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A Learning, Research and Development Framework to Design for a 'Holistic' Learning Experience

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ABSTRACT The design of experiences and, in particular, educational experiences is a complex matter and involves not only using effective technologies and applying cognitive triggers, but there is a need to *think outside the box* in order to also design for the affective dimension of human experiences; the impressions, feelings and interactions that a learner might/could have with the online content and technology. The purpose of this article is to delve deep into this complex entity and, in doing so, to identify how one might approach designing for 'holistic' educational experiences. The article presents a case study describing the journey of a group of learning technologists and educators through the design and development phases of an action research online ABCD module, and it highlights the learner's experiences. It discusses the development of a learning, research and development framework to support the ABCD learning experience and, in particular, what was actually required to undertake the design for this learning experience. In summary, the article reports on a learning, research and development framework that provides solutions and support to a number of aspects involved in the design of holistic learning experiences and, in particular, the often neglected, yet complex, issues around experience design.

Introduction

As more and more new technologies are emerging in our everyday lives, they are not only influencing us in what they can do for us, or even what they can enable us to do, but they are also affecting our lives and the activities we perform more substantially. As Kevin Kelly (2010, p. 37) explains: 'as fast as we remake our tools, we remake ourselves. We are coevolving with our technology, and so we have become deeply dependent on it.' In fact, an increasing number of users are reaching a stage where they almost take for granted that these technologies will be efficient, effective and functional, and, instead, are starting to use these technologies to reinvent their identity and expect them to support their own creativity, individual feelings, social interactions and values (Carroll, 2010; Bax, 2011; Portman Daley, 2011). Moreover, it is argued that educational environments could be greatly enhanced by including social media and by moving in a similar direction (Kort et al, 2001). However, some technology observers also warn for the opposite – that social media and the overload of information they create might make our interactions less meaningful (Lanier, 2010; Turkle, 2011).

Nevertheless, virtual learning environments (VLEs), which were not that long ago seen as an efficient way to store and view learning content, might, with the emergence of the latest network

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technologies, be transformed into informal learning spaces and become the means to creating exciting, authentic and meaningful interactions and experiences, as network technologies afford for a shift in control from the educator to the learner (Siemens, 2008; Downes, 2009). However, in order to truly understand the potential of these online technologies for learning, one clearly needs to step up from the operational level and what it offers, to regard learners and their learning experiences holistically and consider different issues, such as their learning context, and how dimensions such as enjoyment, engagement, value, trust and loyalty, and social and cognitive presence, also affect the learning experience (Lombard & Ditton, 1997; Picard et al, 2004; Dron & Anderson, 2009).

This article explores the development of the ABCD learning experience and, in particular, what would be required to undertake the design to achieve this kind of enhanced learning experience. The article introduces a learning, research and development framework as a means to understanding the learning experience in its widest sense and how one might design for it.

Making Sense of the 'Holistic' Online Learning Experiences

> Computer technologies are not neutral – they are laden with human, cultural and social values. (Harper et al, 2008, p. 57)

For many years, the emphasis in the design and development of new technologies has been on usability and, particularly, efficiency considerations such as those involving objective performance criteria, time to learn, error rate and time to complete a task (Lavie & Tractinsky, 2004). Even now, within the spectrum of educational technologies, especially VLEs, the remit is still mainly focused on the development of efficient systems that will allow users to easily add and retrieve content, such as happens in learning management systems (Conole & Alevizou, 2010). However, as Hoffman & Krauss (2004) have pointed out, these developments have placed a high emphasis on performance issues and a low emphasis on the way users as learners experience them in use situations.

Research in more innovative systems is currently taking place (Dron & Anderson, 2009; Conole, 2010; Weller, 2010; Kop, 2011) with the emergence of Web 2.0 technologies and social media. In fact, it is only recently that designers and developers have started to pay attention to issues such as enjoyment, engagement, value, trust and loyalty, and acknowledge that these do have an impact on one's online activities and experiences. As Zimmerman (2003) points out, there is a growing acceptance that emotional responses to products and interfaces play a dramatic role in people's perception and evaluation of devices and services. In terms of learning design, the need to take affective issues into consideration when designing and developing e-learning applications was also emphasised in a recent study by Zaharias & Poylymenakou (2009). When we look at education, there is ongoing pedagogical research into the power of communication and collaboration as an engine for creating opportunities for effective learning (Kop, 2006; Gur & Wiley, 2007; Walton et al, 2008). However, it is acknowledged that issues such as enjoyment, engagement, motivation, trust and loyalty, and their potentials for communication and collaboration in education, still need to be further and more fully explored (O'Regan, 2003; Zaharias & Poylymenakou, 2009).

It is argued that human–computer interaction in the twenty-first century in relation to the field of learning technology needs to redefine itself. It should anticipate and shape the impact of technology rather than simply react to it (Harper et al, 2008). The user experience with technology is multifaceted and should be seen as referring to something larger than usability or one of its dimensions, such as satisfaction or attitude. The overall impression, feelings and interactions that a user has with a product or service means that design has become about creating experiences beyond just functional products and services, as indicated by McCarthy & Wright (2004). It is about creating products that encourage relationships with individuals; experiences that connect on an emotional and value level (Shedroff, 2009).

This means that in learning design, consideration should be given to how the technologies and their content can be designed and shaped to engage and connect individuals on not only a cognitive, but also an affective level. Terms like 'drawn in', 'involved' and 'enjoyed' will become more and more important descriptors for the online learning experience. Questions about people's

engagement with technology have led to conclusions that there is a need to create 'engaging' learning experiences which afford the notion of flow, 'the deep involvement in and effortless progression of the activity' (Csikszentmihalyi & Robinson, 1990, p. 7). However, even though there is evidence in the literature that positions emotion as having an important role in the teaching and learning process (O'Regan, 2003; Picard et al, 2004; Shen et al, 2009), designers are under pressure to produce a fast turnover of e-learning content and, as a result, the emphasis is not always on content to pull learners in and engage (Clothier & Taran, 2008), but rather on efficiency. Students who learn online spend much of their time looking at and using learning technologies, however, evidence is lacking to show that designers and developers of these technologies engage in a thinking process on how the learner's attention might be attracted and maintained throughout an online course, apart from the larger online institutions such as the Open University in the United Kingdom and Athabasca University in Canada. In order to create a holistic learning experience, consideration of learner engagement should be at the forefront of the designer's mind in order to enthuse and excite learners, and motivate them in taking control of their own online learning.

Keller's model of motivation in learning might be helpful, as highlighted in research by Jones & Issroff (2005), who emphasised four motivational dimensions: curiosity, challenge, confidence and control. Curiosity can be aroused by thoughtful design, while providing the learner with the right challenge in learning. But to challenge learners is more difficult as it means that a certain interest in the learner and his or her context is required in order to create an adaptation of what is being taught to what the learner already knows; informal tools might help to personalise the learning. Confidence is very much related to self-efficacy, as described by Bandura (2002), which could be enhanced by a careful matching of tasks with feedback and will also grow if challenges in learning are set at the level of student need. The level of control by the student and how the educator matches his or her support to the needs of the student is another important issue that requires consideration at a time when new technologies offer possibilities for self-directed learning and a high level of control by the learner (Kop & Bouchard, 2011).

Educationalists and learning technologists have philosophised on how the second wave of Internet technologies such as social media could be instrumental in moving towards a holistic personalised learning experience by moving from a hierarchical institutionally based teaching approach to a networked approach (Lankshear & Knobel, 2006; Wilson et al, 2006; Siemens, 2008). Social media would facilitate the transformation from an educational model that is structured in courses, controlled by the institution using a 'broadcasting' model in an enclosed environment, to a model adaptive to learners' needs, owned by individuals, while using an aggregation model in a personalised open learning environment, and a fluid extension of the wider informal personal space. Communication – which is important in forming affective relations – could be facilitated through the use of social software such as blogs and wikis, while information would be validated by others on the Internet through social bookmarking tools in addition to, for instance, micro-blogging tools, such as Twitter. Audio and video (communication) could be used to create a multisensory environment.

In the next section, we will describe a learning, research and development framework that draws upon our research and experience, and that of others, in creating personalised and holistic learning experiences. In particular, we will place a strong emphasis on the often neglected, yet complex, dimension of experience design and its role alongside areas such as instructional design, educational research, innovation development and methodology in the quest for the holistic learning experience. We were particularly interested in how the framework might support the embedding of social media in the design of the learning environment and, subsequently, if this were to add value to the learning experience.

The Learning, Research and Development Framework: research approach

How do we research the design and development of learning environments? A number of researchers in the field of learning technology, or as it is sometimes called 'educational technology', have chosen to use a design-based research approach (Bannan-Ritland, 2003; Barab & Squire, 2004; A. Kelly, 2004), which is sometimes also referred to as 'learning design' (Conole, 2010). At the heart of design-based research is a methodological approach that examines and analyses in a systematic

way every aspect of a new learning design innovation. From the moment the initial idea for the development is born, through an iterative process of development involving design and testing, to the dissemination, diffusion and adoption stage of the tested prototype of the designed environment, research takes place. Design-based researchers work with practitioners and designers to ensure that all aspects of the innovation in the process are scrutinised.

Figure 1 visualises our learning research and development framework, which has evolved from the integrative learning design framework by Bannan-Ritland (2003). It attempts not only to construct propositions about learning and teaching, but also to design and construct effective learning environments that allow educators and learners to make these propositions actionable (Bannan-Ritland, 2003). The framework has the added inspirations of both 'hard' and 'soft' systems thinking. If we compare our approach to those used in the implementation of a complete software system development lifecycle (SDLC), it has a strong synergy with the soft systems methodology (SSM; Checkland & Poulter, 2006), as SSM allows for and addresses complex real-problem situations in which known-to-be-desirable ends cannot be taken as given (Checkland, 1999). It would go too far to explain here in-depth what exactly this design methodology aspires to produce, but SSM affords many parallels with an educational and curricular development situation involving human beings from different disciplines and backgrounds, and our research and design framework resonates with this. It is clear from the way software is developed in the current climate of emergent technologies that change is no longer based on a static process defined by planning and systems requirements that are being built, but is more that of agile change based on a flow of iterative cycles of design, development and change, testing, adaptation and redesign.

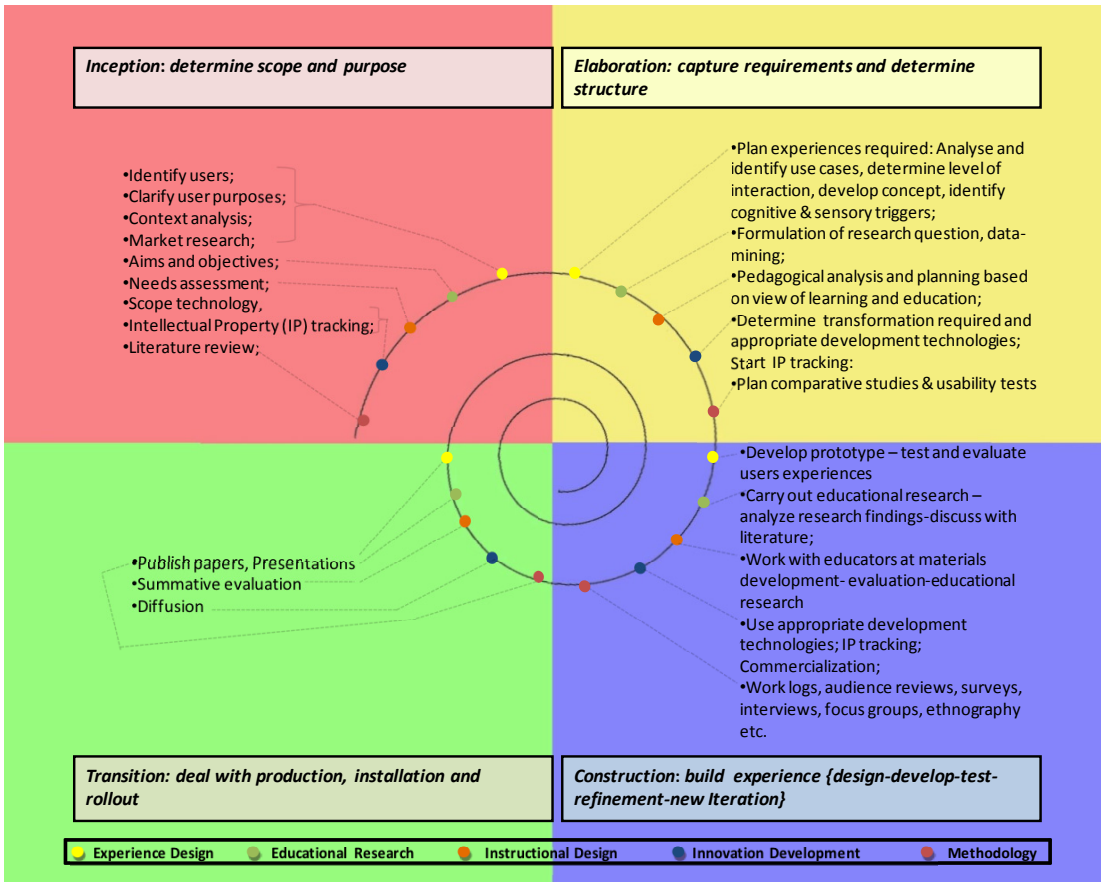

Figure 1. The learning, research and development framework.

This framework strives to combine the creativity of design communities with appropriate adherence to standards of quantitative and qualitative research and evaluation methods in education. It adopts a spiral model supporting a process that passes through a number of iterations.

This is divided into four main phases: inception (determining the scope and purpose of the programme); elaboration (capturing requirements and determining the structure of the programme); construction (building the experience); and transition (dealing with the production, installation and roll-out of the programme). These extensively cover the dimensions of experience design, educational research, instructional design, innovation development and methodology. As seen from the diagram, the framework places an equal importance on issues concerning the design of the experience (i.e. the learner and educator experiences) and how these could be represented by the designers, as in other forms of design.

The research and development framework was used as guidance in the research and development of the ABCD programme, which resulted in a case study. The case studied was a two-and-a-half-year-long project that had as its aim the development and delivery of an online programme in a university department of adult continuing education.

During the inception phase of the development, research took place before the ABCD learning environment was produced – for instance, in order to scrutinise the literature and to evaluate e-learning programmes with the target group, and to carry out a needs analysis, which resulted in a needs assessment document that identified possible participants and courses, and highlighted the aims and objectives of the course, the curriculum to be developed and the most suitable technologies to achieve the expected outcomes. In the elaboration phase, much discussion and thinking went into the planning of the experiences: the creation of multisensory experiences, the levels of interaction, and the reflection and communication loops required to achieve the holistic learning experiences. The construction phase initiated the production of the learning environment, where designers produced logs, and expert and audience reviews were carried out, while a prototype model was being developed. A high level of communication between the project manager, instructional designers, more technical specialists and educators was at the heart of the design and development phase. During this phase, learner experiences in earlier e-learning programmes were taken into consideration by the design team. After recruitment of students, they were involved in the next phase – the transition phase – where their experiences heavily influenced the subsequent design iterations and developments. The transition phase is the evaluation stage, where the usability of the design and the experience was tested. Observational data, interviews, focus groups and research reports formed the data. This was an iterative process in which testing, through data-mining of the Moodle environment, interviews with learners and educators, and help-desk and journal feedback loops, followed new developments and adaptations to the environment, which in their turn would lead to a new testing (i.e. data-mining, user interviews and feedback loops) and design cycle, and so on. In the final stage, the broad impact of the innovation was evaluated. This was done by data-mining, communication with other learning technologists at conferences, the participation of project staff and students in workshops, and interviews and observations.

During these four phases, close attention was being paid to how the activities were integrated in the design. One strand of the framework looked at the instructional design – the writing of the materials by educators – and how this interplayed with the design of the learning environment. Another followed the experience design – the use of social media to enhance the experience of educators and students – and included the incorporation of multiple media in order to engage all the learner's senses. Another, the methodology, explored the mechanics behind the step-by-step iterative process of tackling the needs of real learners in a real-world learning situation, and then innovation through to diffusion and adoption. The final strand involved the educational research, comprising observations and interviews of users and facilitators using the learning environment.

In order to put equal emphasis on the importance of the experience design, it was seen to be important to capture the learner and educator experiences in a holistic way, including affective and sensory aspects. Terry Mayes (2006) has emphasised the need not only to research issues related to the institutions and educators, but also to capture the learner perspective. His report on the LEX (Learning EXperience) project provided a convincing argument for choosing an alternative method to that used in the past for the research of e-learning:

> The mainstream approach reveals some influence of constructivist pedagogy, but largely neglects a genuinely learner-centred perspective: that students experience formal learning in

> emotional terms, that their motivation to learn is only understandable by looking at their lives holistically, and that technology is embedded in their social experiences. (Mayes, 2006, p. 3)

An ethnographic approach through the use of interpretative phenomenological analysis, as advocated by Mayes (2006), was used for the research in the case study in order to allow for the close examination of the experience of 10 learners and four educators as a sample of the participants involved in the programme. A deep understanding of different dimensions of the learning experiences was achieved through observing how participants used the learning environment and tools. Through interviews at different stages of the programme, it was possible to elicit preference for an educator-led or learner-led learning environment. By analysing the content of their blogs, wikis and discussion board participation, it was possible to closely examine their experience with social media for communication. In addition, a deep understanding of the educators' experiences was acquired. Analyses of statistics generated by the learning environment provided an overall picture of how often people used the learning environment and at what critical times.

In order to examine if the ABCD learning environment being used would influence the learning and teaching experience, the educators and learners were interviewed. In order to investigate the other strands – instructional design, educational research, innovation development and methodology – and the design of the learning environment, interviews with the project manager, educators, learners and the developers of the environment and resources were used at different stages of the programme. A developmental blog that archived the experiences of the design team at each stage of development, and the problems that they experienced in the process, was also used.

Construction: building the ABCD experience

The ABCD online higher education course [1] was executed in a Moodle open-source VLE. Moodle was used as it was more flexible than other learning management systems in use at the time and was developed to help educators create online courses with a focus on interaction and collaborative construction of content (Dougiamas & Taylor, 2003). However, like other VLEs, its very nature afforded some underlying limitations when it came to the actual design and structure of the content within the modules (i.e. designers were restricted to predefined structures and tools within the software package). Nevertheless, the fact that learning objects could be created outside a VLE structure and then added to the environment, as well as the reasonable versatility of the use of social media within Moodle, equipped the ABCD designers with sufficient means to apply the learning research and development framework and, in doing so, approach the issues of experience design, and hence the design of a 'holistic' ABCD environment.

This article focuses on the ABCD module 'Understanding Action Research'. The main drive was to create a place where both students and educators could easily and confidently come together to present, share and create new knowledge. In order to achieve this, the visual design or experience design of the place (i.e. colour, composition, etc.), its functionality or instructional design (i.e. its capabilities for communication, storage, expression and collaboration), its educational content or educational research (i.e. interactive, multimodal, dynamic and engaging content, etc.), the methodologies used to analyse the learning, and the innovation development all needed to work together as a whole to meet the main objectives of the module.

The framework allowed for a certain flexibility in the way the programme was developed. It entailed the development of a bespoke learning environment and the use of social media in an online adult education programme. The expectation was that educators would be encouraged to be facilitators, providing the tools for learning and signposting learners to resources, while the creation of activities that would encourage learners to direct their own inquiry-based learning was also incorporated in the plan. The learners would have access to a learning environment that they could personalise, where they would be more autonomous than in a traditional learning setting or while using the institutional VLE. Moreover, it was envisioned that they would be given the opportunity to direct their own learning by using Internet-based collaborative tools and online networks.

The first step in the construction phase was to integrate and align the strengths of both educators and learning technologists, such as their skills and knowledge. Regardless of their different backgrounds and expertise, the research showed that it was crucial to the design of the ABCD learning experience that all involved were working towards the most effective ways of understanding and delivering the content, including meeting all the learning objectives whilst creatively nurturing the learning experience. For this module, the focus was primarily on the strategic manipulation of the existing Moodle tools such as wiki and chat in order to encourage from students and educators an emotional connection, as well as to create a social and valued association between the learning and teaching experiences. Also, the emphasis was on the design and development of the learning objects – such as videos, flash movies, etc. – which would sit within the ABCD environment and be utilised to add a human and cultural level to the student–educator interaction. The following sections will demonstrate how the educators and learning technologists combined their skills to open up the online learning experience to consider emotional, social and human levels.

Chat and Mingling

The online chat tool was used frequently throughout the module to enhance learning and it offered students a synchronous text-based interaction to explore and share with the educators and other students their thoughts and feelings on the course subject. All online chats were in real time, but a limitation of the Moodle software meant that chats had to be pre-planned to ensure that all students were online at the same time. Nevertheless, the chat tool was strategically integrated into the module to work with the course content and was used once a week to extend the students' understanding of the subject area. Each chat adopted an informal guise, although they were carefully structured by the educators to ensure that each student had the flexibility to express, interact and explore ideas and experiences in a number of different ways. For example, it was used as a tool to help students and educators to get to know one another. In fact, as the findings show, a community of students and educators who at the start of the module did not know one another were, by the end, on nickname terms. Also, it was used as a way of clarifying the understanding of the material, to ask and answer questions, to highlight areas of importance, etc. In doing this, the chat room demonstrated huge potential in how it encouraged students to tease out information and create new understandings through the sharing process and encouragement by peers, and meant that all students, under the educators' guidance, could work together in disseminating material. The chat tool proved a successful way for the students to be themselves. As one student commented:

> I really did enjoy our online chats and I thought that Educator 1 and Educator 2 came across as very nice people. I did feel a bond with them and the students. It also helped that a few of us students have been doing the ABCD project from the start, so, by Module 4, started to get used to each other's ways and feelings.

The chat tool was a part of the module that students enjoyed and found useful when trying to enhance their learning. As one student remarked:

> I think, without the chat room, more of us students would feel detached from each other. I was also surprised and happy about the moral support from educators and students.

From the educators' perspective, it gave them the means to openly, honestly, critically and productively support their students.

In the chat room, the students and educators proved to be very comfortable with one another. They were engaging on a social level and this helped them to build relationships within their learning community. What was particularly interesting was how each educator and student developed their own voice by expressing their own thoughts, feelings and emotions, and, in doing so, engaging more in the content and, hence, the overall course.

Wiki and Collaboration

The wiki tool was also integrated into the action research module in order to encourage students to work together to untangle difficult concepts and tease out new knowledge and ideas. The real strength of the wiki was in its affordance of collaboration and the fact that the more people who became involved, the more interesting and potentially comprehensive the outcome. In this module, the wiki was interwoven into the main content in order to primarily encourage students to work together in collaboratively creating definitions, exploring complex issues and teasing out answers to questions posed by the educators. It was used to support the students, who autonomously produced content, whilst also having the confidence to amend, remove or change the existing information produced by others. This is evident in this student's comment:

> I do like the fact that, with the wiki, I get a little sort of light bulb that comes in from one of the other contributors that makes you think, 'Ah, I didn't consider that, but I'll think about it again'. Whether I add to the wiki myself depends, but it certainly helps my thought process.

In encouraging the participation in the wiki it gave students the opportunity to exercise and develop both their democratic and collaborative values.

Again, feeding into a greater understanding of the action research process, it can be said that the wiki has been successful in encouraging a sense of reflection and, hence, building a familiarisation and understanding amongst students of the dynamics and value of collaborative work. At times, however, unfamiliarity with the wiki 'rules' of collaboratively producing one document meant that, initially, some students felt uncomfortable with changing other people's work and chose instead to use the wiki as a discussion board, adding their own views, rather than critically interacting with the content produced by others. After some guidance by educators on the purpose of the wiki, this changed to the collective production of digital artefacts.

Reflective Blogs and Feedback

Blogs were used as reflective diaries, and students were very open and honest in what they wrote about their learning experience. The educators gave students personal feedback here, and some educators were particularly good at providing feedback. It was clear from observing the ABCD environment that the higher the number of interactions in the diary between student and educator, and the greater the intensity of these interactions and the quality of the educator's feedback, the higher the level of reflection, motivation and learner engagement (see Table I).

	Low-quality educator feedback in journal	High-quality educator feedback in journal
Low level of interactions in journal	Low level of reflection, motivation and learner engagement	Medium level of reflection, motivation and learner engagement
High level of interactions in journal	Medium level of reflection, motivation and learner engagement	High level of reflection, motivation and learner engagement

Table I. Relation between level of interactions and quality of feedback in journal.

The success of a journal depended on the use of the journal by the educator and student. Where high levels of interaction coincided with high-quality feedback, it was one of the most successful tools used on the course. The very personal communication between learner and educator that took place in the diaries showed the development of trust over the duration of the course. It was clear that the students' confidence levels and their knowledge and eagerness to participate increased not only because of the personal approach to feedback in the diaries, but also in the online chats and through videos. It was the combination of tools that created a sense of closeness between learners and educators, and it was only after confidence had grown that learners indicated to the educators that they could let go; that students felt they could cope with more autonomy.

The personal diaries were also the place for educators to find out if students needed additional support because people would disclose problems here, rather than in chats or on the discussion board, as it was a non-threatening environment. As this student's insight demonstrates:

> it was quite challenging and you don't ... you know, independently, you don't know whether you're making any sense or not. Then the educator comes back and says, 'Yes, you've got the point', and will give you another kind of perspective on it then. Then you feel like you're taking a step forward.

This shows that the students were benefiting from the strong educator presence in the journal. As another student highlights:

> they [educators] were constantly encouraging and giving us feed-back regularly on our journals and taking the positive side.

The journal was an important means for providing feedback and in doing so building up the student's understanding of the material and subject area. It was through reading the personal experiences of students, rather than the collective discussions through other tools, that educators decided to produce videos and include these on the learning place in order to clarify concepts, raise the level of confidence or lessen anxiety at particular moments in the course.

Video and Banter

Finally, video files were used as self-contained learning objects, which were integrated into the course structure and used to bring a human and cultural level to the student–educator interaction. Each video object was strategically designed to address a particular issue (i.e. ranging from an introduction of the educators taking the module to new and complicated topics, in addition to clarifying and confidence-building videos). The main objective was to provide an accessible way to help students overcome fears that invariably arise when faced with new material and ideas. As one student's attitude shows:

> if the technology is there and we have the option for videos ... and podcasts or whatever, then I think we should be using as many different things as possible. I suppose if I were to compare it to the senses – your eyes, ears, your speech, whatever – then we don't rely on one.

Consequently, these videos were intentionally unscripted and conversational, serving to portray educators as approachable and humanised, and helping students to connect on an emotional and social level, and, in doing so, to identify with the community of learning. As one student highlights, the educators'

> video presentations were fab. They were motivating, and encouraged you to be more positive about your approach as a student. It wasn't like in-yer-face close-up of one educator's head and them just monologuing to you. They were talking to each other, which was nice. You could sort of empathise and feel that you were part of it without being directly there, and take a lot out of it. So I liked that.

Indeed, from the students' feedback, the informal, yet very informative, nature of the video objects helped students connect on many important levels (i.e. each video centred on enhancing students' knowledge of a topic, but this was intertwined with humour and fun in order to engage not only the intellect, but also emotions). The videos also enabled the educators to register their presence on the ABCD environment and, in doing so, make the students' learning experience more meaningful and worthwhile.

Conclusion

From the feedback and final results of the ABCD students, it is clear that various degrees of learning and learning experiences occurred throughout the ABCD module. What the research highlights is not only the holistic nature of this learning experience and the encouragement of learning through individual intellectual simulation, but also the encouragement of learning through other emotional and social levels (i.e. the cracking and sharing of jokes on video; the

bonding and sharing of thoughts and feelings during informal chats; the reflection on and running of ideas past the wiki group, etc.). Importantly, it also documents the role of a learning, research and development framework in creating this holistic learning experience – a framework that placed strong emphasis on the design of experiences, as well as on educational research, instructional design, innovation development and methodology, to mould Moodle and integrate social media in a creative and imaginative way in order to ensure all dimensions of the learning experiences were addressed. As educational technologies advance, both educators and designers will face more and more challenges when reconciling the complexity and diversity of subject and tools with a sufficient clarity that caters for all levels of the learning experience. The use of a learning, research and development framework can provide the right foundations to strategically guide and support both educators and designers from the inception to the elaboration, construction and transition phases of a holistic learning experience.

Therefore, in many ways, this article is advocating a broader online educative framework that takes on board the intellectual, emotional and social levels of learning. The future of online learning can only lie in this bigger picture. Communication tools and multimodal interactions can add to the design of experiences and, in doing so, help create the holistic learning experience. This can contribute to engaging learners in a progression that involves something more than merely using technology for effective delivery of content. It entices learners into active engagement with this content. Emergent technologies can enable and support affective engagement, but the design and development process needs to be carefully planned to consider not only instructional design, but also experience and user-centred design, and to include these in its iterative cycles.

Note

[1] The ABCD project, 'Technology, Research and Innovation', was a programme funded by the European Social Fund for people who were 'underemployed' in small, medium and social enterprises in South Wales (2006-08). It was initiated by the Department of Adult Continuing Education at Swansea University, United Kingdom, and was a higher education course that was put online to accommodate students (i.e. workers) who could not feasibly follow a more traditional-style classroom-based course. It included a range of modules, such as: 'Information Literacy and Critical Thinking', 'Reflection, Innovation and Creativity' and 'Understanding Action Research'.

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