A NEW DIGITAL LEARNING FRAMEWORK FOR BLENDING ON-CAMPUS CLASSES WITH SYNCHRONOUS AND ASYNCHRONOUS PROVISION

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Abstract: This paper discusses a pilot "hybrid" undergraduate Business Management module, which uses a virtual classroom platform to integrate synchronous contact and bespoke asynchronous material. The pilot aimed to achieve the following:

1) more flexible support for our undergraduate learners;

2) sustainable and reusable learning artefacts;

3) live online collaboration for deeper learning through "digital discussions";

4) a Digital Learning Framework embedded within a pedagogical theoretical framework.

We offer our experience of "making the blend", reviewing learner feedback and constructing a Digital Learning Framework which promotes Active Learning pedagogies. Online education has grown in popularity (Barber et al., 2013; Beetham and Sharpe, 2013) and the emergence of MOOC's has afforded a new paradigm and expanded reach for Higher Education Institutions (Zemsky, 2014). This course development responds both to the proliferation of distance learning courses (Knight, 2009) and to recent calls to provide a quality "hybrid" provision (Conole et al., 2010). In designing this technology-enhanced learning environment, we took into account pertinent examples from the plethora of published material on constructivist learning principles and e-learning theories. The resulting Digital Learning Framework aims to provide a valuable set of guidelines for practitioners who aim to align their use of digital approaches with constructivist pedagogical principles.

Keywords: Hybrid; technology-enhanced learning; digital learning framework; constructivist pedagogies.

ALIGNING TECHNOLOGY WITH PEDAGOGICAL APPROACHES

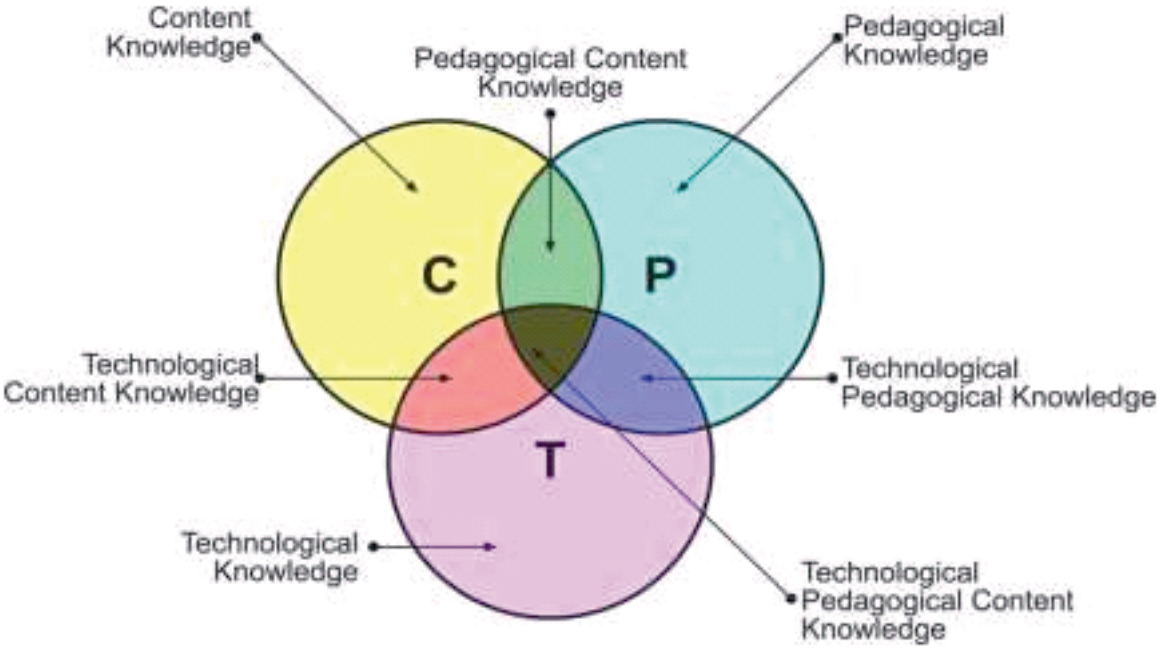
Land and Hannafin (2000) use the term "grounded instructional design" to designate "the deliberate alignment of core foundations and assumptions, and the linking of methods and approaches in ways that are consistent with their corresponding epistemological perspectives" (p.3) An implication of this epistemological alignment is that in using technology to support learning, course designers should consider how the technology supports their pedagogical approach: "In grounded design, the manner in which technology is utilized depends on its appropriateness to the particular epistemological assumptions of a given learning environment." (p.4)

It appears quite inevitable, that learners will come to expect their education will take place within technology-rich environments compatible with their mobile / tablet usage (Beetham, 2011; Shuler, 2009). From, a teacher perspective, it has also become clear that embedding digital technologies to support Higher Education learning environments by using a-synchronous virtual Learning Environments (VLE"s) and iPads has enabled a greater focus upon teacher inputs and learning outputs.

Supporting this notion is the Technological Pedagogical Content Knowledge (TPCK) conceptual framework Figure 1 (Koehler, Mishra and Yahya, 2007) which was designed to facilitate the process of embedding technology within the learning environment. The framework is designed to illustrate the interrelationships between the users, tools and practices, and underpins Koehler's view that "good teaching requires an understanding of how technology relates to pedagogy and learning content". With pedagogical practice in mind, it is not what technology can do (generally); it is the impact of this upon teaching and learning in the eyes of both teachers and students. Koehler, Mishra and Yahya (2007) focus on the „core" areas of knowledge: Content, Pedagogy and Technology. These core elements connect and interact with each other, in a dynamic and transformational equilibrium.

The role of the course designer is to select the appropriate balance between Content (C) (subject matter specific to the course), Technology (T) (e.g. digital devices, interactive materials stored in a VLE) and Pedagogy (P): (teaching, learning and assessment activities appropriate to the respective pedagogical approach).

Figure 1: *The Technological Pedagogical Content Knowledge (TPCK) conceptual framework (Koehler, Mishra and Yahya, 2007)*



The TPCK strongly supports the view that e-learning should not be seen as an adjunct or a new paradigm, but as an integral part of educational delivery closely aligned with the learning outcomes and pedagogical approach selected by the teacher. In order to achieve a close alignment between our pedagogical approach and our use of technology, we set out to construct a Digital Learning Framework (DLF) with the purpose of indicating how specific technological devices and systems can be used to enhance any learning environment. For the purposes of this paper, and since content knowledge depends critically on the specific subject knowledge and skills to be acquired in any given academic programme, we leave aside the question of content knowledge. In the following section we firstly explain the theoretical framework on which we base our pedagogical approaches, before going on to explain how we arrived at our DLF.

THEORETICAL FRAMEWORK

In our teaching at UoG, we incorporate Active Learning pedagogies based on constructivist principles (Duffy and Jonassen, 1992; Gergen, 1995; Savery and Duffy, 2001), which are usually contrasted with more traditional, teacher-centred or didactic pedagogies (Jonassen and Land, 2000; Meyers and Jones, 1993), which imply the transmission and recall of knowledge from teacher to individual students. Originally adopted in medical schools to train doctors to pose their own questions and develop problem-solving skills (West, 1966), constructivist pedagogies such as Problem-Based Learning, Inquiry-Based-Learning, Simulations etc. have been developed in many HE institutions, particularly in medical, engineering and business faculties in order to provide opportunities for learners to develop practical skills in open-ended and collaborative learning environments which are as close as possible to authentic working contexts.

In constructivism an important metaphor is that of the conversation or dialogue (Gergen, 1995), in which issues are discussed, meanings negotiated and decisions taken over strategies for further investigation. Active Learning pedagogies therefore involve students in actively shaping their learning experience. This conceptualisation contrasts with objectivist or didactic approaches, in which knowledge is transmitted between people, and in which the teacher's role is often seen as "delivering knowledge to the uninitiated". Active Learning pedagogies therefore underpin the design of courses in which collaborative learning can take place and in which students have opportunities for actively shaping their learning outcomes through interactive engagement.

AL pedagogies have serious implications for the role of the teacher, who is now seen as a "coordinator, facilitator, or resource adviser, that is, as one who enables students to marshal resources" (Gergen, 1995: 32). This diffusion of the authority of the teacher also requires the student to actively engage with the learning process and thereby, to some degree, to "establish the contours" (Gergen, 1995: 32) of their curriculum. For this new relationship to work successfully, it is important for both to be aware of the principles on which AL pedagogies are based. For example, Savery and Duffy (2001) show how the theoretical principles of constructivism can underpin course design, and propose Problem-Based-Learning (PBL) as one of the best examples of a constructivist learning environment. They base their constructivist pedagogy on three primary principles (in italics below):

1. Understanding is in our interactions with the environment. This is the principle that what is learned cannot be separated from how it is learned since learners are involved in constructing their knowledge.

2. Cognitive conflict or puzzlement is the stimulus for learning and determines the organisation and nature of what is learned. The principle of cognitive puzzlement is in stark contrast with the gradualist and atomistic view of learning typical of traditional didactic approaches, where learners are expected to master each item before going onto the next.

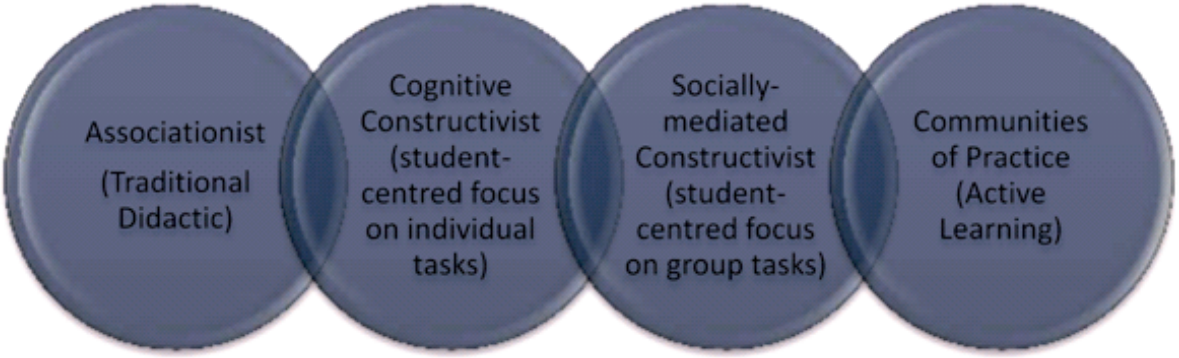
3. Knowledge evolves through social negotiation and through the evaluation of the viability of individual understandings. This principle stresses the importance of the social environment in the constructivist framework since in our search for viable interpretations of messy situations, we test our constructions against those of our co-learners.

The emphasis in constructivist course designs on maintaining the complexity of authentic working environments is contrasted by Spiro et al. (1992:57) with "traditional" learning environments, which are "unrealistically simplified and well-structured". Ill-structuredness can therefore be seen as a salient feature of Active Learning environments,

one which deliberately exposes students to the uncertainties supposedly found in the real world. Whilst acknowledging that there is considerable overlap between the two extremes and many intermediate positions, AL pedagogies might be usefully conceived as contrasting with traditional (didactic) pedagogies. In this way, traditional didactic pedagogies can be seen as based on a well-structured and pre- determined curriculum which is effectively transmitted by the teacher to the student. By contrast, AL pedagogies might be seen as based on an ill-structured and indeterminate curriculum which is facilitated by the teacher, but essentially negotiated among students.

Whilst we see constructivist learning principles as distinct from the more positivist principles often associated with traditional or didactic pedagogic approaches, we concede that, in practice, most successful classroom practices include a blend of approaches and that the various approaches should be seen as overlapping areas along a continuum rather than being mutually exclusive. We find the theoretical perspectives on learning noted by Mayes and de Freitas (2004) very useful and for clarification plot them (Figure 2) against a continuum of pedagogical approaches from Traditional Didactic to Active Learning.

Figure 2. *Learning Theories (based on Mayes and de Freitas, 2004)*



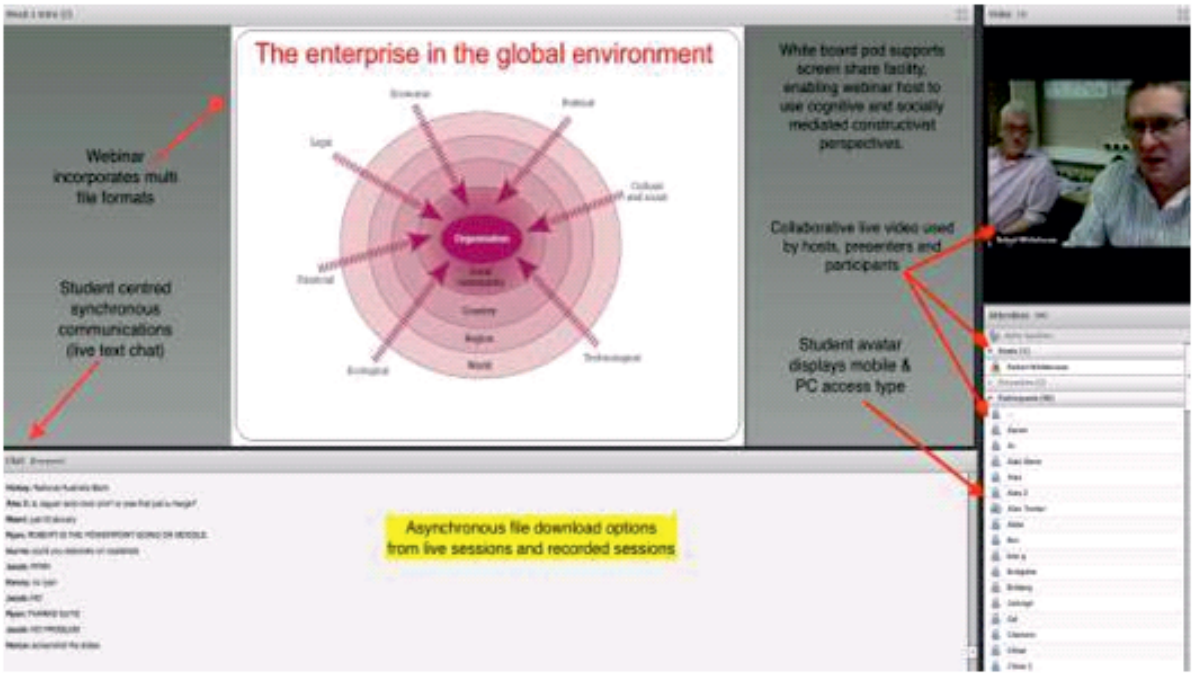
No claim is made here that these categories are either individually exclusive or collectively exhaustive, or that any single approach is always better than the others. However, as a heuristic, this framework helped us to design our classroom approaches with an emphasis on Active Learning pedagogies characterised by student ownership of learning, ill-structuredness of tasks, active discussion and authenticity (a focus on real world practice). Within the DLF we view Active Learning pedagogies as seamlessly combining elements of the other three in order to promote deep and reflective learning.

MAKING THE BLEND

Asynchronous content consumption through the VLE, is now a standard practice in many HE institutions (Knight, 2009) to provide supplementary static media support which students can access at any time of their choosing. Examples include storage of slides, articles and links to activities which students can access outside the classroom at a time of their choosing. On the other hand, synchronous content such as webinars use multi-user collaborative platforms and which students can access from anywhere at specific times. Including synchronous support in a predominately asynchronous environment requires a significant mind-shift and proved rather challenging at first both for us and our students.

Having selected a multi-user platform – Adobe Connect; to support one of our undergraduate Business Management modules (BM4115), we assumed that learners who had used FaceTime (Apple OS) and Skype (Microsoft) would be able to adapt to another peer-to-peer platform with few or no impeding issues. Upon reflection, we did not appreciate the impact of the formal learning environment, compared to the informal one-to-one (social media) relationship-based communications used frequently via smart phones. Since our learners were reticent in asking questions, in line with Rutter's research (2006) and joining group discussions (Richter 2011), we used live text chat (and screen share) to encourage and help overcome initial communication barriers and in order to assess the impact of this we analysed the student feedback, paying particular attention to the extent to which students felt the online tutorials had enhanced their learning experience.

Figure 3: *An online seminar using Adobe Connect*

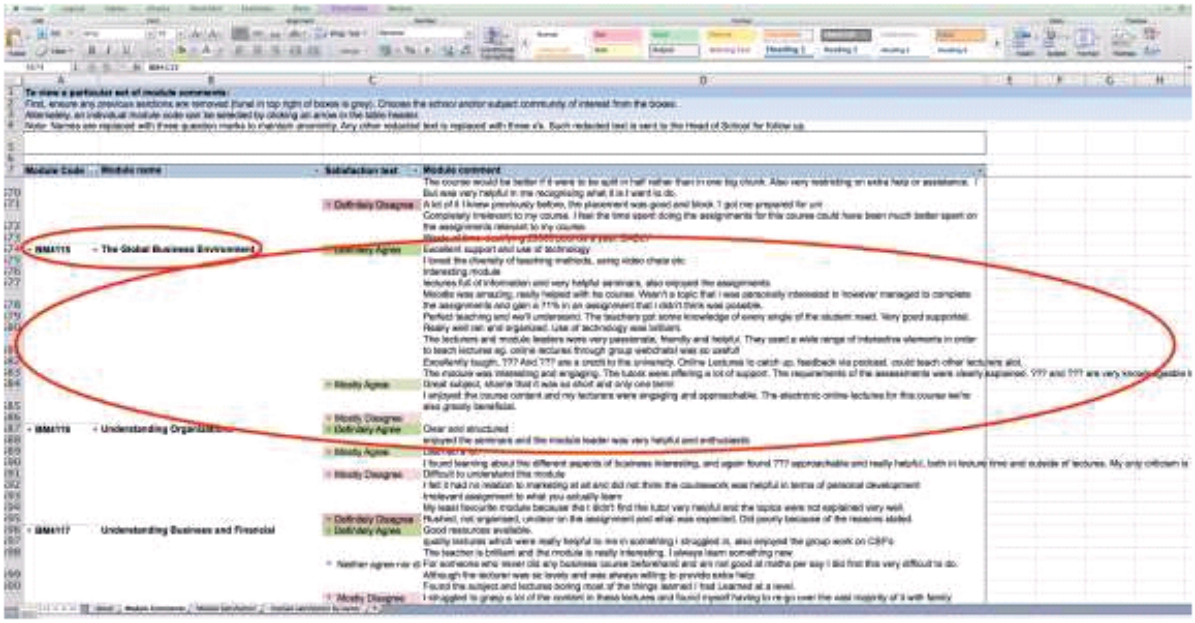


We also used Google Hangouts (Figure 4) to host 30- 40 minute individual or small group tutorials. Figure 4 illustrates an example of a live recording produced for department staff development „Bring and Share" day. It offers a selection of features of a Hangout session with two international learners.

Figure 4: *A Google Hangout session*

Creating efficient and useable asynchronous and synchronous pedagogies, has required much planning and research, particularly important when attempting to support learners whose first language is not English. Initial feedback from the research cohort included some pertinent examples, which helped in the construction of the framework and fundamental in scaffolding a robust design framework for the University of Gloucestershire's hybrid module design. Figure 5 offers formal evidence extracted from the Universities ACE (Annual Course Evaluation) survey conducted with the whole year cohort of students who studied BM4115 The Global Business Environment hybrid module.

Figure 5: *Examples of student feedback.*



Learner comments as highlighted in Figure 5 concur with feedback comments conducted at module level. Research candidates (2015/16 cohort) indicated that frequent live synchronous support (weekly 45 minute sessions) helped „maintain their engagement and momentum" in learning the module content. Students would often ask questions via the live text chat regarding the module assessment, feedback from the cohort suggests that this socially mediated (constructivist) method was particularly conducive in satisfying the concerns of the many, when answering the question posed by one member of the collective on-line cohort. The results support the findings of Koehler et al. (2007), and demonstrates that a focus on „how they learn" is just as imperative as „how we teach".

THE DIGITAL LEARNING FRAMEWORK (DLF)

The DLF (Figure 6) is designed to assist teachers in understanding how digital content and device applications can support their respective pedagogical approach.

Figure 6. *The Digital Learning Framework*

Theoretical perspective	**Pedagogic approach**	**Classroom activities (examples)**	**Technology Level**	**Digital materials and devices**
Communities of Practice	Active Learning	Ill-structured PBL and group tasks and simulations	Exemplar (Ideal mix of synchronous and asynchronous devices)	Any combination of the below
Socially-mediated Constructivist	Student- centred (focus on group tasks)	Students as producers: debates; well-structured team-based simulations	Depth-level (dispersed collaborative platforms)	Multi-user virtual environments e.g. collaborative blogs; live text chat; collaborative wikis and discussion forums; Mobile/tablet integration (pre-loaded content); peer review.
Cognitive Constructivist	Student-centred (focus on individual tasks)	Seminars and guided discussions;	Interactive media hosted on VLE	Bespoke content; Web 2.0 e.g. Kahoot, Socrative, Educreation; Screen-casting (live module handbook); prezi; Padlet; electronic voting systems; self-managed e-Portfolio e.g. Mahara; streamed video capture; digital stories; desktop publishing; self-assessment quizzes.

Associationist	Traditional didactic	Lecture; guided reading; guided audio-visual tasks	Repository (static media hosted on VLE)	VLE Pdf., Word and ppt. documents; links to 3rd party content; smart boards; audio recorded assessment feedback

The Repository level is baseline expectation for the digital generation and indicates the range of digital materials and devices which are often deemed appropriate even within traditional didactic learning environments. The DLF progresses through more interactive web 2.0 devices used in predominantly individualised student-centred learning environments, to the kinds of multi-user platforms used for collaborative and synchronous tasks where students may be required to produce re-usable learning artefacts through blogs, wikis and discussion forums. The Active Learning approaches such as PBL, EBL and simulations often aim to combine all of the above using an ideal mix of synchronous and asynchronous devices.

We based our DLF on the results of our own experience in incorporating technology into our courses, as well as looking at a range of published case studies (see appendix). This DLF forms the basis for a university-wide training artefact aimed at helping course designers in any discipline consider how best to align their technology use with their pedagogical approach.

CONCLUSION

On considering how to design a DLF, it is important not to assume that technology-enhanced learning is a new paradigm which challenges the pedagogical approaches currently in use. Rather, it is important to encourage course designers to consider how best align their technology use with their pedagogical approaches. For further investigation we would like to assess how this DLF is received by course designers across a range of subjects.

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