Embodied learning on the network: Experiences from the field

Benjamin A. Kehrwald

School of Education, University of South Australia, ben.kehrwald@unisa.edu.au

Abstract

For many, if not most, professions, practice is embodied. Embodied learning associated with embodied professional practice poses a number of challenges for networked educators working in professional degree programs. The consideration of embodied learning forces a shift from a focus on cognitive, 'in the head' learning, to a more holistic view which includes whole body experiences, embodied practice and embodied cognition. This shift calls into question the ways learning is defined and the means by which learning is structured, facilitated, supported and assessed within educational programs. These questions can be difficult to address in networked learning situations where the physical has been supplemented or replaced with the virtual, where participant experiences are mediated by technology and in which good practices in learning design and facilitation are less well established.

The purpose of this paper is to provide a basis for understanding embodied learning and the ways in which it may be supported and facilitated in networked learning situations. This paper provides the conceptual foundations of a continuing project on the design and development of networked courses which support embodied learning. The paper is structured in three parts. The first part provides background through a description of embodied learning and its links to professional practice. The case in point is an initial (pre-service) teacher education program at the University of South Australia. The second part identifies commonalities between networked learning and embodied learning with reference Goodyear's (2002) framework for understanding 'good learning' as active, cumulative, individual, self-regulated and goal-oriented. The third part draws upon recent experiences designing and developing networked courses within a teacher education program at The University of South Australia. The discussion identifies challenges associated with practical work to design, develop and implement embodied learning including a) explicitly identifying intended learning outcomes associated with embodied learning; b) the relationship between 'real' (embodied, physical) and 'virtual' aspects of the learning experience; c) identifying appropriate learning environments for embodied learning; d) providing access to necessary physical artefacts to support embodied learning and e) creating records of performance as part of the learning (and assessment process). The discussion includes in-context responses to those challenges and a list of tentative conclusions which guide ongoing work related to these challenges.

Keywords

Embodied learning, learning design, educational design

Introduction

This paper derives from an increasingly common challenge experienced by networked learning practitioners in higher education, namely, the design, development and implementation of networked courses which support the development of embodied learning. The consideration of embodied learning forces a reimagining of learning outcomes from a focus on cognitive, 'in the head' learning, to a more holistic view which includes whole body experiences, embodied practice (Lave & Wenger, 1997) and embodied cognition (Wilson & Golonka, 2013). This shift calls into question the means by which learning is structured, facilitated, supported and assessed within educational programs. These questions can be particularly difficult to address in networked learning situations where the physical has been supplemented or replaced with the virtual, where participant experiences are mediated by technology (Steeples, Jones, & Goodyear, 2002) and in which good, better and best practices in learning design and facilitation are less well established.

The purpose of this paper is to provide a basis for understanding embodied learning and the ways in which it may be supported and facilitated in networked learning situations. The presentation below is not comprehensive. Rather, it seeks to provide educational designers and networked educators a starting point for a) understanding embodied learning as it relates to professional practice as an outcome of professional degree programs; b) identify the common ground between embodied learning and networked learning, including how embodied learning might be facilitated on the network and c) begin to identify implications for networked learning design, development and teaching practices as part of the ongoing development of understanding of supporting embodied learning in networked learning situations.

The following discussion addresses these issues in three parts. The first provides background through a description of embodied learning and its links to professional practice. The second identifies commonalities between networked learning and embodied learning with reference to foundational ideas from networked learning (Steeples & Jones, 2002) and emerging understandings of embodied learning. The third identifies implications and challenges associated with practical work to design, develop and implement embodied learning within a teacher education program at one Australian university.

Embodiment and professional practice

For many, if not most, professions, practice is embodied (Webster-Wright, 2009). The case in point for the author is teacher education. Teachers' work in most schooling settings is embodied (Beals et al., 2013): physical presence in classrooms, in-person presentations, and interactions with students are but a few common examples. Beyond these examples, teachers' work in certain curriculum areas is much more obviously embodied and performative (Australian Curriculum & Authority, 2012). The teaching of physical education, dance, drama, design and technology ('home economics', 'vocational education') and music are all examples of embodied work involving human movement and manipulation of physical artefacts in the local environment. So, from the outset of a learning design project in teacher education, there are tensions between the technology-mediated experiences of networked learners and the physical, in-person performances required of graduates. These ideas can be extended to many other professions. Beyond teaching, examples include health care professionals' dynamic physical interactions with patients as part of diagnosis, treatment and rehabilitation; solicitors' abilities to actively interpret and respond persuasively as part of legal proceedings and scientists' work both in laboratories and in the field to collect evidence, observe and experiment.

Although definitions of embodied learning are evolving and sometimes contested, the crux of embodied learning is in the 'doing' rather than simply 'knowing'. Embodied learning involves the creation, manipulation and sharing of meaning through engaged interaction with artefacts and others. This manipulation engages the learner not only mentally (as with traditional views of cognition), but physically through movement, manipulation and direct experience and affectively through involvement of feelings, attitudes, beliefs and values as part of critical judgement and decision making within authentic activity (Lawrence, 2012; Lyons, Slattery, Jimenez, Lopez, & Moher, 2012; Wilson & Golonka, 2013).

Embodied learning activity is not new to education. It has long been a part of performance-based professional learning as 'hands on' learning, practicals, laboratory work, studio sessions and fieldwork which aim to reinforce and extend in-the-head, cognitive 'classroom learning' and produce graduates capable of engaging in more holistic professional practice. Professional practice in this case implies a subject who engages in performative, often embodied activity which demonstrates a combination of increasingly expert knowledge and skills which are employed strategically with attitudes, values and beliefs (amongst other things) as participation in the activity of a profession.

A central issue for educational designers working on programs with embodied learning outcomes is this: Beginning with the idea that professional practice is embodied, it follows that the learning which underpins learners' progress from 'novice' to increasingly skilful practice is, to some extent, also embodied. Therefore, there is a need to incorporate embodied learning activity as part of the development of professional skills which underpin competency in the respective professions. Moreover, there is a need to understand learning processes which incorporate cognitive, physical and affective dimension of learning in order to progress learning designs beyond the limits of cognitive learning toward more holistic learning.

Proceedings of the 9th International Conference
on Networked Learning 2014, Edited by: 179
Bayne S, Jones C, de Laat M, Ryberg T &
Sinclair C.

ISBN 978-1-86220-304-4

Common ground for embodied learning and networked learning

In the foreword to the volume on Networked Learning: Perspective and Issues, Spector (2002, p.xv) provides a succinct description of learning: " Learning is essentially about change. Learning involves changes in attitudes, beliefs, capabilities, knowledge structures and skills. When these changes have been observed and can be believed to persist for some time, it is reasonable to conclude that learning has occurred" (p. xv). He goes on to argue that "…the definition of learning is not changing. Rather, what is changing is how we facilitate and support effectively learning, especially with regard to complex subject matter" (p. xv). Spector's definition of learning and assertions about support and facilitation provide a basis for considering the common ground between embodied learning and networked learning. Using Goodyear's (2002) descriptions of the psychological basis of networked learning and his summary of the characteristics of 'good learning' it is possible to identify points of commonality between the embodied learning and networked learning and begin to see the possibilities for using networked computing and communications technologies to support embodied learning activity.

Goodyear (2002) describes 'good learning' as active, cumulative, individual, self-regulated and goal-oriented. This framework provides a starting point for considering the common ground between networked learning and embodied learning and foreshadows some of the challenges in learning design for networked learning in which embodied learning is one of the intended outcomes.

A focus on learning as an active process draws attention to what learners do as part of learning. While this may imply an emphasis on cognitive processes for educational programs which aim to produce on cognitive learning outcomes, it also calls attention to physical activity, human movement and the links between cognitive activity, physical activity, affect and the environment in which activity is situated. Put simply, a view of learning activity which is inclusive of physical activity provides the basis for linking embodied learning to networked learning. Thus, for educational designers and teaching academics, an emphasis on embodied practice refocuses conversations about learning activity from understanding concepts, using symbols, and constructing representations to also include psychomotor activity, patterns of movement, physical manipulation, and behaviour. It accommodates historical views of 'in the head' learning whilst extending the definitions of learning to include embodied performance in which levels of expertise are defined by a complex interplay of cognition, physical activity and affect.

However, this broader view of learning activity also raises important questions about the relationship between networked activity which is mediated by technology (i.e., online activity) and physical activity and direct experience which are not likely to be mediated by networked technology (i.e., offline activity). How can these two different types of activity be used in ways which are a) supportive of one another and b) supportive of the intended embodied learning outcomes? These challenges foreshadow an approach which blends online and offline activity as part of an approach to hybrid (or blended) networked learning. This is approach is discussed in the following section.

The view that learning is cumulative has two important implications for designers. The first is that what learners can do upon entering any learning situation will affect their engagement with the intended learning activity. For embodied learning, this means understanding and working with not only what they know, but what they can physically do. When considering embodied learning alongside networked learning, this requires additional up-front analysis of learners' physical capabilities in order to design for both cognitive and physical development, which are, in many cases, interdependent in performance-based practice. Given the performative nature of professional practice, it also implies a need to understand learners' affect including dispositions toward activity, values which inform judgement and attitudes which may influence behaviour.

The second important implication of learning as a cumulative process is that designers should be mindful of a developmental approach to learning and learners progress from novice to expert practice. This point highlights the opportunity to explicate the continuum of development in order to clearly identify stages of development and better understand the particular needs of learners at any stage with respect to their cognitive, physical and affective learning. Understanding the developmental continuum within the context of a particular subject or practice field allows designers to conceive and structure learning processes which help learners progress incrementally toward the end goal of competent professional practice. Notably, this process of explication of the developmental continuum provides an important opportunity for educational designers to identify the

Proceedings of the 9th International Conference on Networked Learning 2014, Edited by: Bayne S, Jones C, de Laat M, Ryberg T & Sinclair C.

ISBN 978-1-86220-304-4

180

relationships between the cognitive, physical and affective dimensions of the intended learning and account for them within the overall learning design.

The view that learning is an individual pursuit emphasises the idiosyncratic nature of sense-making and skills development. It draws attention to the needs of individual learners and the difficulties of treating all learners as though they were the same. Appreciation of the range of potential differences between learners foreshadows a practical challenge in accommodating difference where difference extends to the physical environments learners work in and the resources they have at their disposal to support their learning. One particular example of this is the consideration of the learnplace. Goodyear (2002) highlights the role of the learnplace, the physical environments in which learners' activity is situated. He emphasises that while individual learners configure their personal learnplaces, there is a role for educational designers to construct or modify the spaces in which learning takes place. These points are particularly relevant in the context of embodied learning as the physical environment contains resources which are influential in shaping learners activities and the resulting outcomes. The shaping of learnplaces provides an opportunity for educational designers to structure and support learners' embodied activity. However, this is not straightforward. As learners in networked learning situations are not likely to be co-located, there is likely to be great variation in their personal learnplaces. So, there is a need to both a) provide reasonable assurance of access to necessary resources within the learners' learnplace, e.g., through the provision of a set of standard resources and b) support learners efforts to identify and use additional resources within their learnplace.

While the individuality of learners is important, it does not imply that individuals learn best in isolation or that they are not influenced by others. The reality may be quite the opposite. Just as networked learning is predicated on connections between learners and others (other learners, teachers and within learning communities (Spector, 2002)), embodied learning is premised on interaction between learners and their environments, including all of the resources that are available within those environments. In the context of authentic professional practice, the available resources include other people and practice is often either explicitly or tacitly collaborative, as part of work in professional teams or completed in collaboration with clients or other stakeholders.

Finally, the ideas of self-regulation and goal-orientation in learning are linked. Learners regulate their learning through both awareness of their activity and the ways in which they exercise agency to make decisions about what activities to engage in, and how and when to act. Learning goals provide the 'why' of 'Why would I engage in this learning activity?' as they explicitly identify intended outcomes of individual activities, sequences of activity and whole units of work. The explication of learning goals which relate to professional practice in general and are elaborated to include particular skills related to authentic professional activity can provide powerful motives for students as they engage and demonstrate commitment to particular types of learning activity.

In summary, it seems that a Goodyear's (2002) framework for 'good learning' helps identify the common ground between embodied learning and networked learning. Also, notwithstanding the challenges foreshadowed in the discussion, it would seem that understanding of the qualities of good learning coupled with an understanding of learning design and development processes provides a basis for a systematic approach to design and development which can accommodate the combination of cognitive, physical and affective learning which constitutes embodied professional practice. In the following section, the presentation shifts from the conceptual to the practical in considering the case of design and development of courses within a pre-service teacher education program in one Australian university.

Experiences from the field: Practical challenges in embodied learning on the network

Context

The Bachelor or Education (Teaching) is the flagship undergraduate program in the School of Education at the University of South Australia. It enrols approximately 500 students per year in a four year program offered from 2013 on site at 2 urban campuses, 2 regional campuses and online. Students enrolled 'on campus' are offered a blended learning program with expectations of both on-campus and online activity. Other students enrol 'online' with no expectation of on-campus activity and use the online learning environment as their

Proceedings of the 9th International Conference on Networked Learning 2014, Edited by: Bayne S, Jones C, de Laat M, Ryberg T & Sinclair C.

ISBN 978-1-86220-304-4

181

primary learning environment in each course.   All students, regardless of their enrolment on-campus or online, have access to a common set of learning resources and a common online learning environment for each course. Also, as part of program requirements, all students complete a number of days on-site in schools each year. Graduates of the program are provisionally registered as early childhood, primary school, or primary/middle school teachers upon demonstration of meeting the national teaching standards for graduates.

The case in question is the design and development project for this program. It involves the redevelopment of all courses in the four year program structure for flexible, technology-enhanced delivery. The approach to this project draws heavily from current understandings of good practice in technology-enhanced learning, including networked learning, with a systematic approach to quality assured course design and development as part of the shift to technology-enhanced versions of each course, attention to good practice in technology-enhanced learning and teaching, and mechanisms to promote continuous quality enhancement through iterative cycles of evaluation, development and implementation. At the end of 2013, the first year of the flexibly-delivered, technology-enhanced program was in place and development of the second year was complete, awaiting implementation in 2014.

Challenges

Consistent with the discussions of embodied learning in the preceding sections, the program redevelopment project was confronted with a number of practical challenges related to embodied learning in the technology-mediated (networked) parts of each course. The following discussion identifies several challenges that have been encountered in the development of the first half of the program and the implementation of the first year, with reference to potential solutions.

Amongst the most challenging aspects of the learning design process were the explication of the intended learning outcomes and the definition of learning processes which lead to those outcomes. As foreshadowed in the preceding discussion, it was important for the educational designers and teaching academics to a) identify expert practice within each subject area or sequence of courses in the program; b) elaborate the intended learning as part of a developmental continuum across the four year program; c) explicate the cognitive, physical and affective dimension of the intended learning so these could be accounted for the in learning design process. For experienced educators accustomed to teaching almost exclusively face-to-face and acculturated into higher education administrative process which emphasise cognitive aspects of learning, the unpacking of tacit knowledge related to embodied expert professional practice was a labour intensive and time consuming process. This process was aided by the generation of a number of artefacts, including a process-based concept map for each course which provided an explicit record of the intended learning. The course map was developed as part of a backward design process and, when completed, provided a 'blueprint' for the course writing and development process.   At any point in the planning and design of the course, the course map represented the latest shared understanding of the course content, learning process, resources, intended outcomes and assessment. For any sequence of courses within a learning area, the longer-term learning process (across four years of the program) was explicated in the series of course maps. At the program level, the intended learning outcomes were defined by the national graduate teacher standards. The course maps for each sequence of courses (e.g., professional practice, literacy, numeracy and mathematics, specific curriculum areas) identified the outcomes of each course and units of work within the course, providing an extensive elaboration of the key milestones in the overall process.

A second broad challenge was conceptualising the relationship between the virtual and the physical (or 'real') experiences of learners within each course. The program's commitment to a flexible, technology enhanced offering implied a degree of technology-mediation in each course. However, the embodied nature of the some of the intended learning implied the inclusion of 'place based' learning wherever the learners' bodies were located. This highlights one of the key issues for embodied learning: It takes place wherever learners are physically located, i.e., wherever their bodies are. However, there is no requirement that the teaching staff in the educational arrangement be co-located with the learners. The learning experiences which constitute an embodied learning process must include the physical, but can be supported and facilitated by the connections provided via networks mediated by technology, i.e., the 'virtual'. The natural result was a form of blended learning for all students – learning activity include a mix of physical and cognitive activity and learning took place in a variety of physical places and virtual spaces. All students shared online learning environment for each course. However, all students also had access to a range of physical environments, including campus facilities (for some students), the physical environments of the schools which they visited as part of practical

placements, their homes and community environments. Using the course maps as a guide, the learning process for each course was carefully conceptualised not only in terms of intended learning activity, but in terms of the virtual and physical environments which were the venues for learning. So, in addition to the other information supplied as part of structuring and supporting each learning task, the venue for learning activity had to be specified: online, on campus, in schools, at home or in other local environments.

A third challenge which followed the conceptualisation of the blend of the virtual and the physical was the structuring and support for physical activity through both a) the definition of appropriate physical environments for learning tasks and b) the provision of physical resources for use in those environments. Notably, as part of the design process, decisions were undertaken about the extent to which each learning experience would be 'virtual' (technology mediated) or 'real' (physical, real world). There was a careful examination of the potential of both virtual and physical environments to produce rich, multisensory and/or immersive experiences for learners. Due to the limitations of digital media, the costs of multimedia development and the nature of technology-mediated experience, there was a decision to use physical manipulables and real world environments as much as possible. As a result, it was necessary to help students identify real world environments and situations in which to practice at their embodied activity. While these contexts and situations are relatively easy to construct in the controlled environments of on-campus teaching spaces, the situation for off campus students was much different. Rather than deal with the enormous potential variation between individual learnplaces, the designers focused on common features of local communities: the local school, in which students may already be working on practical placement; sports grounds which gave community members access to open spaces for human movement tasks; and household situations which provided context for certain types of embodied activity. In addition to the physical environments, there was the question of physical resources which were required for embodied work. Historically, students within the program studying on-campus had been provided access to tools, materials and other resources as part of their embodied work. The addition of two teaching sites and a number of online students challenged this precedent. There were three main approaches to addressing the provision of physical resources. Whenever it was cost-effective, a clearly defined set of materials for the respective courses was supplied to students. In the case of tools and teaching resources, learners were required to purchase the resources as part of their preparation for participation in the profession consistent with the notion that these were 'tools of the trade'. In cases where neither of these solutions was practical, it was possible to give students physical access to specialist technology, equipment or other resources during their visits to schools. To date, these three approaches have address learners' needs for physical resources within the program.

Another notable challenge which arose was the need to create and work with records of performance. For learners who were not co-located with the teaching staff, there was a need to record embodied work to create opportunities for feedback and, eventually, assessment. The approach to addressing this challenge was the creation of rich media artefacts including photographic evidence, video records and multimedia presentations by learners. Learners were required to have access to technology which would support this type of record creation including digital cameras with video capability. While this approach added complexity for learners in developing technical skills associated with making and using the records, it was seen as an essential mechanism to provide formative feedback and assess the embodied work of remote students. The approach is still being implemented, but it has provided two unexpected benefits. First, the creation of rich media artefacts instead of physical artefacts shifted attention from the physical product to the learning process. The records of in-process work created opportunities for learners to work at a meta level, focusing not only on what activities were undertaken and the results produced, but also a reflective analysis of how and why particular results were achieved. Second, the creation of records created learning opportunities related to the use of the performance records for self- and peer-assessment, reflection and explicit tracking of development with and across courses. The persistent records created in photographic and video artefacts provide opportunities for students to revisit their practices repeatedly through the program over four years to assess their progress.

Conclusions

As the development work in this project is ongoing, there are relatively few firm conclusions to draw, but there have been a number of 'lessons learned' which inform the ongoing work and may be applicable to similar professional degree programs seeking to support embodied learning on the network.

Proceedings of the 9th International Conference on Networked Learning 2014, Edited by: Bayne S, Jones C, de Laat M, Ryberg T & Sinclair C.

ISBN 978-1-86220-304-4

183

The first lesson is that embodied learning (as described in this paper) is not well understood in the context in question. There was little or no evidence of a shared understanding of embodiment, embodied cognition, embodied learning or the relationship between 'in the head' and more holistic views of cognition. The lack of shared understanding is largely unsurprising. Education in general, and teacher education in particular, lie at the intersection of several discipline areas, each of which may have specific views of how 'learning' takes place, which cognitive mechanisms are important and how the intended learning is best supported and facilitated. These issues are not straightforward. The teaching of teachers is influenced by ideas about how people learn which are drawn from psychology, sociology, anthropology, cognitive and learning sciences, among others. Teacher education is also influenced by a solid grounding in subject knowledge in each of the subject areas which are taught in schools (maths, language and literacy, sciences, arts, physical education, etc.). Notably, each of these subject areas has particular epistemic, ontological and axiological viewpoints which affect the way subject experts view the teaching and learning of their subject. Therefore, establishing consensus positions on good practice in teaching and learning can be a very complex process owing to the variety of influences on those ideas of good practice.

Conversations with the participants in this project highlight that while many teacher educators in this context could agree on broad points such as the fact that teachers' work is embodied, and identify potential conflicts between the embodied nature of teachers' work and the (potentially) disembodied nature of learning activity and experience networked learning situations, they were not able to articulate clear rationales in favour or against embodied learning practices. Rather, they referenced what they knew, what was familiar and what they had personally experienced. In the context of this development project, this implied a considerable amount of work to establish shared understandings embodied learning and its role in teacher education relative to each of the disciplines which are part of teacher education.

The second lesson is an extension of the first. The acknowledgement of a lack of clear understanding about embodiment, the embodied nature of professional practice and the role of embodied learning the overall learning process provided insight into the resistance to a shift toward flexible, technology-mediated teaching and learning. The reservations of teaching academics about a move from place-based 'in the classroom' teaching to flexible blended and online delivery was partly attributed to a lack of experience or understanding about the potentials of technology-mediated learning to support the intended learning. This was due in part to fact that the 'intended learning', a significant part of which was embodied, was not well understood except in the terms of academics previous experiences, which were largely place-based. In particular, the intended learning was not well understood as a combination of 'in the head' learning and embodied practice. Therefore, the design and development process was as much a process of discovery for academics inexperienced with technology-mediated learning as it was about the planning, creation and implementation of a professional degree program. Following the implications of the previous lesson learned, which underscore the importance of a clear understanding of the 'intended learning', the implication for this project and others like it is that in the context overcoming resistance to the shift from place-based to flexible technology mediated learning, is a clear understanding of the potential of the technology to mediate or support learning activity which leads to those outcomes is important.

The third lesson is that the design, structuring and support for embodied learning situations owes much to established notions of good practice in distance education in general and technology-enhanced distance education in particular, including networked learning. Given the previous about understanding the potential of technology to mediate or support learning, a high level of understanding and expertise with technology mediated (networked) learning illuminates the possibilities for supporting embodied learning on the network. Owing to the fact that embodied learning takes place wherever learners are physically located and that the teacher will not necessarily be co-located with the learner, aspect of the design and development brief clearly fit with established notions of distance education. The implications of this lesson are that the design and development of programs which support embodied learning on the network should borrow ideas about good practice from distance education and look for solutions to persistent problems in support and facilitation from continually evolving practice in distance education. In some sense, distance education practices should influence more 'mainstream' design, development, support and facilitation. Systematic approaches to design and development (e.e., Gagne, Briggs, & Wager, 1992; Ganesan, Edmonds, & Spector, 2002; Jona, 2000; Sims, 2006), attention to learner support mechanisms (Collins, 1998; Thorpe, 2002) and online facilitation (and other forms of online teaching)(Garrison, 1997; Mason, 2001; Mayes, 2001; Salmon, 2000) are all practices which have their roots in distance education, but are directly applicable to projects such as the one described in this paper, seeking to support embodied learning on the network. Although teaching academics in various professional degree

Proceedings of the 9th International Conference on Networked Learning 2014, Edited by: Bayne S, Jones C, de Laat M, Ryberg T & Sinclair C.

ISBN 978-1-86220-304-4

184

programs may not be experienced distance educators, they should make the most of the discourses of distance education to support and facilitate embodied learning on the network.

References

Australian Curriculum, A., & Authority, R. (2012). *Australian Curriculum: The Arts Foundation to Year 10: Draft for Consultation*: ACARA.

Beals, F. M., Braddock, C., Dye, A., McDonald, J., Milligan, A., & Strafford, E. (2013). The Embodied Experiences of Emerging Teachers Exploring the Potential of Collective Biographical Memory Work. *Cultural Studies↔ Critical Methodologies, 13*(5), 419-426.

Collins, M. (1998). I know my instructional technologies; its these learners that perplex me. *DEOSNEWS, 8*(9).

Gagne, R. M., Briggs, L. J., & Wager, W. W. (1992). *Principles of instructional design* (fourth ed.). Belmont California USA: Wadsworth.

Ganesan, R., Edmonds, G. S., & Spector, J. M. (2002). The changing nature of instructional design for networked learning. In C. Steeples & C. Jones (Eds.), *Networked learning: Perspectives and issues* (pp. 93-110). London: Springer.

Garrison, D. R. (1997). Computer conferencing: The post industrial age of distance education. *Open Learning, 12*(2), 3-11.

Jona, K. (2000). *Rethinking the design of online courses*. Paper presented at the ASCILITE, Coffs Harbour NSW. **http://www.ascilite.org.au/conferences/coffs00/**

Lave, J., & Wenger, E. (1997). *Situated learning: Legitimate peripheral participation*. Cambridge, UK ; New York: Cambridge University Press.

Lawrence, R. L. (2012). *Bodies of Knowledge: Embodied Learning in Adult Education: New Directions for Adult and Continuing Education, Number 134* (Vol. 125): John Wiley & Sons.

Lyons, L., Slattery, B., Jimenez, P., Lopez, B., & Moher, T. (2012). *Don't forget about the sweat: effortful embodied interaction in support of learning.* Paper presented at the Proceedings of the Sixth International Conference on Tangible, Embedded and Embodied Interaction.

Mason, R. (2001). Effective facilitation of online learning: the Open University. In J. Stephenson (Ed.), *Teaching & learning online: pedagogies for new technologies* (pp. 67-75). London: Kogan Page.

Mayes, J. T. (2001). Learning technology and learning relationships. In J. Stephenson (Ed.), *Teaching & learning online: Pedagogies for new technologies* (pp. 16-26). London: Kogan Page.

Salmon, G. (2000). *E-moderating: The key to teaching and learning online*. London: Kogan-Page.

Sims, R. (2006). Beyond instructional design: Making learning design a reality *Journal of Learning Design, 1*(2), 1-7.

Spector, J. M. (2002). Foreword. In C. Steeples & C. Jones (Eds.), *Networked learning: Perspectives and issues* (pp. xii-xvii). London: Springer.

Steeples, C., & Jones, C. (Eds.). (2002). *Networked learning: Perspectives and issues*. London: Springer.

Steeples, C., Jones, C., & Goodyear, P. (2002). Beyond e-learning: A future for networked learning. In C. Steeples & C. Jones (Eds.), *Networked learning: Perspectives and issues* (pp. 323-342). London: Springer.

Thorpe, M. (2002). Rethinking learner support: The challenge of collaborative online learning. *Open Learning, 17*(2), 105-119.

Webster-Wright, A. (2009). Reframing Professional Development Through Understanding Authentic Professional Learning. *Review of Educational Research*.

Wilson, A. D., & Golonka, S. (2013). Embodied cognition is not what you think it is. *Frontiers in psychology, 4*.

Proceedings of the 9th International Conference on Networked Learning 2014, Edited by: Bayne S, Jones C, de Laat M, Ryberg T & Sinclair C.

ISBN 978-1-86220-304-4

185