Paper 168 – Full Paper

The global classroom for supply chain management, any time, anywhere!

Authors
I Reid
A Southern

Address for correspondence
University of Liverpool Management School, Chatham Street, Liverpool, L69 7ZH
email:reidi@liv.ac.uk
University of Liverpool, 126 Mount Pleasant, Liverpool, L69 3GR
email:asouth@liverpool.ac.uk

Abstract
Academia is facing increasing demands in the design and delivery of their degree programmes due to resource constraints and the demands to embrace. The purpose of this article is to examine the requirement for quality education in the field of supply chain management. The approach adopted here is a reflective one, looking at recent trends in postgraduate Supply Chain Management (SCM) education and focusing in particular on a new mode of delivery, that of e-learning. The paper considers the development of SCM education and presents the range of supply chain management programmes and modules being offered across a selection of UK universities. The article also highlights the dynamic character of SCM education and considers whether the e-learning format is capable of responding to the requirements for quality in this field. Through a focus on one particular programme, the wholly online postgraduate programme in Operations and Supply Chain Management at the University of Liverpool. The conclusions are that new forms of teaching and learning are opening up to Higher Education Institutions (HEIs). The aim of the research was to discover the real time dynamic of SCM practice and theory, objective and subjective perspectives.

Keywords: Supply Chain Management, HEIs, UK, E-learning, Online Education

1. Introduction

Practitioners often talk about the need to systemize training functions or maximise their investment in education, while many organisations seek to develop the employability of the workforce and remain competitive in the marketplace (Dillich, 2000). This has been an added impetus in the field of Supply Chain Management (SCM) where there has simultaneously been a rapid growth of training and educational opportunities. SCM can range from a few sessions in a required course, a particular module or a specialised degree. The mode of delivery might be face to face, full time on campus, or part time, or at a distance such as through the provision afforded by the Open University (OU). Many Higher Education Institutions (HEIs) are seeking to create diversity in the classroom for example, by recruiting more students from overseas and indeed by establishing a base, in some form, in other countries, often in developing countries (see for example Hitt, 1997). This is part of the increasingly competitive higher education environment as HEIs seek ways of reaching new students and widening participation.

2. Supply Chain Management Education

Supply chain management (SCM) is embedded in the turbulence of contemporary management (see Gonzalez, Gioconda, Gourdin, Hartley, 2008). This has increased the pressure to provide quality training and education as the scholarly landscape addressing SCM theories and practices has dramatically changed and the increased emphasis of relationships and marketing channels have all become accepted elements of SCM (Lancioni, Forman, and Smith, (2001), essential as Christopher (1998) notes, in the drive to ensure superior customer value at less cost. There is also unambiguous professionalisation of SCM that has taken place, as clearly seen by the work of bodies such as the Chartered Institute of Purchasing and Supply (CIPS), the Chartered Institute of Transport and Logistics (CITL) and the Institute of Operations Management (IOM). Yet where this article seeks to make a specific contribution is through questioning whether the mode of delivery can be a contributory factor in satisfying the requirement for quality SCM education. In this sense, there is a need not only for a critical understanding of SCM, but also to reflect on how we create knowledge that informs the practice of SCM. To this end, we posit the experience from the delivery of a wholly online postgraduate MSc in Operations and Supply Chain Management and the lessons that the authors are able to draw on, thereon in.

In response to the critique of HEI provision, professional bodies have sought to effectively 'badge' a number of programmes. This has been one response to the challenges of enhancing quality within SCM programmes and has also been part of a wider encouragement of HEIs collaborating with industry practitioners. HEIs are keen to provide to graduates recognition of a type that goes beyond the awarded degree and if this can be an internationally recognised association then all the better. The Chartered Institute of Purchasing and Supply (CIPS) is one such accrediting body that has raised the profile of such SCM degree programmes, but so too have the Chartered Institute of Transport and Logistics (CITL) and the Institute of Operations Management (IOM). Table 1 provides a simple and selective comparison of postgraduate programmes in the field.

We see here the mode of study that the programme is available as, the core and elective teaching associated with the programme, the cost of the programme and whether or not accreditation has been obtained. The consistency of the modules on offer is a feature, with a limited delineation between programmes from different UK HEIs. This would indicate the key aspects of the discipline, acknowledged by the accreditation agencies, and some attempt at differentiation based around research strengths in the respective HEI. In terms of price for an international student, the lowest fee of £10,335 and highest of £17,500 does indicate some degree of difference. Notably the latter is both CIPS and CITL accredited and while this may be important, it is unlikely that accreditation alone would account for the difference. Again, research reputation and international standing in the particular discipline will be crucial in determining price.

Table 1 therefore provides a clear indication as to the competencies one would expect a student to obtain from a postgraduate SCM programme. By drawing on these fields to inform its integrative philosophy, SCM necessarily incorporates the various concepts, theories and methods found in each of these other disciplines, including qualitative, contextual, analytical, and quantitative approaches. Academics have followed a shift in SCM research emphasis to developing management models that guide SCM implementation. This is also influenced by the dynamics of the commercial world in which managers of supply chains and logistics operate and as a result has placed a pressure on HEIs to understand the needs of organisations and has added credence to the professionalisation of personnel.

Table 1 Selected comparison of postgraduate SCM programmes

MSc Programme:	Mode	Core Modules	Electives	Fees 2009/10	A-body
The University of Warwick MSc Supply Chain & Logistics Management	Full Time	•Financial Analysis & Control Systems •Logistics & Operations Management •Organisations, People & Performance •Procurement & Inventory Management •Supply Chain Management •Problem Solving With Statistics •Storage & Warehouse Techniques •Transportation Techniques & Management	•Choice of 2 from 61 Electives •Project 50% final Grade	£15,000 (Overseas) £5,570 (Home and EU)	CIPS
Lancaster University MSc Logistics and Supply Chain Management	Full Time	•Problem Solving & Consulting Skills •Spreadsheet Modelling Skills •Introductory Statistics •Introduction to Operational Research Techniques •Introduction to Logistics and Supply Chain Management •Introduction to Marketing Analytics •Software Support for Logistics & SCM (10 credits) •Manufacturing Management (10 credits) •Logistics (10 credits) •Strategic Supply Chain Management (10 credits)	In addition, you choose 30 credits: •Problem Structuring (10 credits) •Computer Simulation (10 credits) •Forecasting (10 credits) •Stochastic Modelling (10 credits) •Optimisation & Heuristics (10 credits) •Public Sector Analysis (10 credits) •Revenue Management (5 credits) •E-business (5 credits) •Project (60 Credits)	£12,500 (Overseas) £8,000 (Home and EU)	
Heriot-Watt University MSc Logistics and Supply Chain Management	Full Time	•Logistics and Supply Chain Strategy •Global Purchasing and Supply •Freight Transport •Inventory and Operations Management •Design and Operation of Logistics Systems •Distribution Centre Design and Management •Green Logistics •Supply Chain Improvement and Control	•MSc Dissertation	£10,545 (Overseas) £5,799 (Home and EU)	CITL, CIPS
Cranfield University MSc in Logistics and Supply Chain Management	Full Time	•Manufacturing and Spares Management •Quantitative Modelling •Organisation Development and Project Management •Supply Chain Process Re-design •Freight Transport •Business Statistics •Warehouse Design and Operations •Demand and Inventory Planning •Procurement Management •Logistics and the Supply Chain Concept	•Simulation •Distribution Centre Design •Performance Measurement in the Supply Chain •Logistics Outsourcing •Marketing •Demand Chain Management •Sustainable Supply Chain Management •Road Freight Transport •Planning and Resourcing for Road Freight Transport •Six Sigma in the Supply Chain	£17,500 (Overseas) £9,500 (Home and EU)	CITL, CIPS
University of Liverpool MSc Operations & Supply Chain Management	Full Time Part Time Wholly Online	•Strategic Operations Management •Supply Chain Operations Management •Logistics and International Trade •Business Analysis and Assessment •Total Quality Management •Lean Thinking *Students choose one from Group A and one from either Group A or Group B.	•Operations Modelling and Simulation •Project Management •E-Commerce •Marketing Management •International Business and Emerging Markets •Performance Management •Specialisation modules: Oil & Gas •• Economics of Oil, Gas and Energy •• Managing Energy Sources •Specialisation modules: Procurement & Sourcing •Contracts and Procurement •Financial and Legal Aspects of International Trade	£12,600 (Overseas on-campus) £6,500 (Home and EU on-campus) Home /EU£10,800 £10,800 (Wholly online)	CIPS, IOM CIPS

3 Modes of Study: The E-Learning Environment

Increasingly, the e-learning environment is being used in management education as an addition to the more traditional face-to-face, traditional physical lecture room (Landry,

Griffeth, & Hartmann, 2006). These online and virtual environments are particularly useful when dealing with part-time or distance learning students or to organize group work activities or assignments and some authors have argued pertinently in the case of management, that e-learning has contributed in discovery-based learning theories, (see Bicknell-Holmes & Hoffman, 2000). It is noticeable therefore that a 2004 survey of Commonwealth HEIs recorded that 54% expected off-campus online learning to play a major role in their institutional strategy over the next 5 years, an increase from 36% two years earlier (OBHE, 2004). This view has become embedded within HEIs as the current Online Learning Task Force has noted (White, Warren, Faughnan and Manton, 2010).

The reason for this is that e-learning opens up opportunities for many people who for reasons that might be economic, tied to family, or simply distance would find it impossible to become full-time residential students (Moisey. 2004). Universities see, in meeting the needs of a wider group of students, an opportunity to expand and deliver their programmes to underserved populations as well as being able to deliver on an international scale. Thus e-learning is able to make knowledge available to users or learners and can in an asynchronous manner, disregard time restrictions or geographic proximity (see Greasley, Bennett, & Greasley, 2004). Others have noted how to counter increasing competition HEIs have recognised the value of e-learning as an instructional tool and are developing, or have developed online learning programmes (Allen & Seaman, 2008; Larreamendy-Joerns, & Leinhardt, 2006). Some suggest e-learning has advantages over traditional face-to-face education (see Piccoli et al., 2001), although there are concerns that include time spent online, labour intensive study methods, and costs incurred in running e-learning environments. We might add that the costly high failure rate of e-Learning implementations discussed by Arbaugh, Duray (2002) deserves attention from educationalists and learning technologists.

At the University of Liverpool in the UK a number of postgraduate programmes have been established that are wholly online in character. One of these, the MSc in Operations and Supply Chain Management (MSc OSCM) is used now to demonstrate the e-learning environment in more detail.

3.1 Background: MSc Operations and Supply Chain Management (Online)

The MSc OSCM emerged from the established on campus equivalent. More specifically, in its design the programme became targeted towards working professionals in the domain of SCM, seeking potential students many of whom would already have significant practical experience and sophisticated understanding of the field. The programme is delivered in partnership between the University of Liverpool and Laureate Online Education, a for-profit organisation with its headquarters in Baltimore, USA. The strategic nature of the partnership is important for both organisations although most relevant here, the quality assurance and full control over all academic and teaching aspects of the programme rests with the University. The MSc OSCM programme received CIPS accreditation in 2010.

The University therefore oversees all academic aspects of the course programme, to ensure that the procedures required by the UK Quality Assurance Agency are followed ensuring, in the e-learning environment, that appropriate academic standards are maintained. The distinctive feature of this 100% online programme is, of course, the module delivery mechanism. Each taught module, in general, is delivered entirely online over the Internet, over a period of eight weeks. Module delivery involves the use of proprietary software to support the virtual classroom with a small cohort of students, usually around 16 students, guided by an academic instructor. There are no set times for lectures as the virtual classroom operates in asynchronous mode. Modules run for an eight-week period, each week equating with an e-learning seminar. If, as is expected to be the norm, a student pursues only one

module at a time, this schedule would enable the full programme, including the final dissertation project, to be completed in about 2.5 years, although this can be extended to allow for longer periods and ensure progression. Typically a seminar would incorporate a set of discussion exercises to be "posted" during the week with an expectation of student participation in further discussion, perhaps a rejoinder of other students' views, to formulate the basis of a critique of the discipline that is collectively shared and digested.

This programme currently has around 300 students involved, at various points in their studies. They come from a diverse set of nations, with 70 different countries represented worldwide. The materials used in the virtual classroom reflect the diverse nature of student experience, thereby drawing on international cases for example, and also are configured with the working professional in mind. The average age of students on this programme is the mid-thirties (compared for example with the on-campus student on the equivalent programme who will have an average age in their early twenties) and therefore while it is logical to expect individual experience to be brought into the seminar, it is noticeable that the pedagogy that underpins the programme insists on this to be necessary.

What this online, e-learning MSc OSCM programme represents is the demand for a particular type of student and a particular type of professional. In other words, there is a market demand for the skills and knowledge that the student is engaging with. While this might often be the reason behind the provision by HEIs for academic programmes it is not a necessity. This programme however, attracts an international student population that may well have experience in the field, but still require the broader theoretical understanding of SCM principles to be found in the provision from HEIs. This section of the article has introduced to the discussion on SCM education the potential of delivery in an e-learning format. We would suggest therefore that there is scope to provide this form of SCM education and there is a need to understand the pedagogy behind this.

4 The E-Learning Pedagogy for Postgraduate SCM

In the traditional classroom format students have come to expect knowledge to be transferred from books, articles and importantly, the academic into their own domain. The online MSc OSCM is different and in many ways represents the need to respond to the requirement for quality SCM education in a dynamic global environment and importantly, in a way that capture current knowledge, trends and practice in the field through the involvement of the student. A key difference therefore with traditional on-campus delivery is the deliberate involvement of students in this way, recognising their value to the field and bringing this into the learning method. In a traditional format this may happen, but generally such as approach will be incorporated by chance rather than by design.

In the MSc OSCM online classroom the mode of communication is asynchronous, again deliberate and necessary given the requirement to enable students to fit the demands of their learning into their work schedule. This is deliberate as it encourages practitioners to engage in postgraduate education in a manner they would struggle to do otherwise. The asynchronous mode also caters for an international community of academic staff and students who may be working in several different time zones. In simple terms, what we see at play is a particular type of learning that seeks to draw from student x aspects of SCM that would help student y learn. We can explore this by reflecting on two approaches that might be captured through e-learning, constructivism and collaborative enquiry.

According to Wilson (1996) constructivism describes the view of learning in which the students construct their own unique understanding of a subject, through a process that includes social interaction, so the learner can explain his or her understanding of the topic under study, and thereupon receive feedback from academics who we assume to hold the

knowledge. Collaborative enquiry via Internet-mediated communication provides a framework for the mode of learning (Stacey 1998). For example as all coursework, discussions, and group activities are completed in an asynchronous online environment students and academic instructors are able to collaborate over a specified period of time and while interactions are not real time, there exists space to reflect and to contribute. This mode of teaching requires a rigorous assessment criteria based on discussions that are a response to specified questions, levels of participation based on quality of contribution and not quantity of contribution (thereby requiring an academic judgment on student involvement), original assignments and individual or collective project work. Such an assessment platform provides the foundation to the pedagogy of the programme.

This facility, the virtual classroom or Virtual Learning Environment (VLE) provides chat rooms and discussion boards familiar to the online community and simple to use (cf. Lewis and Allan, 2005; Santy and Smith, 2007). However, this is about much more than the technology and the platform from which the delivery of learning materials can take place. As theory building and interaction increases, students eventually reach a stage of knowledge construction in which they are highly productive and collaborative learning begins – the ability to share differing views, personal experiences and abstract ideas develops. Through collaboration, socialisation and points of conflict students co-construct new knowledge about aspects of SCM under study. Both students and the academic instructor facilitate this, the latter coaching and guiding the former as and when the need arises. We can see this in the following brief extract from a typical MSc OSCM classroom the type of interaction that takes place.

Initially within the seminar, the Discussion Question is posed by the academic:

"Assess the importance of managers, both as the drivers of change and the obstacles to change, in the implementation of lean at Pratt. Support your answer with evidence from the case study"

This provides the platform from which we expect the student to respond:

Student 1: Initial Response:

"The strategic importance of management influence to the success of any Lean implementation can be deduced from all the case studies reviewed from the inception of this course. The case of Pratt (Womack and Jones, 2003 pp 153-188) is no different; instead we are better made aware of the gravity of management influence to any successful attempt on adopting Lean as a standard for operations. Principles 9 and 10 of The Toyota Way (Liker 2004 pp 169-184). As explained by Liker (2004) 'the leader's real challenge is having the long-term vision of knowing what to do, the knowledge of how to do it, and the ability to develop people so they can understand and do their job excellently'. This, he claims is the foundation for true and long-term success in any organization…

In conclusion, people are the bane of all organizational processes. They are required to make decisions, and run machinery needed to make the business work. Hence the right attitude to work predominantly determines the success of the enterprise. Managerial influence in the process of change could either make or mar the success of the improvement process. Having the right type of management to provide the needed vision and guidance and know-how from the top, whilst effectively building up employee motivation and participation is critical for the success of any improvement initiative.

What we witness typically, are aspects of theory for example 'the leader's real challenge is having the long-term vision of knowing what to do...' combined with initial reflection from own experience 'influence in the process of change could either make or mar the success of the improvement process...' and in this instance, some instance of anecdote borne perhaps out of frustration 'people are the bane of all organizational processes'. This lays the basis for an

initial response from another student in the classroom, who will have not met the original student other than in the virtual environment. As we see here:

Student 2:

"Leadership has been often listed as the most important driver of change within an organization. Just as leadership has been regularly identified as the driver of an organization that changes successfully, it is also often cited as the reason for failure. One of the most important things a leader can do is to actively participate in the change, or "walk the talk". However a leader who thinks that merely communicating the changes without action could be setting the company up for failure. As you mentioned, active leadership has been a theme in the case studies we have looked at:

Reference: Whelan-Berry, K.S. (2010) 'Linking Change Drivers and the Organizational Change Process: A Review and Synthesis', Journal of Change Management, 10(2), pp. 175-193

Witnessed here is the reaction, not in real time but after a period of reflection, to the initial post made by the original student. Challenging the anecdote and position of the original student, Student 2 seeks to provoke further thought 'leadership has been regularly identified as the driver of an organization that changes successfully...'

Further contributions will be made by other students or by the original student who responded to the question in a similar way. At some point the role of the academic instructor becomes more specific. He or she helps the student to synthesise the various contributions that are made. This design means that discussion is the best opportunity or tool that the academic has in terms assessing what is said; that is we see the co-construction of knowledge in respect of SCM and students understand their own responsibilities for learning. Students implicitly become more demanding while at the same time offer more in terms of ability to assist their peers, as they question their own thinking processes. This lays the foundation for an enhancement in their own level of skills and capability to understand. This interaction between students and their peers and between students and the academic, the process of learning, takes place in an environment of wider participation and the international mix of multiculturalism.

5 Concluding Comments

In this article we have here reported on our initial experiences from a wholly online MSc OSCM programme at the University of Liverpool. Although the programme is in its infancy to date, reactions from students and from the accreditation agency CIPS have been very positive. Contrary to many preconceptions, online learning, in the mode we have described, is very far from being an impersonal and alienating experience. We believe that both staff and students find it to be a stimulating and challenging mode of teaching and learning that has more in common with small-group seminar-based learning than it has with conventional lecture-based teaching and we might add, other methods of distance learning. In a programme such as this, many of the students bring to the classroom a wealth of SCM experience from their earlier studies and their professional life, often including knowledge outside the scope of their instructors. At the simplest level, simple queries about SCM are answered by other students under the guidance of the academic. Beyond this, the mediated classroom discussion provides a means in which students can share their broader knowledge with their colleagues, enriching the learning experience for everyone, with the added value of global classroom with SCM practitioners from multinational companies perhaps discussing with entrepreneurs or individuals working family run businesses.

The requirement for quality is evident in most if not all HEIs who deliver SCM education. Table 1 provided a sample of HEIs who are known in this area for providing a rigorous

academic product. Their provision is an outcome of the dynamics at play in the field of SCM. This has included the way in which the field has changed in recent decades and interestingly, the proximity to practice validated through the badge of accreditation. The professionalisation of this function, SCM, is a recognition of the way it has become integrated into broader aspects of management and overall, exposed to global trends in the commercial world. The quality requirement therefore has to reflect this in some way, and as we see in Table 1, the provision of core and elective teaching modules demonstrates this is being satisfied. Equally, we would argue that the virtual classroom offers the chance of internationalisation in ways difficult to replicate on-campus.

The structure for the delivery of this programme in this way involves the HEI and the partner organisation Laureate Online Education. Within this relationship there exists an infrastructure of student support and quality monitoring that for reasons of time and space, we have not delved into in this article. While these are essential in ensuring the quality of the programme, including the experience that any individual student will have as he or she progresses through the programmme, what we have sought to concentrate here are the needs for quality SCM education and whether the mode of delivery can satisfy, or even enhance, that quality requirement.

Looking specifically at the University of Liverpool MSc OSCM we described this wholly online initiative and looked critically at the pedagogy that lays the basis for this programme. There is, we believe, the environment in which a co-construction of SCM knowledge is enabled. In this way we have considered that learners are also able to actively contribute to a wider understanding of SCM theory and practice. The virtual classroom is pedagogically-driven; the conditions are created to examine theory, to share knowledge about practice, to synthesise knowledge about theory and practice in a collaborative manner in an international context and to apply this knowledge in an organisational setting in real time. However, the real message is that this environment is providing new and exciting ways in which learning is shaped and transformed.

References:

Allen, E., Seaman, J. (2008) "Staying the course: online education in the United States, 2008", The Sloan Consortium, November, available at: www.sloan-c.org/publications/survey/pdf/staying_the_course.pdf (accessed June 5, 2009),.

Arbaugh, J.B., Duray, R. (2002),"Technological and structural characteristics of student learning and satisfaction with web-based courses", Management Learning, Vol. 33 No.3, pp.331-47.

Bickman- Holmes, T, Hoffman, P. (2000) ‘ Elicit, engage, experience, explore: discovery learning in library instruction’, Reference Services Review, Vol. 28, No. 4 p313-322

Christopher, M. (1998) Logistics and Supply Chain Management, Pitman, London.

Dillich, S., (2000) "Corporate universities", Computing Canada, Vol. 26 No.16, pp.25-31.

Goffin, K., (1998) “ Operations Management teaching on Europrean MBA programmes”, Interantion Journal of Operations & Production Mangement Vol. 18, No 5, pp424-451

Gonzalez,M.E., Q., Gioconda, Gourdin, K., Hartley, M., (2008) “Designing a supply chain management academic curriculum using QFD and benchmarking”, Quality Assurance in Education, Vol 16 Issue: 1 pp36 - 60

Greasley, A., Bennett, D., & Greasley, K. (2004) “A virtual learning environment for operations management: assessing the student’s perspective”. International Journal of Operations & Production Management, 24(10), 974-993.

Gruengard, E., Kalman, Y., & Leng, P.H. (2000) “University education via the Internet: a new paradigm for public-private partnership”, in 'Innovation through Electronic Commerce' (Proc IeC ‘2000 Conference), ed. L Macauley, CeeC, Manchester, 46-53
Hayes, J., Bouzdine-Chameeva, T., Hill, A. V., Scavarda, A.J., and, Goldstein S.M., (2007) ‘Applying the Collective Causal ‘Mapping Methodology to Operations Management Curriculum Development. vol. 5 (2), 267-287,
Hiltz, S.R., Wellman, B. (1997) “Asynchronous Learning Networks as a Virtual Classroom”, Comm ACM 40(9), pp 44-49
Hitt, M.A. (1997) "21st century organisations: business firms, business schools and the academy", Academy of Management Review, Vol. 23 No.2, pp.218-24.
Hunt, D.V. (1996) Process mapping: How to reengineer your business processes. New York: John Wiley & Sons, Inc.
Joy, M., Luck, M. (1999) “Plagiarism in Programming Assignments”. IEEE Trans Education, 42(2) pp. 129-133
Lancioni, R., Forman, H., Smith, M., (2001) ‘Logistics programs in universities: stovepipe vs cross disciplinary’, International Journal of Physical Distribution & Logistics Management, Vol 31, No 1, pp: 53-64
Landry, B., Griffeth, R., & Hartmann, S. (2006) “Measuring student perceptions of BlackBoard using the technology acceptance model”. Decision Sciences Journal of Innovative Education, 4(1), 87-99.
Larreamendy-Joerns, J., & Leinhardt, G. (2006). Going the distance with online education. Review of Educational Research, 76(4), 567-605.
Lewis Allan, (2005) Virtual Learning Communities, A Guide for Practitioners Maidenhead, Open University Press (2005).
Lockyer, K.G., Oakland, J.S., Duprey, C.H. (1981) "UK managers are ignoring basic production techniques", Works Management, Vol. 34 No.4, pp.30-5.
Moisey, S. D. (2004) "Students with Disabilities in Distance Education: Characteristics, Course Enrollment and Completion, and Support Services." Journal of Distance Education 19(1): 73-91.
OBHE (2004) "Online Learning in Commonwealth Universities: selected data from the 2004 Observatory survey, Part 1." The Observatory on Borderless Higher Education - Observatory Briefings(20).
Oakland, J.S., Sohal, A.S. (1989) "The education, training, and career of production managers in British industry", International Journal of Operations & Production Management, Vol. 9 No.8, pp.63-90.
Persico, D., Manca, S. (2000) "Use of FirstClass as a Collaborative Learning Environment". Innovations in Education and Training International, 37,1, pp 34-41
Rosenberg, M. J. (2001) E-Learning: Strategies for delivering knowledge in the Digital Age. New York: McGraw-Hill, 2001.
Santy, J., Smith, l. (2007) Being an E-Learner in Health and Social Care – A student’s guide, Routledge, Abingdon, UK.
Scavarda, A.J., Bouzdine-Chameeva, T., Goldstein, S. M., Hays, J. M. and Hill, A. V., (2006) ‘Methodology for constructing collective causal maps’. Decision Sciences, Vol. 37 (2), 263-284,
Stacey, E. (1998) Learning collaboratively in a CMC Environment, in G. Davie s (Ed.), Tele-teaching ’98, Proceedings of the XV I FIP World Computer Congress, Vienna/Budapest, pp. 951 –960 (Austrian Computer Society).

White, D., Warren, N., Faughnan, S. and Manton, M. (2010) Study of UK Online Learning Final report, Technology-Assisted Lifelong Learning (TALL) Department for Continuing Education University of Oxford.
Williams, J S., Davis, P S., Black, L. "Subjectivities in School: Socio-cultural and Activity Theory Perspectives." International Journal of Educational Research Special Issue on Subjectivities in School: Socio-cultural and Activity Theory Perspectives 46 (1-2), (2007)
Wilson, B.G. (1996) Constructivist Learning Environments: Case Studies in Instructional Design. (New Jersey, Educational Technology Publications).
Winch, G., Carr, B. (2001) "Processes, maps and protocols: understanding the shape of the construction process", Construction Management and Economics, Vol. 19 No.3, pp.519-31.
Vine, P, Palsule, S (1999) "Corporate universities: back to school", The British Journal of Administrative Management, pp.18-21.