Accelerating Supply Chain Management learning: identifying enablers from a university-industry collaboration

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ABSTRACT

This paper presents findings from an exploratory case study of an Australian university-industry collaboration which aimed to accelerate learning within the emerging knowledge area of Supply Chain Management (SCM). The findings include an accelerated learning framework consisting of six constructs that influence the acceleration and integration of SCM learning at strategic and operational levels. This framework facilitates an examination of successes and shortfalls in the case study collaboration and generates a deeper understanding of critical elements for accelerating SCM learning. The conclusions include recommended actions to amplify successes and mitigate shortfalls in future university-industry collaborations for supply chain management learning.

Keywords: innovation; integration; knowledge management; learning; supply chain management

INTRODUCTION

If we are to maintain adherence to one of the key strategic management messages from the early part of the 21st Century – that Supply Chain Management (SCM) is a cornerstone of competitive advantage for firms (e.g. Cousins, Lawson & Squire 2006; Giunipero, Handfield & Eltantawy 2006; Thatte, Rao & Ragu-Nathan 2013; Vaidyanathan & Yadong 2007) – we must also seek to extend the boundaries of SCM knowledge and build the best platforms for the professional learning of future SCM practitioners. Aquino and Draper (2008) reported that new skills are required for the successful implementation of SCM strategies, and they supported the call for faster learning cycle times because of the increasingly complex nature of business environments. The recognised shortage of suitably skilled SCM professionals (e.g. Giunipero et al. 2006) has resulted in additional challenges for organisations wishing to gain competitive advantage by means of SCM (Ozment & Keller 2011). These demands for more SCM professionals who can demonstrate increasingly sophisticated levels of knowledge and skill require us to address the issue of how to most effectively plan and efficiently deliver learning for the SCM field.

This paper presents findings from a case study of an Australian university-industry collaboration which aimed to accelerate learning about and for SCM. Following a brief literature review, the paper outlines the research and then discusses the key findings, including an accelerated learning framework.
framework. The conclusion discusses implications of the enablers revealed through the framework, and offers some observations about how the framework could be used as a blueprint for university-industry collaborations in furthering SCM learning.

PERSPECTIVES FROM THE LITERATURE

Supply Chain Management Learning

Because SCM is not yet a discipline in its own right (Harland et al. 2006), it is not surprising that the fundamental aspects of what should be included in SCM learning remain unclear. For example, there are differences of opinion about how SCM should be defined (e.g. Ballou 2007; Chen & Paulraj 2004) and a growing unease (e.g. Ozment & Keller 2011) that this ongoing contestation could result in an unhelpful reductionism of SCM, such as considering it to be primarily logistics management, rather than encouraging and accommodating a more expansive evolution that better reflects its multidisciplinary nature. The present shortage of highly skilled SCM professionals adds to the risk that this kind of reductionist ‘SCM as logistics’ mindset will be reinforced, with negative implications for the competitive advantage that businesses could gain from other SCM dimensions such as supply chain integration, strategy formulation and relationship management.

It can be seen from the literature that a good deal of the research around supply chain learning has focused on individual supply chains (e.g. Defee & Fugate 2010; Spekman, Spear & Kamauff 2002). There has been far less research into learning that relates to supply chain management as a field of endeavour (Bessant, Kaplinsky & Lamming 2003). Ozment and Keller (2011) warn that formal programs in SCM are producing insufficient numbers of graduates to meet demands in the short to medium term.

More than a decade ago, Lancioni, Forman and Smith (2001) noted the limited amount of research into SCM program design and they indicated that this has acted as a barrier to the development of formal tertiary level programs in the SCM area. Adding to that, Giunipero, Hooker, Joseph-Matthews, Yoon and Brudvig (2008), reported that the key topics for SCM research in the decade up to 2006 included a continuing interest in ‘traditional’ areas such as quality; supplier development; and social responsibility, as well as a growing interest in the ‘newer’ areas of strategy; frameworks, trends and
challenges; alliances and partnerships; and the efficient exchange of information through Information Technology and e-Commerce. This list of SCM research areas does not include the area of learning. This omission is interesting given that, within that same time frame, professional bodies such as the Supply Chain Council were calling for actions such the clarification of SCM skills and competency requirements, agreement regarding a common model of Supply Chain Management roles, and development of the skills and attributes necessary to fulfil those roles (e.g. Aquino & Draper, 2008).

University-Industry Collaborations

The Lambert Review of Business-University Collaboration in the United Kingdom (HM Treasury 2003) reported that firms and universities are not natural partners due to differences in their cultures and missions. Specific aspects of industry-university interaction which are viewed in the broader literature as being problematic include poor accommodation by universities of structures and processes to properly embed work-based learning within their academic frameworks (Costley & Armsby 2008), and perceptions that universities are not matching the outcomes of their programs to the needs of business and society (Al-Turki, Duffiuau, Ayar & Demirel 2008; Sauber, McSurely & Tummala 2008; Business Council of Australia 2011).

The literature appears to show that the research into university-industry collaborations has been about collaborations involving traditional discipline areas or those that are easily measured, such as the hard sciences and technologies (e.g. Philbin 2012) rather than emerging areas. Factors further limiting this research include funding regimes (D’Este & Fontana 2007) and a relatively narrow spectrum of topic areas, such as intellectual property rights and the potential for commercial spin-off of technical innovations to sustain competitive advantage (Philbin 2008). In contrast to the limitations of the existing research agenda, a university-industry collaboration focused on SCM can broaden the research focus beyond the assumption that competitive advantage comes mainly from technological innovation. Furthermore, the collaborative context can help reduce the theory/practice divide by a process which encourages applied research to produce industry-relevant knowledge in shorter cycle times without compromising academic rigour. New knowledge generated by this research can be used to inform education and training, again within shorter cycle times. A process that can more quickly
generate, capture and distribute new knowledge is particularly important in emerging areas, such as SCM, which are striving to achieve clarity around foundational principles and practices.

RESEARCH CASE STUDY

Background to the Study

A medium-sized Australian university (Midstate University, or MU, in this paper) was approached by a large Australian national transport corporation (SuperTrans in this paper) to create a continuous ‘pipeline’ of suitably prepared SCM graduates who in the first instance could ‘hit the ground running’ and could subsequently, as part of a broader SuperTrans workforce development strategy, undertake various types of research to increase SCM knowledge transfer and innovation. In overall terms, then, the aim of the collaboration was to accelerate SCM learning.

The context surrounding this study was shaped by two key factors. First, it was the industry partner that instigated the collaboration. A senior executive from SuperTrans approached the university about being involved in the SCM learning and research plan outlined above. The first part of that involvement was to develop an undergraduate program in SCM that was well tailored to SuperTrans’ SCM needs, including a focus on strategic thinking and innovation. The senior executive continued to support the program’s development and implementation in a number of ways, including encouraging other large organisations to support the program and its graduates; critiquing program modules; providing scholarship funding; and arranging vacation employment for some students.

The second contextual factor was that just prior to the approach by SuperTrans, the university had been invited to join a small consortium of Northern Hemisphere universities which wanted to offer SCM education globally. The approach by SuperTrans helped MU to make its decision about entering the SCM area.

Research Methodology

The research described in this paper was an exploratory inductive case study. This research design was chosen because of its appropriateness in contexts that are not well understood (Yin 2003) or that lack agreed theoretical frames (Stake 2000), such as SCM. The research used a modified grounded
theory approach to explore the university-industry collaboration outlined earlier which aimed to accelerate graduate learning in the emerging, multi-disciplinary area of SCM. The case study focused on the first offering of the SCM undergraduate degree program that was developed as part of the industry-university collaboration. The main research question was:

What can we learn about the enablers for accelerating learning in the emerging knowledge area of SCM from a university-industry collaboration to prepare effective SCM professionals?

Data Collection and Analysis

Semi-structured interviews were conducted with the 21 final-year students in the first cohort, following their internship experience towards the end of the program, and four personnel from SuperTrans and MU who had played key roles in the collaboration. All interviews were recorded and verbatim transcriptions were produced. Additional sources of data included documents such as students’ learning journals, university unit descriptions and assessment outlines, and a written survey of the students immediately prior to the commencement of their internship. Using a modified grounded theory approach with particular emphasis on the constant comparison method (Corbin & Strauss 2008), an iterative process of simultaneous data collection and analysis was carried out.

FINDINGS AND DISCUSSION

Overview

Overall, the findings of this case study reveal that the first offering of the undergraduate degree program which was developed through the university-industry collaboration was generally considered a success by the organisations themselves and by the first cohort of graduating students. However, the specific successes identified in the data appeared in many instances to be overshadowed by associated tensions and shortfalls which pointed to difficulties with sustainability in the longer term. These tensions related primarily to unmet potential caused by ‘unsurfaced assumptions’, structural impediments and misalignment between strategic vision and resourcing at both the organisational and interorganisational levels. The main successes and shortfalls will be discussed in the sections that follow.

Supply Chain Management Accelerated Learning Framework
The data analysis led to the development of an accelerated learning framework (see Figure 1) which consists of six constructs influencing accelerated learning in this case study. The constructs, represented in Figure 1 by six blocks, are Strategic Coherence; Political Potency; Interorganisational Congruence; Structural Flexibility; Professional Commitment; and Interpersonal Acuity. Three of the constructs exert their strongest influence in strategic aspects of SCM learning while the influence of the other three is strongest for operational aspects. Each construct comprises two or three critical elements which define it and describe the basis of its influence within the framework. There are 13 critical elements in total, four of which are found in more than one construct. These four ‘shared’ elements, presented in Figure 1 as shaded rectangles with a dotted line showing their connections, are: capacity to surface and interrogate assumptions; commitment to proactivity and innovation; ability to negotiate, influence and manage relationships; and perceptions of ownership and responsibility. They will be discussed in more detail later in the paper.

(Place Figure 1 about here)

**Constructs with Strongest Influence at the Strategic Level**

There was evidence in the data that, without a strong cross-sectoral foundation for collaborative activity, it would be difficult to sustain accelerated SCM learning. The critical elements of the Interorganisational Congruence, Strategic Coherence and Political Potency constructs were identified in the data as being important for establishing a stable base on which to both build and accelerate SCM learning. As can be seen from Figure 1, ‘capacity to surface and interrogate assumptions’ is a critical element shared by two of the constructs influencing the strategic level of the framework. It was clear from the data that unsurfaced assumptions and unmet expectations were the cause of many of the tensions and missed opportunities identified in the case study. For example, the SuperTrans senior executive expressed some surprise at the university’s lack of proactivity and strategic capacity, and this would indicate an assumption on the part of SuperTrans that MU would demonstrate greater competence in these areas.

*I did a lot of background strategic work – interestingly, work I thought the university would have done but they didn’t … I got all this data together, gave a presentation to the [Faculty Advisory] Board on the whole graduate shortage and skill shortage across Australia at the*
time which was pretty critical, and I therefore positioned it on this presentation — why this was so important, why there was going to be a skill shortage, why industry had to reach out to more people and why I felt there was a lot of potential for [MU], if it could position itself first, to get their ‘first mover’ advantage (SuperTrans Senior Exec WV: 22 & 25).

With respect to Strategic Coherence, a number of interviewees’ comments highlighted the need for visionary leadership in business organisations and in the university sector if the SCM agenda is to be clarified and expanded. The value was acknowledged of SuperTrans having shown leadership by wanting to progress a professional learning vision for SCM that was broader than simply developing an undergraduate degree program. However, the senior executive from SuperTrans expressed the view that visionary leadership for SCM was not actually widespread within his organisation, saying ‘If you look at the instruments that come out of the Board at SuperTrans and if you look at their strategy documents, they really say a few token words but there’s not much action there’ (SuperTrans Senior Exec WV2: 26).

In relation to the Political Potency construct, and particularly for matters of agenda and influence, many of the comments made by the non-student interviewees referred either directly or indirectly to the current state of the SCM agenda, including mixed reactions to the roles played by relevant professional bodies such as the United Kingdom’s Chartered Institute for Purchasing and Supply (CIPS) and its Australian counterpart, CIPSA. There were also references made to the difficulties experienced, both for individuals and organisations, when attempting to collaborate in a contested field where a good deal of the energy that might otherwise be harnessed for building knowledge and providing clarity was being diverted to jockeying for control of the professional agenda. A number of comments implied that for organisations to work effectively in such a space, their representatives needed to be of sufficiently high status and to have effective skills for influencing and negotiating. Data related to the critical element of ‘perceptions of ownership and responsibility’ came from both the student and non-student interviews. In speaking about their internship experience at SuperTrans, many of the students raised the issue of wanting to be given responsibility for ‘real’ work. This was
generally linked to a sense of feeling like a professional ‘insider’ making a worthwhile contribution to the organisation. For example, one of the students said, ‘During the holidays I actually did four weeks of experience at SuperTrans as a graduate supply chain officer within the Supply Division. So when I started my internship I already knew the organisation. I knew the people up there and what they were doing. So it kind of gave me a head start and they knew me, which is also important’ (Student NM2: 1). The non-student interviewees were very clear in their comments that a strong commitment was needed from experienced practitioners and senior managers across organisations to contribute directly to professional learning programs and take responsibility for developing future cohorts of SCM practitioners.

With respect to Interorganisational Congruence, the data showed that a history of previous links between MU and SuperTrans (e.g. through research projects and advisory board representation) was helpful in the collaboration, and that there was some degree of shared vision through a mutual desire for the undergraduate SCM degree program to be effective. However, there was a strong message from non-student participants of apparent differences in the extent to which the two organisations demonstrated proactivity in developing the collaboration, setting a context for sustainability, and implementing the SCM learning program. The capacity to examine assumptions is an important part of this construct. For example, the SuperTrans senior executive assumed the university would have expertise in facilitating deep learning for students and would show some capacity for being innovative in managing program delivery. These expectations were not well met. From the students’ perspective, too, it was clear that there were unmet expectations about the purpose and implementation of their internship at SuperTrans which can be directly linked to unexamined assumptions and inadequate communication about the differences in internship models. For example, some students did not view their research task in SuperTrans as ‘work’ and appeared to feel ‘cheated’ out of a work opportunity, as seen in the following comment from a student: ‘I really haven’t been doing any work per se. I’ve more been doing interviews with a lot of the design team and upper levels of management and also conducting interviews with the guys out at [name of site]’ (Full-time student UT2: 2).
Constructs with Strongest Influence at the Operational Level

The data analysis showed that the critical elements within the Structural Flexibility, Interpersonal Acuity and Professional Commitment constructs were important for building a sustainable level of input by academics and industry practitioners to the design and delivery of programs and research projects to support SCM learning.

In relation to the Structural Flexibility construct, both academic and practitioner interviewees reported instances where willingness and capacity to quickly step outside an organisation’s ‘standard operating procedure’ provided good results – for example, a successful process being established (vacation employment for a group of students) or an emergent problem being solved (rescuing the internship program by hosting the entire student cohort). On the other side of the flexibility coin, both the student and non-student participant groups raised a number of concerns about how an absence of structural flexibility had some detrimental effects on the students’ learning program and on aspects of the university-industry collaborative process. Most, but not all, of the criticisms about a lack of structural flexibility were directed at the university and it may be the case that some of this rigidity is due to the quality assurance requirements imposed on universities through external bodies such as the Tertiary Education Quality and Standards Agency (TEQSA). A clear example of MU experiencing challenges around commitment to innovation and the capacity to act on feedback can be seen in comments from both student and non-student participants that highlight the university’s struggle to respond adequately to the request from SuperTrans that strategic thinking and innovation be included as key aspects of the SCM program.

With respect to Interpersonal Acuity, all four non-student participants, and many of the students, were clear in identifying effective interpersonal skills as being a critical attribute for SCM professionals. At the same time, there was a consistent acknowledgement from the non-student participants that interpersonal, or ‘soft’, skills are difficult to teach, particularly in academic settings. This clearly poses a challenge for the design and delivery of highly effective SCM education programs. For the industry-university collaboration itself, the data showed that the history and the quality of the
interpersonal and professional relationships among the key people from SuperTrans and MU were critical to the positive outcomes that were achieved. There was also evidence that students’ personal and work history played a role in how they were able to engage with the learning program, particularly the internship. One of the industry practitioners who delivered part of the academic program commented during his interview that, had he known earlier about aspects of the students’ backgrounds that had direct links to SCM contexts (for example, individual work history and involvement in family businesses), he could have tailored his teaching around that in order to accelerate learning.

In considering the influence of the Professional Commitment construct, comments made by the university and industry participants revealed their own high levels of interest in professional learning. These participants also expressed strong views about the value of SCM to business success, and about the willingness of practitioners in general to be closely involved in the development of future SCM professionals. Once again the importance of SCM professionals having strong influencing and negotiating skills was highlighted. From the perspective of the student participants, there were consistent messages of appreciation about specific individuals from both the university and business contexts making a positive impact on their learning and taking a genuine interest in their progress. By contrast, a handful of students commented less favourably on the performance of some university staff who they perceived to be lacking interest or expert knowledge in the subjects they were teaching.

A Focus on the Four Shared Elements

It was noted earlier in this paper that four of the critical elements – capacity to surface and interrogate assumptions; perceptions of ownership and responsibility; commitment to proactivity and innovation; and ability to negotiate, influence and manage relationships – contributed to more than one construct. This suggests that they may be of a different order to the other nine critical elements in the framework and may warrant additional attention as a result. Moreover, the first two elements in the list above are influential at both the strategic and operational levels of SCM learning. When considered together as a ‘set’, the four shared elements may be seen as the supporting pillars of an overarching blueprint of
how SCM learning could be accelerated by means of industry-university collaboration. These pillars would suggest that the collaborating organisations, and their agents, need to:

- accept ownership and ongoing responsibility for the development of SCM learning
- be proactive and committed to innovation
- spend time preparing the ground for the collaboration by declaring and interrogating assumptions about capacity, expertise and resources
- have a degree of influence within the field to manage relationships and negotiate as required

CONCLUSIONS

In functional terms, the collaboration between the university and the transport corporation was harmonious and positive and, from that perspective, the findings clearly affirm what is already known about the importance of developing trust among key individuals from the partner organisations being central to effective collaboration. However, with respect to assumptions, expectations and ‘deliverables’ from the collaboration, the picture is less clear. While the industry partner had been seeking to move the SCM learning agenda into new space, the university showed little propensity to interrogate the strategic implications of entering into the SCM field or to consider the different resources that may be required to manage teaching and research activity in this emerging area. For example, MU’s responses to addressing the multidisciplinary nature of SCM and to the request for innovation within the program were both conventional and, from SuperTrans’s perspective, less than satisfactory. While it should be acknowledged that there are requirements imposed on the University sector for program and course development, there appeared to be little effort by MU to even investigate alternative and innovative processes.

The framework presented in this paper goes some way to identifying critical success factors for alliances and partnerships aimed at accelerating learning in an emerging body of knowledge. Using the framework as a blueprint for future collaborations suggests that university-industry partners would need to take the following actions.

1. Undertake a detailed exploration of the tacit assumptions held by each party in order to develop a strategic plan for governing how the collaboration will work. It was clear that in
this case study the complex, systemic and multi-causal nature of factors impacting the university-industry interface were not well understood by either party. The university’s oversimplification of the intent of the collaboration was demonstrated by its reverting to a standard institutional response of ‘business as usual’ despite entering a new field of endeavour and SuperTrans pushing for an innovative solution. SuperTrans, by contrast, overestimated the university’s innovative capability, strategic capacity, and flexibility.

2. Formalise the governance and operational arrangements of the collaboration. The collaborative process in this study was undertaken largely at an interpersonal level rather than through formal institution-to-institution mechanisms. There was some unevenness in the organisational status of key individuals and the extent to which they had institutional authority to make strategic decisions and commit resources. The recommended formalisation should also extend to a mutual understanding of the constraints each organisation faces such as requirements for program quality standards and the capacity to undertake internships.

3. Explore university sector policy and process reforms. This study showed that rigid structures and practices in universities continue to pose considerable challenges to the teaching and learning of knowledge and skills for multidisciplinary and transdisciplinary fields such as SCM. The influence of the current university funding system in Australia would appear to be instrumental in this dilemma. Although the university in this case study wanted to become involved in SCM education precisely because of its potential as a new area, it seemed ill-equipped to move outside the standard model of a modularised program under the control of a single faculty with adherence to formulaic staff-student ratios.

4. Renegotiate industry’s responsibility in SCM learning. The data in this study aligns with an increasing body of SCM literature which is stressing the need to give greater prominence to the development of ‘soft’ skills. By their very nature these skills are best learnt within a work-based context and are not well suited to assessment by traditional university assessment methods. As it is industry which has both the best leaning context for acquiring ‘soft’ skills and the most compelling case to have a work force which has acquired them, it falls on industry to play a greater role in the development of competent SCM professionals.
REFERENCES


Figure 1: Supply Chain Management Accelerated Learning Framework

Set a strong and sustainable cross-sectoral foundation to support SCM learning

Sustain academic and practitioner input to design and delivery of SCM (a) learning opportunities and (b) research activities

**INTERORGANISATIONAL CONGRUENCE**
- Capacity to surface and interrogate assumptions
- Shared vision
- Commitment to proactiveness and innovation

**STRATEGIC COHERENCE**
- Capacity to surface and interrogate assumptions
- Clarity of strategic vision and focus
- Alignment of strategy and resources

**POLITICAL POTENCY**
- Agenda transparency
- Organisational power and influence
- Perceptions of ownership and responsibility

**OPERATIONAL**
- Commitment to proactiveness and innovation
- Organisational agility
- Organisational capacity to act on feedback

**STRUCTURAL FLEXIBILITY**
- Personal history and experience
- Ability to negotiate, influence and manage relationships

**INTERPERSONAL ACUTITY**

**PROFESSIONAL COMMITMENT**
- Ability to negotiate, influence and manage relationships
- Ability to negotiate, influence and manage relationships
- Belief in importance of SCM as a profession
- Perceptions of ownership and responsibility