Chapter 1: Designing Blended Learning—"Designing Blended Learning: Transformative Scenarios for the Millennial Learner"

Karen Le Rossignol

Introduction

This chapter explores the key elements involved in designing blended learning within virtual learning environments and the work-integrated learning context for higher education students. These twenty first century millennial learners are digitally literate and mobile, flexible and socially collaborative in their approach to learning. They also have high expectations that what they learn will be relevant to what they will need in the workplace.

The key elements for designing their learning are centred around a pedagogy and curriculum appropriate to 'shape-shifting portfolio people' (Gee in Kalantzis et al 2002, p75). The blend of learning arising from a well-designed curriculum will encourage their capacity to manage change. The curriculum will support a learner-centred design developing resilient identities and networks, and the building of collaborative communities to support lifelong social learning.

Blended learning, within the context of this chapter, assumes an interactivity based on a learner-centred approach which asks learners to be active rather than passive. There is an engagement from the learner in the process. There is also the potential to shape the resources and approaches to the needs of the learner, to match their learning styles or approaches to the process of learning. This is more than e-learning, as it is a transformative process encapsulating the skills of the designer, the learner, the facilitator and the tools across the appropriate blend.

The development of the transformative and immersive scenarios which are illustrated by the case studies in this chapter identifies the relevance of exploring the blend of both the relevant and suitable medias and the learning styles and collaborative capacities of the twenty first century learner.

Blended Learning and its Transformative Design

Blended learning refers to the combination of a range of connections between the digital media environment and the twenty first century learner. Examples of

blended learning include the integration of traditional learning with web-based online resources; the combination of media and tools within an e-learning environment; or the combination of a number of pedagogic approaches, not dependent on learning technologies (Oliver and Trigwell, 2005). The pedagogy incorporating a learner-centred approach, with a curriculum which is transformative in intent, provides discovery learning, with students constructing their knowledge as autonomous learners.

John Dewey, as early as 1916 in *Democracy and Education*, argued for education and learning as being social and interactive, with learners able to prosper and engage with the environment where they experience and have some control over the curriculum. Learners will attach content to prior experiences, which will then more fully engage them with the new knowledge they are being asked to absorb. He stated, 'if knowledge comes from the impressions made upon us by natural objects, it is impossible to procure knowledge without the use of objects which impress the mind' (Dewey, 1916/2009, p. 217-218). Doll (Doll and Gough, 2002) positions Dewey's vision as a 'transformation or reconstruction of experience' (p.38). Dewey's educational view, according to Doll, is of emergent curriculum rather than imposed controls. Adapting Dewey's theory of a continual, ongoing transformative process to a postmodern perspective, Doll envisages a curriculum where transformation and open-endedness should be the rule, rather than a set or prescribed course (Doll and Gough, 2002).

One of the pedagogical outcomes of Dewey's theory, Problem-based Learning (PBL), reinforces an interest in active learning approaches. Barrows (1996) defines the Problem-based Learning model as being student-centred, in small groups, with facilitators who guide rather than teach, problems which focus the group's learning to stimulate the cognitive process, and new knowledge through self-directed learning. PBL is grounded in the principle of a simulated real world and professional context. This is coming from a constructivist perspective on learning. The instructor is a guide who challenges the learning process, rather than assuming and enforcing the role of knowledge provider. Therefore two vital elements in this PBL model are feedback and reflection related to the learning, and group dynamics. Learners are active in constructing their social knowledge, through personal interpretations of the worldview of their experiences and interactions. PBL is intended to move the learner through theory to practice in solving the knowledge problem/s (eg Edens, 2000). This provides a strong pedagogy for designing mediated immersion in virtual worlds and work-integrated learning projects for a mixed group of learners.

The ability to be adaptable, and able to change with the requirements of their careers, is an important attribute for the graduate of the twenty first century. Transformation in learning is also potentially about transforming the learning space, or the knowledge space as an academic framework. A movement to performativity matches well with the movement away from internalized, individualistic learning theory, as the educational technologies encourage connected, socially adept networks and collaborations within workplace/industry contexts.

Blending through Constructivist Pedagogy

Constructivist pedagogy emphasizes the individual agency, where learners construct their own meaning building on previous experience. Constructivism as a general approach indicates a form of active learning which develops knowledge through experience. Experiential learning is, as Kolb (1983) has stated, '… the process whereby knowledge is created through the transformation of experience' (p. 41). The experiential learning model of Kolb combines concrete experience with reflection, conceptualization and active experimentation, in a constant cycle which synthesizes experience, reflection and theory. Each iteration of this learning cycle increases knowledge and practice through deeper understanding. According to Silberman (2007), experiential learning incorporates a direct involvement at emotional and intellectual levels, using projects or work-based activities that are very similar to or replicate workplace experiences. This transformative experience potentially requires immersive and imaginative simulations and situations to bring the learning closer to the day-to-day workplace experiences, particularly in aspects such as interpersonal skills and communications.

Current trends in learning have developed from constructivist viewpoint roles such as student-centred learning, teacher as facilitator, discovery, collaborative, project-based, and task-based learning. Taking this into a more socially-based community of learning environment, pedagogies derived from theories of social constructivism grew from constructivism to use social settings for groups to collaboratively create shared artefacts with the same meaning. By sharing each person's point of view, there is a greater capacity for learners to build knowledge that might not be possible alone.

It is interesting to examine the learning environment from a constructivist perspective when designing blended learning. Jonassen (1994) proposed seven characteristics that differentiate constructivist learning environments. These include environments which provide multiple representations of reality, presenting the complexity of the real world. The environments focus on knowledge construction using authentic tasks within a meaningful context. There is also a focus on real-world or case-based settings with reflection on experiencing those worlds or cases. The focus is on collaborative construction of knowledge through social negotiation rather than competition among learners for recognition. The seven characteristics as listed below have been utilised by H.R. Neale et al (1999) as an evaluative framework for a virtual learning environment:

1. Represent the natural complexity of the real world.
2. Focus on knowledge construction, not reproduction.
3. Present authentic tasks.
4. Use case-based rather than predetermined sequences.
5. Foster reflective practice.
6. Enable context-dependent knowledge.
7. Support collaboration through social negotiation.

This constructivist-based collaborative learning encourages learners to become more independent and internalize their learning. It is an interactive model, encouraging and promoting discussion both in formal training formats and

amongst peers in teams and collaborations. The facilitator's role also requires a development of trust and relationships with the learners, modeling professional values and ethical dimensions within the content (Carlile and Jordan, 2005).

Constructivist-based pedagogy may even be moving towards connectivism as a blended approach. The ability to synthesise and recognize patterns and connections is a valuable skill within an experiential or work-oriented learning environment. The principles of connectivism, according to Siemens (2004), relate to developing learning processes for connecting specialized nodes or information sources, encouraging learning and knowledge in a diversity of opinions and developing the capacity to know more rather than focus on what is known. The nurturing and maintaining of connections will facilitate continual learning, and enable the ability to see connections between fields, ideas and concepts. To be current, to have accurate, up-to-date and timely knowledge is the aim of the connectivist approach. This seems to find an interesting match with the millennial learner and higher education needs to develop capacity and opportunity to connect in lateral and layered ways. This may not necessarily be a separate theoretical model, but an extension of social constructivism into digital modes. The key focus for connectivism is the individual and their personal network. Learning is no longer an internal, individualistic activity because of the impact of the new learning tools and environmental changes in what it means to learn. Thus the learning space is also changing into a more connectivist model which is not constrained by traditional narrativity in its knowledge transfer. It is potentially mobile, more strongly collaborative, with a flexible design.

With the millennial learner comes an increased connectedness of community and collaboration. There is also a growing trend towards increased authenticity and on-demand learning, with strong links between working and learning. These trends indicate that there are changes in instructor/mentor roles, with abilities to take on multiple teaching and learning environments, such as coaching and mentoring, as well as instruction or skills delivery. Group problem-solving and collaborative tasks leading to hands-on learning activities with a strong experiential focus are the challenges for e-learning blended approaches.

> In the future it will be more widely recognized that the learning comes not from the design of learning content but in how it is used. Most e-learning theorists are already there, and are exploring how learning content - whether professionally authored or created by students - can be used as the basis for learning activities rather than the conduit for learning content.
>
> (Downes, 2005, http://elearnmag.acm.org/featured.cfm?aid=1104968).

Returning to blended learning and its definition within these constructivist/connectivist frameworks, Valiathan (Valiathan 2002) describes blends in terms of the focus for learning. This includes skill-driven learning, where the self-paced learning combines with instructor or facilitator support to develop specific knowledge and skills. Another learner-based approach is attitude-driven learning, which mixes various events and delivery media to develop specific behaviours. One of the most common learner-based approaches

in Technical and Further Education (TAFE) in Australia is competency-based learning, which blends performance support tools with resources and mentoring or coaching, and is very strongly linked to workplace skills acquisition.

For the instructional designer or educationalist, it is important to consider how to use e-learning resources, how to combine online with face-to-face, and most importantly, to define what will motivate the learner. The mix of learning resources and approaches available and accessible to the instructional designer is certainly confronting, with at least two, or maybe up to five or six components required, according to organisational training consultant Josh Bersin (Bersin, 2003). The components can be grouped into the interactive, tutor or mentor-led delivery approaches such as classroom instruction and live virtual classes, webinars or conference calls. Another component area is the courseware that may include web-based sites, simulations or portals, or even simply the text-based materials.

Clark (2006) discusses these components as a range of online and offline approaches. Offline may include workplace learning, a classroom or teaching space with face-to-face tutor/coach/mentor, distributable print or electronic or broadcast media. Online content includes strategies of e-tutoring, e-coaching or e-mentoring, developing an online collaborative learning unit through such aspects as web access or mobile learning.

Both Clark and Bersin are talking about the mix, how to best approach the modern digital or millennial learner with relevant instructional technology, using proven pedagogies.

The Millennial Learner

It is even more useful to approach the blended learning from the point of view of the learner, to establish what will engage and motivate. The digitally literate millennial learners of the twenty first century are generally considered to be the generation born 1980-2000 (see for example Arnspager 2008). According to Arnspager (2008), they are connected to friends, parents, information and entertainment, with a technological experience that links them to a global worldview. They have the ability to multitask, and are goal and achievement oriented. These millennial learners are also connected and experiential in their learning (Oblinger 2008) and have strong social networks through online areas such as MySpace, Facebook and Flickr. They are participatory in their communities. They have grown and learned surrounded by digital media.

For the millennial learner, the learning environment is seen as a participatory culture, with a sense of collective intelligence – everyone has something to contribute. The millennial learner sees experiences as more important than the acquisition of information (Oblinger 2008). The learner-centred approach requires knowing the expectations of the learner, and building into the blend of learning design methods that allow an environment for learners to make mistakes and correct them (a form of active problem solving). The strong engagement can be developed by engaging multiple senses creatively across multiple medias.

There is an additional complexity for the instructional design educator, which requires usage of the mobile technology in the way the net generation or millennial learners (Tapscott 1998) use it, as opposed to the baby boomers who

may be designing the program. Blending learning needs also to consider a student profile where they are connected to each other (and mobile), and proficient in communicative technology (and use it as a matter of course).

Neomillennial Learning Styles

Identification of millennial learning approaches has led to the exploration of the implications of Chris Dede's work on neomillennial learning styles, and his championing of mediated immersion. Dede (2005) describes immersion as participating in a comprehensive and realistic experience. Immersion incorporates mediation (an expert guide) to develop reflection, and to identify the importance of transfer. Transfer is also strongly linked to work-based or problem-based learning, provision of authentic work settings within which to transfer the learning. Dede (2005) puts forward media-based neomillennial learning styles to match these immersions within experiential learning.

Dede believes the learning styles incorporate:

- Fluency in multiple media and in simulation-based virtual settings
- Communal learning involving diverse, tacit, situated experience, with knowledge distributed across a community and a context as well as within an individual
- A balance among experiential learning, guided mentoring, and collective reflection
- Expression through nonlinear, associational webs of representations
- Co-design of learning experiences personalized to individual needs and preferences.

(Educause Quarterly, Vol 28 No 1 2005)

Thus a blended approach to the millennial learner needs to consider three aspects very strongly: a balance between experiential learning, guided mentoring and collective reflection; developing nonlinear and associational links in resources; co-design of experiences which match individual needs and preferences. Blending learning, within this framework, requires a very strong integration of the media with its purpose, and its relationship to the learner and mentor. Dede argues that millennials' education is shaped by 'learning based on seeking, sieving, and synthesizing, rather than on assimilating a single "validated" source of knowledge as from books, television, or a professor's lectures' (Dede, Educause Quarterly, Vol 28 No 1 2005).

The case studies which follow pick up the threads of the blend most appropriate to the millennial (or perhaps neomillennial) learner, and illustrate a range of approaches which have met the perceived need for a learning community which is digitally media literate, incorporating a guide or mentor and collective reflection. They are also creative approaches which attempt to engage the learner in action-based or problem solving learning.

Case Study 1: Building Creative Teams

This case study is an example of an experiential work-based project. The postgraduate coursework unit *Building Creative Teams* has had as its major assessment task over four years the event management of a creative arts festival for undergraduate third year students. This is a six week festival with a big opening night/launch, for which these postgraduate students were responsible. The skills being developed focused on arts project management and planning, with teamwork being the major learning area.

Each year this class group contained an age range, usually 22 to 35 years old, displaying new media literacy in their technologies as communication tools. They came from a range of different countries and learning approaches. The countries represented include Thailand, China, Uzbekhistan, Norway, Indonesia, India, Sri Lanka, Malaysia and Australia. Their expectations were varied at commencement of the unit, and part of the strength of this approach to learning was to ensure one of their expectations was to develop skills in working in the four teams proposed. They were required to negotiate with a client, the marketing manager of the faculty at the university, and the creative community of performing arts students and staff. The end products included the launch, an e-newsletter and promotional website, the archives and a multimedia record of the live work process which could be used to brief the next year's students. They were studying in the framework of the Master of Communication, a program which allows a broad selection of study (and therefore an eclectic mix of skills) within the streams of public relations, advertising, journalism, media (film/video/photography) and professional creative writing.

The four project teams were established using a range of learning styles and project management tools/questionnaires, within a quasi-business/workplace environment. The classes were held in a creative studio environment, echoing as much as possible that workplace environment. An example of a useful learning styles tool was the Honey and Mumford Learning Styles Questionnaire: this questionnaire indicates four learning approaches within which learners (and in this case team members) operate comfortably – activist, reflector, pragmatist and theorist (see http://www.peterhoney.com for details on the LSQ and interpretations of individual types). For teamwork, the Belbin Self Perception Inventory identifies nine roles and describes how each contributes to a team. Most people operate within three to four team roles, and these can be adapted depending on the situation. Check the website (http://www.belbin.com) for details on the nine team roles. These tools and a skills audit of the group conducted by the facilitator/lecturer, the 'managing director' of the experiential learning project, provided the basis for selecting teams.

The teams were deliberately set up with a mix of skills and backgrounds, learning styles and management or leadership qualities, including quite divergent English language skills. In fact, the teams set up - which were guaranteed to have friction, to test their abilities to work together – had a very strong risk factor of failure. The project was depending on and exploring the use of different media as the communication 'glue' – initially the learning management platform, eventually the wireless, portable and speedy response media alternatives the students turned to. There was also risk minimisation through the use of an experienced educator/project manager/mentor, taking on the role of 'managing

director' of this workplace-oriented 'consultancy agency'. Most of all the learning was based around its experiential context – the live work project and its workplace-oriented pressure to commit to the outcomes. These would become the drivers of the learning, rather than the information in print and online, or the educational 'expert' or authority.

Each of the four teams was fluent and self-directed in moving between multiple medias, focused on what they could achieve with the alternatives. Many reflected rigorously on the powerful learning achieved by the blending of face-to-face and media-related communications in emergency situations.

Although there were many in the group who had come from traditional teacher-directed learning models, they adapted almost instantly to collective sharing of experiences to pool their information. Whether it was in skills or knowledge-based learning areas, they were comfortable in using the team as a learning tool. The print materials (useful readings, weblinks and resources, learning activities) were utilised by the students in exactly the same way as the learning from the team – one of the sources when events became difficult and required strategies.

Each year, the sense of excitement at working with a live project lasted the length of the project, despite mixed success in achieving the outcomes. It was leavened with realistic reflection after the launch event, in a classic action learning approach. The teams were all learning immersively about group dynamics and team learning models, incorporating presentations as assessments which analysed the project outcomes as much as they demonstrated teamwork/project management learning.

There were regular opportunities for reflection, both in individual surveys and in public team and individual presentations. The comparison to print-based scenarios for team presentations used in this unit from previous years indicates a greatly increased applied learning of the key interpersonal skills – for example, problem-solving, negotiating, mediating between different skill sets. The planning and team management strategies were also used on a needs basis with the live work project, so discussion of their validity was infused with applied knowledge and enriched reflection on the situated learning.

The achievements and reflections indicated that the launch each year was successful, although there were issues identified and passed on to the next year's team. Above all, the teams were able to maturely and publicly analyse and evaluate the successes and failure, including in the area of socially difficult issues of language and culture within each team.

It was learning ...'sometimes... face-to-face, but sometimes ...distributed across time, space and media' (Dede, 2005), as Dede has affirmed, a very blended range of facilitation methods, learning styles, resource formats and expertise.

Case Study 2: Writing for Communication Media—*Newlandia* Scenario

For this postgraduate unit or subject in the coursework Master of Communication, there are both face-to-face and online groups. The face-to-face group is a mix of international and local students, similar to the previous case study cohort, except that the group is bigger. The online cohort comes from Australian government

and corporate locations, and a small number of international students. Total numbers have averaged about 25 to 30 in face-to-face, 55 in online/off campus mode. Learners were given open choice on delivery options (although international students are only allowed to take one online unit in their degrees because of visa requirements).

This is a professional or work-based writing unit, with learning focused on extending student capacities to change their writing style and approach depending on audience and purpose across reports, persuasive social advocacy and extended research essays. The first two areas focus particularly on a virtual world scenario.

The scenario is centred on the island of *Newlandia* which has a water problem and two organisations trying to solve it – the *Newlandia Business Development Authority,* and *Newlandia Environment Council.* There are several outcomes for the students to achieve – a letter to the editor (of one of the island papers), a media release, a news story or interview profile of the leaders of each organisation, a report. The aim is to advocate successfully by changing styles and formats for each task, and defining carefully the audience and purpose. Students take on work roles in one of the two organisations, and discuss approaches collaboratively, then develop individual responses. This unit previously utilised a print-based outline and some photos, with mixed success. Since 2007 the scenario has been a fully web-based island simulation, with animations, audio and video used as breaking news triggers on a weekly basis.

In 2008, statistics taken from the learning management platform's site for this unit revealed that there is a strong engagement with the *Newlandia* scenario. Figure 1 below indicates the high percentage of time taken in visits to the Newlandia site, averaging 11 minutes per visit, particularly in comparison to the Home Page, Unit Resources and Unit Guide sites which are key information sources and therefore regularly visited.

Item	Visits	Av Time per Visit	Total Time	% of Visits
Writing for Communication Media	131980	15:00:10	1294:06:04	100.00%
Newlandia	1873	0:11:11	349:11:40	26.98%
Home Page	6902	0:00:48	92:08:12	7.12%
Unit Resources	2418	0:00:26	17:44:26	1.37%
UnitGuide	213	0:03:44	13:17:00	1.03%

Figure 1: Deakin Studies Online: Writing for Communication Media Usage Statistics retrieved June 2008

Conclusions

Students anecdotally supported the statistics. Some comments from the student evaluations, responding to the question *What were the best aspects of your unit?* indicated that the scenario was not bogged down by theory, but enabled an imaginative approach. It kept the subject really interesting, and students found the issues easier to research. The sense of a workplace orientation enabled production of realistic communication materials used outside of a university setting. The scenario was well built and engaging, enabling creative approaches. Feedback indicated that it was so involving, it was hard to cut ties with the world created by the combination of the website and the writing tasks which grew from that world.

Case Study 3: Writing for Professional Practice—Undergraduates and *Bilby*

An undergraduate writing unit used the technical framework of *Newlandia* and reconstructed it graphically and creatively as an Australian country town, *Bilby*.

This is part of a unit called *Writing for Professional Practice*, which is recommended as a first year experience or introductory unit for commencing students. It is offered across three campuses and online across the academic year, and has grown to approximately 800 students per year. They are in a range of degrees: arts generalist, international studies, media and communication, professional and creative writing, public relations, primary and secondary education, health and behavioural science/sports management, business and law.

The virtual world of *Bilby* is used to engage learners imaginatively in the tasks of report writing, news items/interview profiles, media releases and web-based promotional writing. Over five weeks, *Bilby* becomes the focus of research as students take roles in a lobby group – *Bilby Landcare, Bilby Business Association* or *Bilby Historical Society*. They become a part of the town and write from that point of view, so their audience and purpose is clear to them.

Bilby is full of stories. The current point of dispute is that the town has grown too fast (9000 – 19,000 in five years) and needs a new hospital. The Shire Council, in its wisdom, has stated it will be built on the old graveyard at the edge of town. This threatens the habitat of several endangered species (specifically the growling grassfrog) and the historical sensitivities of elements of the population.

Each week's catalyst to develop a writing task is a media-based Breaking News segment. There is potential for this to be uploaded as part of the Shire Council's latest Media Release slot, or as a podcast in the local community radio station area. *Bilby* is currently developing two new storylines, one of which involves a global wind farm corporation which has international links to social enterprises and a somewhat muddy reputation. This is targeted to the undergraduate International Studies program, which wants to prepare its students for an international study abroad internship and its attendant writing tasks. The second storyline concerns a local fitness and community centre, and is targeted to an undergraduate degree in health sciences. The possibilities to enlarge the stories within *Bilby* are relatively unlimited, as the characters and plot can be superimposed on this country town.

In comparison with the postgraduate unit in the case study above, in 2008 the learning management site provided some interesting measurements of time taken to explore the scenario. In Figure 2 below, *Bilby* scored 26.66% of the time taken in visiting the Unit's site, with an average time of 15 minutes. This compared with, for instance, the home page, where everyone accessed the information and resources provided, and the Unit resources where there were many different notes and weblinks to explore. The Unit resources, in contrast to *Bilby*, were not being accessed to the same level.

Item	Visits	Av Time per Visit	Total Time	% of Visits
Writing for Professional Practice	196398	12:45:25	1660:01:43	100.00%
Bilby	1766	0:15:02	442:38:30	26.66%
Home Page	13453	0:00:38	142:45:46	8.60%
Unit Resources	8625	0:00:29	70:26:57	4.24%
Unit Guide	227	0:03:08	11:53:20	0.72%

Figure 2: Deakin Studies Online: Writing for Professional Practice Usage statistics Retrieved June 2008

This subject has been delivered since 2000, with the virtual world scenario developed in 2005, and its capacity to extend and remain relevant via its stories, characters and plots ensures it is as relevant today. The technology is simple, a website which can be augmented by uncomplicated media files, and it can sustain large numbers accessing it at the one time. New undergraduates find the storylines playful yet believable, with the context for their writing tasks being related to community issues they recognise and which are therefore accessible to them.

Conclusion

Student responses to the question, *What were the best aspects of your unit?* indicated support for this style of learning. Responses ranged from the enjoyment of arguing out the Bilby community issues with tutorial groups, the resources/website being able to get students interested and wanting to learn, the variations in articles/writing styles and helpful notes incorporated in the Bilby website. The mix of groupwork and using the Bilby website energised the learners, according to student feedback. However, there was also a sense that Bilby could get stale, that the virtual world needed to develop other stories as the student cohort grew and had requirements for another organisational situation or story. The scenario was designed in such a way that it grew with the demands of different student cohorts, and was flexible in its adaptation to writing for undergraduate programs as diverse as health, law, international studies and public relations.

Blended Learning Future Predictions

Blended learning has been appropriate to these learners, with an emphasis on providing engagement through immersion in a work-based project, in a Pacific island scenario or a virtual country town. The millennial learners engaged in these scenarios moved comfortably between the digital communications tools for the teams unit, the virtual world scenarios of the writing units and their own mix or blend of e-learning approaches. These time-poor millennial learners self-selected their favoured technologies and participation methods. They were strong participants in the team learning environment where the learning was centred on problem solving and a work-oriented output. The writing scenarios were seen as authentic learning, even though the virtual worlds were constructed – although

there was anecdotal evidence that some students believed *Bilby* and *Newlandia* did exist!

Curtis Bonk and Charles Graham (2006), have assembled a range of working models focusing on e-learning as a major part of the blended learning mix. The chapter by Bonk, Kyong-Jee Kim and Tingting Zeng summarises a comparison between workplace or organisational learning environments and higher education looking at the most widely used pedagogical techniques for e-learning. The most popular predictions for future e-learning in higher education focused on group problem-solving and collaborative tasks. Within the workplaces responses the focus was on authentic cases and scenario learning, with group problem-solving not in the first six predictions listed. Both the survey responses – higher education and workplace training - centred on active learning, problem solving, authentic learning and collaboration.

Hands-on learning activities were favoured as opposed to additional auditory, visual or reflective ones. Hands-on learning was deemed the weakest area in online higher education courses, but is predicted by the survey authors to become the most important in e-learning courses in higher education and the workplace.

The other area of interest is the perceptions of respondents to emerging technologies and their applicability to blended learning in the future. For the higher education survey (Curtis J. Bonk, Kyong-Jee Kim, Tingting Zeng, from Bonk and Graham, 2006), there were 14 technologies listed. Respondents predicted growth in usage of reusable content objects (an example would be the *Newlandia* site from the case study above being used by more than one unit, or *Bilby* storylines expanding). The predictions also focused on wireless technologies and peer-to-peer collaboration tools. Other options included digital libraries, simulations and games, assistive technologies and digital portfolios. In 2006 less than 5% listed e-books, intelligent agents, tablet PCs, virtual worlds, language support or wearable technologies.

For the workplace survey, the indicated technologies were knowledge management tools and online simulations, indicating more of an interest in working with a learning management system that is flexible. Wireless technologies, reusable content objects, adaptive technologies and tablet PCs/handheld devices were also strongly supported in responses. Less than 5% listed digital libraries, e-books, intelligent agents, Weblogs or Web diaries and multiplayer online gaming.

Coupled with the issues raised by Dede, there are key trends emerging in developing the blend. Blended learning seems to more commonly operate as a replacement for or extension of face-to-face environments. The approaches are not new – supporting learning communities, extending training events, follow-up resources, accessing guest experts, providing timely mentoring/coaching, online labs or simulations, providing supplemental resources (Bonk, Kim, Zeng, 2006). They require a flexibility and engagement with a range of interfaces which suit the millennial learner and their neomillennial learning styles.

The three interfaces, the mediated immersion Dede talks of, include the desktop interface, which offers access to distant experts and archives, and enables collaboration. Avatars also provide an environment of engagement, where a self-created digital character interacts with other digital characters and allows learners to transcend their physical selves and help design their own virtual environments.

Second Life and gameplaying sites are platforms enabling this. The third interface is the development of mobile wireless devices which will incorporate virtual resources into everyday life. This is the area of focus of many higher education institutions exploring the millennial learners' mobility and just-in-time approach to learning.

The trends to consider (Curtis J. Bonk, Kyong-Jee Kim, Tingting Zeng, in Bonk and Graham, 2006) focus most of all in capturing the interface environment Dede speaks of, in blended mobile learning. With this comes greater visualisation and individualisation, with hands-on learning determined by the learners. With the millennial style of learning also comes an increased connectedness of community and collaboration. There is also a growing trend towards increased authenticity and on-demand learning, with strong links between working and learning. These trends indicate that there will be changes in instructor/mentor roles, with abilities to take on multiple teaching and learning environments, such as coaching and mentoring, as well as instruction or skills delivery. Ultimately this will lead to the further emergence of blended learning specialists who are multifaceted, able to shift gears in adding new tasks and encouraging self-learning.

Future Trends

A research project conducted during 2007 compared an undergraduate and postgraduate group's expectations on future trends in learning approaches and technologies. The postgraduate group emphasised working in groups or teams – as they were the group working on the *Exposure* season (from Case Study 1 above) this was not entirely a surprise. Their preferred technology was the use of peer-to-peer collaboration tools, which also matched their needs with project work of this sort.

A comparison with the undergraduate group on future trends (amending slightly the Bonk and Graham descriptors referred to in their survey tools) indicated there was a consistency between groups in learning approaches. Undergraduates preferred teacher-directed tasks, simulations and students developing the learning, a mixture of structure imposed and student engagement through ownership. The postgraduate group preferred authentic work-based tasks, problem-based and negotiated with discussion. In the area of learning technologies, each group had an interest in simulations and games (undergraduate) and virtual worlds (postgraduate), with the undergraduates once again preferring a structure to the learning environment while postgraduate students were more interested in more open-ended access through e-learning tools and e-books.

The students' predictions of future trends, using the indicators from Bonk and Graham (2006) were remarkably similar. An interesting difference in the undergraduate/postgraduate learner survey was the undergraduate higher preference for increased connectedness, community and collaboration versus postgraduate linking of working and learning.

Group problem-solving and collaborative tasks leading to hands-on learning activities with a strong experiential focus will be the challenge for future e-learning resourcing. Transformative interfaces which are creative, lateral and

mobile will lead to multiple teaching and learning environments, an exciting challenge to meet the millennial learners' expectations.

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