also evaluates how the use of both staff/student and student/student online forums, throughout all units, allows for this community to further develop and enhance the learning experience.

The ~~evaluation took the form of interviews with academics delivering the units and a focus group with students engaged upon the programme, along with an analysis of the online engagements via the discussion forums~~paper concludes that the implementation of a constructivist approach to learning has been very successful for this new course and first cohort o~~f students~~. This has enabled students to make the necessary transition and has resulted in a good depth of learning and engagement.

Keywords: flexible learning; engineering; MEng; virtual learning environment; online learning

1 INTRODUCTION

This paper reports on the evaluation of the effectiveness of the principles of delivery of a new flexible learning MEng (Hons) Engineering course at ~~Bournemouth University~~BU~~BU~~. The course was developed as part of an HESTEM National Programme project [1] to meet a demand to provide an opportunity for engineers to take higher education qualifications while remaining in full time employment. The course was validated in April 2012 and accredited by the Institution of Engineering Designers (IED) as meeting the academic requirements of Chartered Engineer (CEng) in May 2012. The first cohort have all progressed from part time, day release FdSc's at either another HEI or ~~Bournemouth & Poole~~BPC~~BPC~~ to take units at final year honours level. The course is designed so that a student engages with three 20 credit units per academic year, studying one 20 (10 ECTS) credit unit (200 hours of study) at a time, each of which is studied over a 10 week period, including assessment. Each unit is delivered via a Virtual Learning Environment (VLE) supplemented with face to face tuition. ~~Each unit starts with~~An initial ~~a~~ 1 day face-to-face introduction on campus starts each uni~~introduction on campus~~, and is followed by two further half day face-to-face sessions again on campus. The materials are delivered via the VLE using various media, such as notes, powerpoint presentations with synchronized audio, podcasts, tutorial questions as well as discussion activities

mediated through discussion forums. Each unit is supported via two mediated discussion forums, one staff/student and the other student/student. A cohort of 16 students commenced on their first honours level units in September 2012, all having recently completed FdSc's in either mechanical or manufacturing engineering on a day release basis.

2 LITERATURE REVIEW

As part of the development of the course the current practice and pedagogical approaches to flexible learning were investigated, along with codes of practice to ensure quality.

2.1 Pedagogy

The development of online units for the MEng programme has been based on the Constructivist approach to learning. This leads to a set of pedagogical principles [2]:

- Learning should take place in authentic and real-world environments;
- Learning should involve social negotiation and mediation;
- Content and skills should be made relevant to the learner;
- Content and skills should be understood within the framework of the learner's prior knowledge;
- Students should be assessed formatively, serving to inform future learning experiences;
- Students should be encouraged to become self-regulatory, self-mediated, and self-aware;
- Tutors serve primarily as guides and facilitators of learning, not instructors;
- Tutors should provide for and encourage multiple perspectives and representations of content.

Biggs, cited Mayes & de Fraitas [3, p6] suggests the most straightforward way to develop an appropriate pedagogical approach to e-learning is

> "by adopting the assumptions of a constructivist pedagogical approach, where the focus is always on what the learner is actually *doing*: placing the learning and teaching activities (TLAs) at the heart of the process."

This approach has been manifested through the Mayes Conceptualisation Cycle [3]

> "Mayes claimed that learning takes place when students engage in dialogue to test their conceptualization (exposure to concepts) and construction (application of concepts to tasks) of knowledge. Mayes stressed the need for tutor-student or student-student interaction that may be facilitated by tools such as virtual discussion boards or simulations" [4, p51]

Following this approach, the MEng course was designed to use a flexible learning approach combining online learning materials delivered via a Virtual Learning Environment (VLE) with face-to-face tuition. The course has been designed such that each unit of study begins with a full day face to face tutorial on campus enabling the tutor to give an introduction to the subject as well as allowing 'faces to be put to names' thus mitigating the dehumanizing effect of pure online learning. This design was aimed at "'kick starting"' the student to student relationship that is essential for an effective learning community to develop.

2.2 Current Practice

Fry& Love [4, p53] evaluating the use of VLEs within the business subject area concluded that

> "The findings suggest that behaviourist rather than constructivist models of learning currently define lecturers' use of the VLE. Lecturers should therefore be encouraged to question their pedagogical efficacy to facilitate students' learning (Livingston & Condie, 2006; Franklin, 2007; Zhao, 2007) and move towards the second stage of e-learning (Salmon, 2005). Crucially, lecturers must develop learning, teaching and assessment strategies that encourage students to take responsibility for their learning, and facilitate the shared construction of knowledge through student-student and student-tutor interaction."

The design of the MEng course has specifically attempted to avoid these pitfalls, with the academics engaged in developing the materials being made aware and provided with guidance of developing the those materials using a constructivist pedagogical approach. Similarly, the entire structure of the course was developed to encourage this type of approach.

2.3 Quality Assurance

The materials developed for this programme must comply with various precepts set out in the QAA Code of Practice (Section 2, Part B) on Flexible and Distributed Learning (FDL) [5].

The format for delivery for each online unit will be consistent as follows:

Each unit will be delivered in a 10 week block to include assessment – this should equate to 200 hrs learning for a 20 credit unit, thus 3 units per academic year.

Each unit to be delivered sequentially so a student is not studying units simultaneously.

Each unit will commence with a 1 day introduction followed by 2 further afternoon tutorials.

It is important to keep the student experience consistent between units, thus all units will be delivered via myBU and each unit will follow same structure on myBU~~BU~~:

- ~~Announcements~~
- ~~Unit Information – teaching schedule etc~~
- ~~Unit Materials – all actual teaching materials~~
- ~~Assessment – online assignment brief, tests etc~~

~~Discussion Board – this will facilitate inter-student discussion and where tutors should communicate with students. You must 'look at' the forum at least 2 times each week and respond to students' discussions as appropriate. Individual and confidential pastoral issues will be via email with the Programme Coordinator.~~

- ~~All units will have on-line assessment wherever practicable.~~

3 METHODOLOGY

In order to gain rich and reflective data this evaluation adopted a qualitative methodology. The evaluation took the perspective of both academics and students. The methods of data collection chosen took the form of focus groups using a semi-structured approach and semi-structured interviews with academics delivering the units. The focus group consisted of 7 participants. The use of a focus group~~s~~ and interviews enabled a more exploratory approach which resulted in rich data. To ensure consistency between the data collected via interview and focus group the same researcher conducted both using a semi-structured approach using the following similar questions which were aimed at exploring expectations and perceptions of a new learning experience.~~what…~~

The questions used were:

- What was your expectation about learning before joining the course?
- What were your feeling about the course?
- Is it important to actually come on site?
- How has the experience been different to your previous learning experience?
- Did you find the fact that other people asked questions useful – did you learn anything from other people's questions?
- What has been good about the flexible learning experience?
- What did you find difficult in the experience?
- What did you generally use forums for – eg admin, learning etc?
- Did the use of the forums actually help your learning?
- What would improve the experience?
- Is there anything that could be left out without impacting experience?
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Additionally an analysis of the online engagements via the discussion forums was conducted. This analysis took a quantitative approach to assess the number of engagements and a qualitative approach to analyse the nature of the engagements.

4 ANALYSIS OF DATA

4.1 Progression from traditional part time

The present cohort of students have progressed from FdSc's delivered in part time day release mode, which enabled them to remain in employment whilst pursuing academic qualifications. The flexible learning approach adopted by the MEng is intended to continue and enhance this advantage to, offering greater flexibility than day release to the students whilst thus further reducing the burden on their employers. When asked concerning their expectations about the programme the students agreed that this approach had definite advantages for them. One student who lives 30 miles from Bournemouth University said

'Flexible learning suits me this time round because of the availability of getting down'.
Another said

'You can structure it around you - it's really worked for me with the new baby I have been able to work around that whereas before on day release there were some real issues'

Based on one student's comment that coming onto the MEng programme was 'just a natural progression, continuing on from what we have done before – not worth what we have done before if you don't top it up', suggests that the purpose for the development of the programme to enable employees to gain higher level qualifications whilst in work, is being realised.

Concerning the burden on companies of their staff being given time to gain academic qualifications a student confirmed that even 'day release is quite a drain on the company especially if you move up position in the company'

The programme has been structured to make the transition from day release to flexible learning as smooth as possible. Discussion with the students identified some initial apprehension on their part but that they successfully made the transition without major difficulty. One student commented

'It's been pretty good contact, more than I expected. I was slightly concerned it would be put on the net and we would be forgotten about',

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and another said

'Is has been scary to start with – simply because we are so used to having one day a week input and now it's once a month if that. Once you get over the first hurdle or first assignment in this case it's sort of started to become the norm, I think it becoming a little bit easier and easier as we go through'

4.1.1 Face-to-face sessions

One of the key elements included to facilitate an effective transition to flexible learning are the face-to-face sessions. These are much appreciated by both students and tutors, and for a variety of reasons. When asked how valuable they found these sessions one student replied

'Initial one day face to face enables you to see the people who you are going to do the course with and that makes a different being able to put a face to a name. It gives that extra level of camaraderie you know the people you are going to be even though the majority of us knew each other before'

This 'humanising' effect was also evident between student and tutor in the following students' reflections

'you are just talking to a computer…..if you haven't come in and seen them and had a bit of banter really, and get to know someone you wouldn't feel as comfortable asking questions that you might need to ask'

'it's hard to get personality across by email but now you kind of know what those 2 guys and what they are going to be like talking to you on line'

This feeling comfortable was also highlighted by a tutors who said

'You get to know the students and they get to know you, they feel more comfortable asking questions, they feel more comfortable in sending emails.'

Not surprisingly the main benefit identified by the tutors of the face-to-face sessions, especially the initial one day session, was that they offered an opportunity to ensure that a workable foundation was laid in the 'essential basics' required for the students to succeed in their studies. Additionally one student commented that the face-to-face sessions help to bring into focus the fact that you are on a course and without them you would 'feel like you are left out in the cold' with no reason or 'drive' to do the work.

The students' and tutors' comments, along with the 100% attendance, indicate that these sessions are much appreciated and valued, and that as one tutor said 'the students made very good use of them'.

4.1.2 Discussion forums
Discussion forums

The other elements introduced to support the learning are the on-line discussion forums. One is a staff/student forum, in which both tutor and students actively participated, and the other a student/student forum which was designed to give students the opportunity to interact with their peers, without tutor input.

The forums are included to allow for distributed learners to learn from each other, both as far as the responses given by the tutor to questions asked and the reflections of their peers. When asked if they learnt anything from other peoples' questions posted on the forum one student reflected that

'It's the same as if you are in the classroom, it's trying to translate that classroom environment to online.'

Another student confirmed that it was 'definitely useful having that sort of discussion online'

An interesting advantage of online discussions over the traditional classroom discussion, identified by one student, was that questions could be asked when they arose rather than having to wait for the next classroom session, which in the case of day release could be a week later. This thought was further developed when a tutor commented that the on-line discussions resulted in the tutor having more contact with the students than in the traditional classroom. He suggested that in the traditional delivery mode a tutor will see the students for the duration of the lecture and then often not see them again until the following session, whereasas on-line the contact with the students can be of a more continuous nature.

Predominantly the forums were utilized in a question and answer format. Either the tutor would post a question and the students would respond or students would put questions to the tutor. The forums were set up so that all participants could read all contributions, engendering a collective and social learning environment. It was hoped that students would not only interact with the tutor but that a discussion between students would occur. Analysis of the discussion forum reveal that for the staff/student forums for every 2 postings made by the tutor there were just under 3 made by students.

This indicates that student discussion was taking place, however not to the degree that it was hoped. One tutor noted that it was evident that this was happening and commented that

> 'Sometimes before I got to answer it the others had answered what they thought, so there was discussion, it wasn't just - we have got to ask you. They were prepared to answer each other.'

It was revealed that the use of on-line discussion forums was by no means a 'natural' thing for the students to engage in. Comments such as 'Should use the forums more – we weren't used to using them' and 'Something we will move, grow into – didn't realise quite how useful' indicate that students may require some measure of initiation to 'get them up to speed'.

As with classroom discussion, where there will always be students who are comfortable with asking questions and making comments and also those who are very reticent, so it is to be expected that not all students will engage with on-line discussions as readily as each other. This was confirmed by a tutor's comment that

> 'a number of students who didn't post a lot did say they read them. One of them didn't particularly like typing things up but I know he read it a couple of time a week.'

Analysis of the use of the forums showed that the staff/student forums were used considerably more than the student/student forums. Both for the number of posts and for the number of distinct threads the ratio of usage was between 2:1 and 4:1 in favour of the staff/student forum. Also analysis of the content of the postings show that the staff/student forums were used predominantly for study content and assessment discussions whereas the student/student forums postings were extensively of an administrative nature.

4.2 Constructivist learning
~~Constructivist Learning~~

The focus group discussions with students and the interviews with tutors indicated that the flexible learning mode of programme delivery is meeting the set of pedagogical principles required for effective learning to occur. Full time employment in the Engineering industry is a prerequisite for acceptance on the programme, so all the students are learning within an authentic and real-world environment. This was confirmed by a tutors' comment that

> 'students were relating the topic to what they were doing (in their work), and that I found very useful. If you are sitting in a class …. they haven't got the time to reflect and to consider it in relation to what they are doing in practice.'

When asked what was the value of the forums another tutor commented that students get a comparison of how the theoretical constructs work in practice in different companies. Additionally he said it was valuable for the tutor also to see up-to-date application of the theoretical constructs.

Relevance to the learner is essential for effective learning. A student responded, when asked what they thought was good about flexible learning, that

> 'Another advantage is that you realise the relevance of the work you do day to day – that becomes a bit more useful whereas if you are just a student you just churn assignments out with no realisation of why you are doing it – it is more useful'

Constructivist learning depends on building on the learner's prior knowledge. Therefore to effectively facilitate learning the tutor must have some understanding of the students' prior knowledge. The initial one day face-to-face session offer a tutor the chance to gain this understanding and provide a

stable foundation on which future learning could be built. One tutor expressed the advantage of these sessions as being

'key because the first session was tying in different knowledge, different understandings - they all had different experiences so they couldn't really have gone in with it to start with – didn't know all the terminology in manufacturing at that level'

and another tutor commented that the initial face-to-face session was 'very important because this subject needs a good understanding of the fundamentals'

The use of on-line discussion forums allowed tutors to give formative feedback on set exercises and questions throughout the units of study, with the added advantage that all participants could learn from the feedback. Additionally the very nature of flexible learning encourages and requires students to become autonomous learners. When asked what was good about flexible learning one student replied

'the ability to fit it in when you can, basically – it does require a little bit of self-discipline to make sure you do it properly but at the same time you can fit it in when you need to'

By virtue of the delivery mode of this programme on-line tutors necessarily became facilitators of learning rather than instructors. One tutor thought the students' expectation for the programme would be to have good quality learning materials and be regularly supported alongside their learning materials at a time that suits them, and the students expressed their expectations as being

'some kind of online interface with backup from the lecturers and the availability to come and use the facilities'

and

'It's been pretty good contact, more than I expected. I was slightly concerned it would be put on the net and we would be forgotten about'

Although this programme is new and the present students are the first cohort, it is encouraging to note the students' satisfaction with what they have experienced, as shown in one students comment

'I think it is as close as it could be in most people's expectations, I don't think there is anybody who is disappointed with what we have done so far.'

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5 CONCLUSIONS

In the second step (submission of final paper and paper summary – deadline 25th May 2012) we will ask you to provide a full paper version (for publication) along with a separate paper summary (for publication in print) via the Conference Management System (CMS). . This version will address and changes required by the reviewers and will include author names and affiliationsOverall the introduction of the flexible learning MEng has been highly successful. Students appear to have made the transition from traditional part time day release mode of delivery to a largely online mode of delivery smoothly. The evaluation of the delivery of the first units would highlight the importance, as already evidenced in the literature of taking a constructivist approach to learning. The decision to operate a flexible rather than purely online . . delivery has been proven to be a good decision and has clearly assisted the transition in learning modes. Although this transition was generally a smooth process, some issues arose with understanding how to use discussion forums and also moving to a greater level of independence. The evidence suggests that the online discussion did facilitate appropriate learning, albeit students acknowledged they took time to adjust to using them. However, the interface for engaging with the discussion forums on my?? were a barrier to efficient networking.

In particular entry of new posting and use of mathematical terminology were indicated as issues. Additionally, students reported that they would have liked additional feedback as they were undertaking the assignments, they tended to only use face-to-face contact for this. Perhaps most notable is the reflection by academics that in fact this mode of delivery engendered a greater quantity of student contact than the traditional face to face delivery.

As ever there are always things to learn and modify and recommendations from the review include:

- Investigate alternative networking tools for ease and efficiency of use.
- Explore providing appropriate support for assignments in an on-line environment.
- Explore further improvements to counteracting the dehumanizing effect of on-line learning.
- Improve further the transition from part time day release to flexible learning.

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