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Logistics and Supply Chain Education and Jobs: A Study of UK Markets

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Abstract

Purpose - This paper examines the curriculum design of logistics and supply chain management (LSCM) undergraduate courses offered by selected UK higher education institutions and compares them with employers' job requirements in the UK.

Design/methodology/approach - Desk-based research involving content analysis of 22 selected undergraduate LSCM courses from 18 UK higher education institutions and job advertisements from an online recruitment website during twelve weeks in 2011-12.

Findings - In general, LSCM recruiters highlighted the importance of professional skills and general management knowledge rather than specific LSCM subject knowledge. Work experience is important even at the entry level. As the roles become more senior, as indicated by higher salaries, more LSCM subject knowledge and work experience is required. The findings indicate an imbalance between the undergraduate curriculum and employer needs. Only some of the LSCM undergraduates programmes investigated provided such a balance of curriculum design.

Research limitations/implications - This paper is based on published information in websites and also job adverts. More studies of the detailed syllabuses for the courses and the overall learning experiences of students are required.

Practical implications - This paper highlights the importance of general managerial skills and professional skills to meet the needs of employers. Graduates are expected to be able to manage and acquire additional LSCM knowledge when required indicating the importance of continuing professional development.

Original/value - Themethodologyofthispapertakesadvantageoftheavailabilityofup-to-date'live'dataviatheInternet.Asaresult,this study provides new insights into the LSCM employer requirements for three salary brackets, from entry level to senior level, and it indicates the 'right' balance of curriculum design for LSCM graduates in the present days.

Keywords: Logistics management, Supply chain management, Undergraduate education.

1. Introduction

While logistics and supply chain management (LSCM) promote cross-functional process integration, many universities are still struggling to redesign their curriculums to reflect such complexity. Another problem is that there are different views regarding the appropriate balance between subject knowledge and general management skills required for LSCM graduates (Murphy and Poist, 1991; Gammelgaard and Larson, 2001). From an employer's point of view, strategic LSCM skills are becoming crucial (Cruz, 1997; Giunipero and Dawn, 2006). Consequently, the job markets are adapting to these changes by changing its graduate selection criteria. This paper explores whether or not university curricula have kept up with thesechangesandaremeetingtheneedsofemployers.

LSCM courses are still perceived to over-emphasise logistics or procurement contents with an SCM banner on themattheexpenseofgeneralemployabilityskills. employers still complain about the lack of communication skills, analytical skills and various personal qualities of LSCM graduates (Sodhi et al., 2008). Thus, even though recent graduates are stronger than in the past and the business curriculum is considered to improve students' verbal and problem-solving skills, they are still perceived to have failed to meet employer expectations (Sneed and Morgan, 1999). Employability is becoming more important for graduates as there is increased competition for vacancies and many leave higher education with higher debts than in the past. Universities offering LSCM courses should therefore identify such emerging requirements from the job market and redesign their courses.

This paper ask the question: do current undergraduate LSCM courses in the UK meet the Demands of employers for graduates with a particular knowledge and skillset? It examines the skills and knowledge provided by selected undergraduate LSCM courses in the UK and compares them with the requirements specified in the job advertisement from the UK job market. The curriculum designs of 22 undergraduate LSCM courses offered by 18 UK higher education institutions are examined and the different knowledge and skills are categorised and quantified. Similarly, the job requirements during November 2011 to February 2012 from the website of Supply Chain Recruit (http://www.supplychainrecruit.com/) are analysed. This exercise is useful because it adds insights to similar previous studies (e.g. Murphy and Poist, 1991 and 1994; Giunipero and Dawn, 2000; Gammelgaard and Larson, 2001; Handfield,

2004; Myers et al., 2004; Mangan and Christopher, 2005; Sodhi et al., 2008), which are now outdated.

This paper provides the following unique contributions. It helps to clarify the debate over the need for more specialist subject and analytical knowledge over managerial skills as posited by Sodhi et al. (2008) and identifies the academic disciplines, as well as skills, that enable graduates to function successfully in the workplace in the LSCM sector. The paper also addresses a major weakness of the previous studies mentioned earlier (e.g. Gammelgaard and Larson, 2001; Murphy and Poist, 1991), which is the lack of ~~clarify~~ clarity of the knowledge and skills requirements for different salary brackets. By analysing job advertisements from three salary brackets (£18-30k, £30-40k, and £40-100k), this study also provides a novel understanding of the different requirements in terms of the emphasis on managerial skills compared with LSCM subject knowledge. This approach to data collection means that our study is based on 'live' data and accurately reflects the situation with respect to the demand and supply of LSCM graduates. Finally, it helps to clarify the notion that LSCM graduates who aspire to become senior logistics executives must be good managers first and foremost, and logisticians second (Murphy and Poist, 1991).

2. Literature review

2.1 LSCM higher education curriculum design

LSCM education has changed over time and matured into a discipline of integrated logistics (Bowersox, 1969) and nowadays supply chain management. The integrative orientation of LSCM education has been further expanded largely due to the need to produce graduates who not only understand logistics operations but are also able to integrate logistics with other functions. For example, a study involving eleven major European universities by Chikan (2001) found curriculum which attempted to integrate logistics with subjects such as production and purchasing operations. During the 1990s, Michigan State University created a single integrated department which comprised of marketing, procurement, production and logistics disciplines, and offered courses which integrated these disciplines together (Closs and Stank, 1999).

Throughout this time there have been ongoing debates on the appropriate skills and knowledge for logistics graduates. A Scandinavian model developed at Tromsø University College divided logistics syllabus into six major problem areas – problem-based learning, supply chain management, national transport, international transport, customer service, and forwarding (Alvarstein and Johanesen, 2001). The European Logistics Best Practice project (BestLog) divided logistics curriculum into nine fields - business functions, personal skills, scientific basics and tools, general management skills, logistics operations, logistics planning, logistics concepts and tools, logistics support, specific areas of application (BestLog, 2007). There was one suggestion to include customers, purchasing, operations management, and partner relationships network management into logistics and supply chain courses in the USA (Ang et al., 2010) and another to separately teach subjects such as supplier relations, purchasing, production, distribution, customer relations, information, physical handling, and then deliver a course to integrate these subjects (Chikan, 2001). Michigan State University divided their courses offered into 3 levels: basic awareness, core knowledge, and detailed application, where there is an opportunity for students to learn to integrate all knowledge and skills together to solve practical problems (Closs and Stank, 1999). In summary, different educational institutions have taken different approaches to both defining the subject of LSCM and also teaching it either as a series of separate topics and then integrating them, or through an integrated curriculum.

2.2 Skills and knowledge required by employers

Employability has become a very important selling point for business and logistics education programmes. Generally, business graduates with scholastic capital, social capital, cultural capital and inner-value capital are found to have achieved higher self-efficacy, salary, intrinsic and extrinsic outcomes during their employments (Baruth et al., 2005). Various studies into the skills and knowledge required for business and management, and LSCM graduates suggest that academics and practitioners appear to agree that the job markets prefer graduates who have the right subject knowledge, general business and management skills , and personal qualities such as responsibility, honesty, accountability, and ethical values (Gammelgaard and Larson, 2001; Sodhi et al., 2008).

The views of employers reported in existing studies are particularly useful. A factor analysis of survey data of 123 Council for Logistics Management (CLM) members suggests three categories of SCM competencies: (1) interpersonal or managerial basic skills, (2) quantitative

and technological skills, and (3) SCM core skills (Gammelgaard and Larson, 2001). This study provided a list of skills for logistics and supply chain managers - teamwork, problem solving, supply chain awareness, ability to see the big picture, listening, speaking/oral communication, prioritising, motivation, cross-functional awareness, leadership, decision-making, critical reasoning, written communication, time management, confidence, self-discipline and change management (Gammelgaard and Larson, 2001). Another study based on 15 practitioners by Gammelgaard and Larson (2001) identified a slightly different cluster of skills which included the ability to perform under pressure. Dividing logistics and supply chain skills and knowledge into three categories, Murphy and Poist (1991) found that management skills (e.g., motivation, planning, organising, etc.) emerge as the most important component for senior logistics executives, next was logistics skills, and last business skills. This finding implies that senior logistics executives must be good managers first and logisticians second.

Although the academic literature has identified specific knowledge and skills, there is a lack of clarity about the job markets' priorities and the required combinations and balance of skills and knowledge. Sometimes academics and students mistakenly consider problem solving, decision-making, time management, critical reasoning as skill sets more important than communication skills (Tanyel et al., 1999; Gammelgaard and Larson, 2001). Instead, communications skills have long been widely recognised as one of the most important skill sets for business and logistics graduates (Raymond et al., 1993; Aiken et al., 1994). In ~~a~~ one study, only a few students were able to accurately rate past experience and communication skills as the top factors in employability (Briihl, 2001). It is also argued that some other skill sets, instead of education and experience, are the determinants of employee's performance. Myers et al., (2004) identified that skill sets such as social, decision-making, problem-solving and time management were positively related to employee's performance, but education and experience were not.

An alternate view is that strategic skills, as identified by Cruz (1997), are more highly desired by many organisations (Giunipero et al., 2006) rather than generic managerial skills. For example, senior managers in the USA cited access to individuals trained in integrated SCM as their major concern for the future (Closs and Stank, 1999). Senior logistics and supply chain executives are expected to build up strategic relationships, achieve total cost and strategic cost reduction, and enable collaboration and integration with suppliers (Giunipero et

al., 2006). To achieve the above strategic objectives, Giuopero et al. (2006) concluded the required top five skills areas as team building, strategic planning, communication, technical, and financial.

In terms of subject knowledge, the Sodhi et al. (2008) study based on job advertisements suggests that subject knowledge such as sourcing, supplier management, inventory and forecasting are equally or more important than general business and management skills such as communication and leadership skills for MBA graduates specialised in LSCM. Supply management skills are emphasised here due to the fact that individuals with a solid knowledge of financial income statements, balance sheets, and the mechanics of financial accounting would be required to establish the business case for sourcing strategies (Giunipero et al., 2006). Project management, team-related skills, inter-personal skills, general analytical skills with a focus on problem solving were found to be less important than subject knowledge. Other subject knowledge identified include information and electronic mediated environments, marketing and channel restructuring, transportation and logistics, metrics and performance, service and after-sales support.

A survey by Skills for Logistics (2010) indicates that skills and knowledge about fuel efficiency or alternative fuel sources, eco-driving, carbon management and accounting and application of environmental awareness will receive a greater attention in the future. Seeking a more 'balanced' model, Sodhi et al. (2008) argued that there may be an undersupply of practice- or process-oriented topics and there may be an oversupply of conceptual and strategy-oriented topics, as opposed to the argument of Closs and Stank, 1999 and Giunipero et al. 2006). It is also argued that most logistics programmes fail to accurately reflect the international setting and the multi-disciplinary nature of supply chain management (Lancioni et al., 2001).

In summary, the literature indicates there are still different views about the content and relative balance of knowledge and skills in the academic curriculum for LSCM and there is limited empirical evidence available to support curriculum design. In addition, many studies ignored the importance and relevance of personal qualities. Perhaps this is one of the reasons that education provision is still perceived as failing to meet employers' expectations (Sneed and Morgan, 1999). Instead of arguing that employers provide vague descriptions of the skills and knowledge they expect in new employees (Sneed and Morgan, 1999), there is a need for

education institutions to carefully understand employers' perspectives and to look at the whole person - knowledge, skills and personal qualities.

3. Research Methodology

The aim of this study is to examine the curriculum design of logistics and supply chain management (LSCM) undergraduate courses offered by selected UK higher education institutions and compares them with employers' job requirements in the UK. This study analyses (1) selected undergraduate-level LSCM courses offered by UK universities and (2) job advertisements within this field.

3.1 Analysis of LSCM courses

The relevant LSCM courses were identified from Universities & Colleges Admissions Service (UCAS) which provided access to authentic, reliable and relevant data required for satisfactory content analysis (Cullinane and Toy, 2000). This source was used as it is a nation-wide student application system subscribed to by all UK higher education institutions. Using this source enabled us to be confident that we identified all current LSCM courses in the UK. Eighteen out of 300 higher education (HE) institutions in that UK provide around 59 (see Table 1) undergraduate courses in the field of logistics and/or supply chain management, including some pre-degree, i.e. foundation degree (Fdg) or foundation science (FdSc) programmes (UCAS, 2012). Altogether, 16 universities, 1 college, and 1 other higher education institutions were selected for this research. Together they provide 44 full-time 3-4 year Honours BA or BSc LSCM courses and 15 full-time 1-2 years of Fdg/FdSc, Honours BSc/BA or Diploma/Diploma HE LSCM courses at varying tuition fees as of February 2012.

Insert Table 1 here

Out of the opportunistic samples of 59 courses we examined the 22 programmes that provided detailed course information on their websites, performing a detailed examination of the curriculum and classified the content into six categories of knowledge and skills (see Table 2). Such a coding scheme was based on a theoretical framework (Guthrie et al., 2004), which include pedagogical viewpoints the categories of knowledge and skills required for LSCM graduates~~,~~–. The coding scheme, presented in Table 2 is similar to those used in previous studies (e.g. Murphy and Poist, 1991; Gammelgaard and Larson,

2001). Further, LSCM courses offered by UK institutions typically cover these six categories and therefore the use of a coding scheme very close to the structure of the dataset helps to ensure validity and reliability of the content analyses.

Insert Table 2 here

We further calculated the number of credits allocated to each category of knowledge and skill for each programme so that we could compare the percentages of credits. Since all UK HE institutions provide 360 total credits for undergraduate programmes we could compare the credit allocations of each knowledge and skill category among different programmes. We also examined the contents of the courses qualitatively. We argue it is imperative to reveal the knowledge and skill portfolio of undergraduate leavers based on the above qualitative and quantitative analyses.

3.2 Analysis of LSCM jobs

The UK logistics sector was valued at US $105.7 billion in 2010 and grew by 9.9% during 2009-10; the sector is estimated to grow at a CAGR of 5.5% during 2010-14 (Datamonitor, 2011). In 2010, the UK's top 50 logistics firms enjoyed increases in both operating profit and margin (Grant Thornton, 2011). According to the UK Higher Education Statistics Agency (HESA, 2011), the employment rate by subject area indicates that 75.9% graduates from business and administration studies are in employment. All these are positive signs for the development of business and management studies in general.

In order to understand the knowledge and skills required in the logistics and supply chain industries and their job markets, previous researchers have used a range of approaches including surveys, interviews and focus groups (Murphy and Poist, 1991 and 1994; Gammelgaard and Larson, 2001; Myers et al., 2004; Giunipero et al., 2006; Skills for Logistics, 2010) and also the examination of job advertisements (Sodhi et al., 2008). We chose to analyse current job advertisements from November 2011 to February 2012 for the following reasons. First, our goal here is not just to reveal the required knowledge and skills; we also aim to reveal the different levels of knowledge and skills required by jobs at different salary levels, i.e. £18,000-£30,000; £30,000-£40,000; £40,000-£100,000 annually. Second, examining advertisements in the job market allows us to access to a large sample of employer

requirements. Third, examining current job advertisements over several months allows us to understand the latest job requirements instead of the reflective and possibly subjective accounts of the job requirements from interviews or similar data collection methods.

In order to achieve the above benefits, we chose to examine graduate LSCM job advertisements from the online job marketplace called Supply Chain Recruit (http://www.supplychainrecruit.com/). Job advertisements during the twelve week period identified above were collected and during that time there was an average of 748 advertisements per week for job vacancies with a range of about 800–1000 advertisements per week. From that twelve-week period, we selected and analysed in detail 20 advertisements for each of the salary brackets. We examined the types of LSCM job vacancies and job demand as well as the type of knowledge and skills the employers are seeking for the three salary brackets in the country. This was accomplished by analysing the contents of the job descriptions that were included in the advertisements and coding of the categories of knowledge and skills in an inductive manner. We then compiled the examples and definitions for each category of knowledge and skills for each salary bracket in order to identify similarities and disparities among the salary brackets. We then used the results to critically compare the LSCM courses offered by selected UK higher education institutions.

The major limitation of our approach is that the reliance on secondary data does not allow us to perform in-depth analyses of the rationales and reasons behind the course contents and skills requirements in the job advertisements. However, our methodology enabled us to compare what is being offered (supply of new graduates) and what companies want (demand). The timeline of our study means that we have provided an up-to-date analysis of the supply and demand for LSCM graduates using live data. This provides a valuable data source for the analysis of the supply and demand for new graduates within the LSCM industry.

4. Findings

4.1 Content analyses of LSCM courses

Our analyses provide some interesting findings. Figure 1 depicts the course breakdowns and credit allocations for the 22 selected LSCM study programmes. Generally most programmes

attempt to cover specific LSCM contents (LO) as well as other knowledge and skills. Some study programmes choose not to include finance and accounting (FE) subjects, dedicated leadership skills (LD) module and the traditional dissertation projects (DP). More interestingly, in terms of the credits for LSCM subject knowledge (LO) and professional skills (PG), there are two extremes. For instance, programme number 2 (BSc Business Purchasing and SCM) provides only 8% (30 credits) of logistics subject knowledge (LO) but allocates many more credits to professional skills (54%), general management (29%), and leadership skills (9%). Nevertheless, programme number 10 (BSc Maritime Business and Logistics) puts more emphasis on the LSCM subject knowledge (200 credits or 56 %), and allocates less credits to general management subjects (22%), finance and accounting (11%), professional skills (5%) and dissertation and independent studies (6%).

Insert Figure 1 here

Other than the above two extreme cases, most programmes appear to have allocated between one-third and two-thirds of the credits to logistics subject knowledge (LO). Those programmes with relatively more credits in logistics subjects (LO) and business and management subjects (BM) offer relatively less credits in professional skills (PG) - in most cases only 10%-20% of the total credits. In summary, it appears that the structures of LSCM programmes vary greatly depending on their host institutions. Figure 2 summarises the average credit allocations for all the programmes we examined. On average, logistics subject knowledge represents 42% of the credits, followed by business and management (24%), professional skills compiled (20%), finance and accounting and dissertations and independent studies (about 7% each) and finally only about 2% dedicated to leadership skills.

Insert Figure 2 here

4.2 Content analyses of LSCM jobs

The examination of selected job advertisements during the twelve weeks led to the division of six categories of knowledge and skills or requirements: (1) formal or professional qualification, (2) subject knowledge, (3) work experience, (4) practical or professional (transferrable) skills, (5) intellectual skills, and (6) general management plus leadership skills.

Jobs advertised at salary bracket £18-30k, a typical new graduate salary level, are for example stock/inventory controller, transport controller, goods inwards leader, technical buyer, supply chain analyst, materials expeditor or planner, expeditor, delivery coordinator and assistant procurement officer. In one of the advertised transport-related jobs, applicants are expected to have experience in transport operations, a good understanding of multi-drop operations, an excellent understanding of transport legislation, transport management software, and experience of working in a unionised environment – these are largely subject knowledge and work experience and some degree of practical or professional skills. Applicants are also expected to have a customer focus. Such a job also requires a professional qualification or Certificate of Professional Competence (CPC), or an undergraduate degree.

We also measured the number of times a knowledge and skill category is mentioned in each job advertisement. For jobs at salary bracket £18-30k, two categories – practical/professional skills (31%) and general management and leadership skills (22%) – occupied half of the advertisements; these include skills in documentation, communication, supervision, organisation and leadership. Subject knowledge (18%) and work experience (18%) contributed to over one-third of the advertisements. Applicants are basically expected to understand and able to manage key LSCM processes and have some basic knowledge of typical software tools and systems such as MRP, Paragon, etc. In terms of qualifications (11%), it is interesting to find out that graduates are competing for these jobs with those with lower qualifications including professional qualifications and high school level qualifications. Surprisingly, intellectual skills (<1%) was not mentioned as frequently as other categories.

In the salary bracket of £30-40k there are additional requirements. Nonetheless, these positions varied depending on size and type of organisation, e.g. domestic or international company. In this salary bracket, vacancies such as S&OP demand planner, procurement project manager, procurement buyer, indirect services buyer, packaging and ingredients buyer, global procurement analyst and senior buyer are advertised. Furthermore, the duties varied from being responsible for a specific range of suppliers and components or building sustainable relationships with suppliers to maintaining master data (e.g. Manugistics), or updating and analysing sales history. Further, at least 2-3 years of experience working in very similar field was required in some jobs. Other skills required are, for example, excellent supplier management and internal stakeholder engagement skills, understanding of full buying lifecycle including supply chain, working knowledge of sourcing software. In some

instances, the majority of employers expect applicants to have certificates such as Member of the Chartered Institute of Purchasing & Supply (CIPS).

The jobs in the £30-40k bracket require different sets of knowledge and skills than those earning basic salaries. There are two leading categories: experience (27%) and general management (25%) which together encompass 52% of the requirements. This includes senior level positions in freight forwarding and warehousing, excellent working knowledge on ERP/MRP systems as well as strong leadership skills or a proven track record of organisational skills. Slightly lower positions highlight three categories; formal/professional (14%), subject knowledge (11%) and practical / transferable (16%) including such as skills as degree qualification, professional logistics qualifications, excellent understanding of logistics and supply chain process, import/export knowledge as well as ability to work in a time critical environment and having a keen focus on details of process. Finally, the last type of skills mentioned are intellectual ones (7%) including problem solving, relating theory to practise, and handling numerical data.

The highest requirements are set for jobs with a salary of £40-100k annually. These roles include head of transport – development, sourcing specialist – professional services, category manager, procurement director or strategic procurement officer, etc. Within this salary bracket, applicants must have a minimum experience of 5-10 years, varying on position and salary. Most common requirements include a proven track record of significant delivery in global procurement, broad business acumen, forming win-win partnerships or financial analysis skills. Being successful in this job market, the candidate must demonstrate an ability to innovate, reduce costs, and accurately estimate current and new products.

The examined advertisements provide a broad understanding of the knowledge and skills required by successful candidates at these highest salary levels. Experience plays a significant role and it covers 39% including skills and knowledge as negotiation, transport management systems (TMS) and transport planning, experience in telematics or similar logistics system, etc. Subject knowledge (24%) encompasses in-depth knowledge of logistics sourcing including warehouse operations, Kaizen focus on lean manufacturing or strategic procurement knowledge. General Management skills occupy third position by taking into consideration excellent organisational skills, internal / external stakeholder engagement skills

and certainly leadership. The final three categories are intellectual (9%), formal/professional (7%) and practical/transferable (6%).

4.3 Comparison of education provisions and job requirements

Table 3 compares the undergraduate programmes with the requirements or selection criteria from job advertisements under the three salary brackets. The professional and intellectual skills provided by UK higher education institutions appear to be inadequate for jobs at the beginner/intermediate levels (£18-30k and £30-40k). At the higher salary bracket (>£40k) professional and intellectual skills are considered 'a given' and therefore not really mentioned in the job advertisement.

Insert Table 3 here

Table 3 further demonstrates that the job market needs graduates with more general business and management knowledge and leadership skills, over the LSCM subject knowledge. Most UK HE institutions appear to have responded with the 'right' levels of business and management knowledge and leadership skills, especially to the jobs at the beginner/intermediate levels (£18-30k and £30-40k). Again, at the higher salary bracket (>£40k) general business and management knowledge are considered 'a given' and therefore not really mentioned in the job advertisements.

Our examination of job advertisements has not revealed a high demand for finance, accounting and economics knowledge. The LSCM job markets appear to view these subjects as professional knowledge for other professions. Some job advertisements for more senior positions do mention the ability to manage costs but no further high-level skills in these subjects is required. This is a reality check for the institutions that include significant credits for finance, accounting, and economics subjects and believe that these subjects helps prepare their students to the LSCM job markets (see Figure 1, institutions 16-19).

Surprisingly, in terms of LSCM subject knowledge, the UK higher education institutions we studied have perhaps provided (42%) a lot more than the job markets' expectation. As it follows, 18% of LSCM subject knowledge is needed for the £18-30k, 11% for the £30-40k

and 24% for the >£40k salary brackets. According to the job requirements we can see even though LSCM subject knowledge does play a role, other subject knowledge such as business, management and leadership are also required. Comparing this finding with the results presented in Figure 1, the study programmes provided by some institutions (for example institutions 1, 3-7 and 9) appear to have provided study programmes which match with the job requirements in Table 3 and put an equal emphasis in professional skills, intellectual skills, general business, management, and leadership skills over LSCM subject knowledge.

Table 3 also shows that it appears a common practice in the job markets to assume that a candidate is better off gaining knowledge and skills in LSCM via real-life job experience, instead of relying on the theories learned from the HE study programmes. This assumption could be challenged but it is supported by the need for more work experience instead of LSCM subject knowledge in all salary brackets, which is clearly demonstrated in Table 3 and our qualitative analysis. Even at the entry level salary of £18-30k there is a need for work experience. This means that fresh LSCM graduates in the UK are competing with other candidates with work experience (with or without higher education qualification) for jobs after graduation. Qualification alone appears to be inadequate to compete in the job market at the entry level. More significantly, work experience becomes a much the most important criterion for more senior jobs.

5. Discussion and Implications

The findings of this paper demonstrates the value of our novel approach in analysing job advertisements from different salary brackets and comparing them with study programmes provided by UK HE institutions. The paper contributes to the debates about the needs for generalists over specialist (Baruth et al., 2005) in the LSCM job markets (Sodhi et al., 2008). Our findings clearly demonstrate that the job markets prefer graduates with a ‘balanced’ portfolio of professional skills, intellectual skills, general business and management knowledge, and LSCM knowledge. While the over-supply of process-oriented topics such as forecasting, procurement and supplier management in MBA classes has been identified (Sodhi et al., 2008), this paper further reveals the same problem for UK undergraduate LSCM programmes. Our findings suggest that, even though jobs at an entry level salary of £18-30k tend to focus on analysis, control and coordination roles graduates are expected to manage other staff.

Our findings clearly support the argument for the need for graduates who could become 'good managers first and foremost and logisticians second' especially when they become senior logistics executives (Murphy and Poist, 1991). This means many of the institutions which over-emphasised LSCM subject knowledge could end up producing LSCM specialists but not LSCM managers. Having said that, our findings also reveal that senior position applicants are expected to have deeper LSCM subject knowledge than applicants for entry levels LSCM positions. While management skills were recognised as more important than LSCM knowledge for senior LSCM managers in the 1990s (Murphy and Poist, 1991), our findings reveal some changes in the job markets – knowledge and work experience in LSCM has now become a very important requirement for top LSCM jobs.

In terms of the 'right balance' of knowledge of skills, our findings indicate that graduates seeking jobs at entry and intermediate levels need to have more knowledge in general business and management over LSCM subject knowledge. Less than half of the programmes we investigated provided such a balance. Further, specialised knowledge in finance, accounting, and economics are not required. Instead, more emphasis is placed on professional skills such as verbal communication skills, interpersonal skills, presentation skills, supervision skills, organising skills. Basically graduates have to have the ability to manage, regardless of function or specialism. These findings not only support the studies of LSCM job markets (Gammelgaard and Larson, 2001; Murphy and Poist, 1991), they also help to clarify the misconception of the need for problem-solving skills (Tanyel et al., 1999; Gammelgaard and Larson, 2001). While the job advertisements mention problem solving as an important skill set, the emphasis is not on the analytical skills but the communication, team working and leadership skills which are more important in solving complex problems facing multiple functions and organisations in a supply chain. Traditionally courses focus on the ability to analytically solve problems individually, e.g. through traditional assessment methods such as examinations, will not produce the graduates required in the job markets.

This paper contributes to the design of LSCM curriculum by investigating both the supply (through the curriculum) and demand (through job adverts) for LSCM graduates. This approach has provided detailed insights into the knowledge and skills requirements for jobs at three salary brackets (£18-30k, £30-40k, and >£40k). While some basic level of LSCM subject is required at the entry level our findings reveal that more

advanced knowledge is expected for more senior positions. Further, some undergraduate study programmes provided by UK HE institutions are found to have over-emphasised the technical knowledge in LSCM; our findings suggest the need for more general business and management skills, and professional skills as graduates are expected to be able to manage without too much specialisation in LSCM.

Additional knowledge and skills in LSCM subject areas can be acquired through post-graduate study programmes, executive education programmes, or continuous professional development (CPD) programmes designed for candidates with some work experience, in order to prepare them to jobs at above £30k level. This does not mean HE institutions have to reduce the number of credits allocated to LSCM subjects, but that LSCM courses can be redesigned to include greater emphasis on professional, communication and interpersonal skills required in the industry. This also means the traditionally assessment methods focusing on analytical and writing skills have to be reviewed. Due to the emphasis of work experience for jobs at all levels (entry up to senior positions) HE institutions have to put more emphasis on courses which provide professional work experience. Presently, most UK HE institutions provide a professional or work placement as an additional year of study. Even though most institutions ask for a modest fee for this additional year and most companies pay the student for the work placement, there is still a lack of uptake. Potential solutions include making them mandatory, more rigorous promotion of these schemes, or the introduction of more flexible schemes can be implemented.

6. Conclusion and Future Research

This paper contributes to the debate about curriculum design for logistic and supply chain management (LSCM) undergraduate study programmes. It reveals that jobs at different brackets of salaries require candidates with different levels of skills and knowledge. This study finds that only some of the investigated LSCM study programmes matched with the 'balanced' levels of LSCM subject knowledge, general business and management knowledge and leadership skills required by the job markets. Some UK HE institutions have actually over-emphasised the technical and analytical skills for LSCM, and ignored the importance of general managerial skills. The paper also highlights the importance of professional skills.

It should be noted that the findings of this paper have to be interpreted carefully. Findings based on counting of the words associated with different categories of knowledge and skills could potentially lead to misinterpretation of the ranking or importance of certain criteria. While our findings from the job advertisements suggest a need for a much lower percentages (11%-24%) of LSCM subject knowledge, another similar study though for MBA graduates (Sodhi et al., 2008) suggested a much higher percentage (57%). However,thisstudyfocused on undergraduate courses rather than specialist masters e.g. MSc LSCM or generalist MBA programmes.Weachievedourgoalofinvestigatingsupplyversusdemandasameansof examiningthematchesandmismatchesbetweenhighereducationoutputsandtheneedsof employers. Further studies, perhaps based on interviews or survey of recruitment or LSCM managers, using different ranking techniques, will further crystallise our knowledge on this aspect and overcome the limitation of content analysis. Given the limitation of the chosen methodology and the fact that this research focuses on the balances between different knowledge and skills, it is not possible for this paper to examine the detailed course contents and job requirements to reveal the right LSCM knowledge in depth. We thus suggest future researchtointerviewemployersandalumnitoidentifytheknowledgeandskillslacking amonguniversitygraduatesaswellasthetypesofknowledgeandskillsalumnirealisedthey shouldhaveacquiredduringtheirstudies. Further research examining such details (e.g. Alvarstein and Johansen, 2001; Chikan, 2001; Sodhi et al., 2008) as well as the question of the need for integration between LSCM knowledge with production, marketing and other disciplines (Closs and Stank, 1999) will help to further refine the LSCM syllabus.

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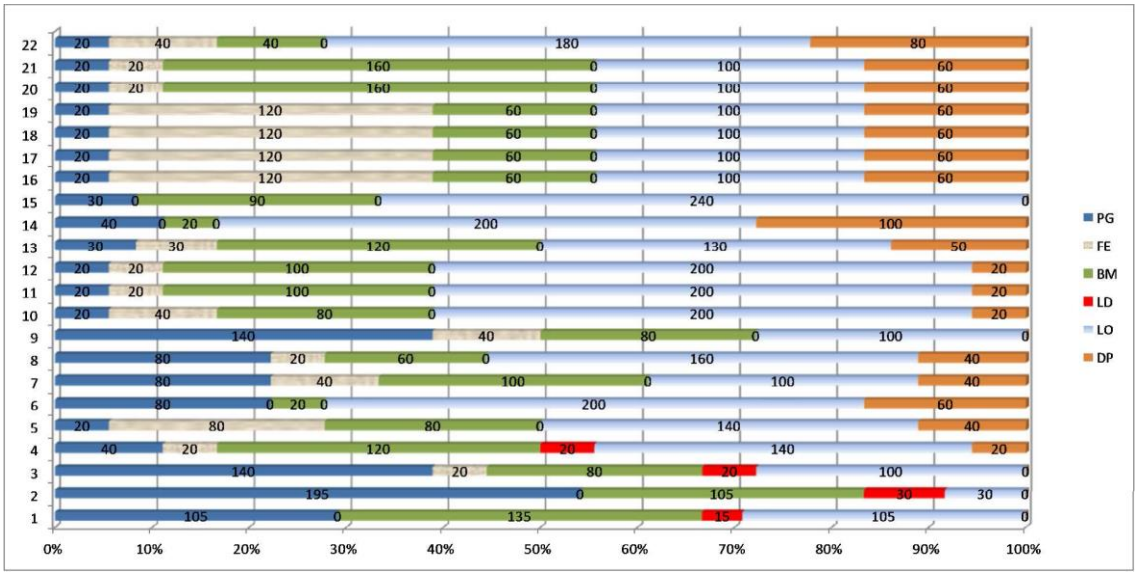

Figure 1 – Programme structure and credit allocation

Source: Websites of the selected courses

Legend (see table 2 for detail): PG – professional skills, FE – finance and accounting, BM – Business and management, LD – leadership skills, LO – logistics subjects, DP – dissertation project; total credits = 360.

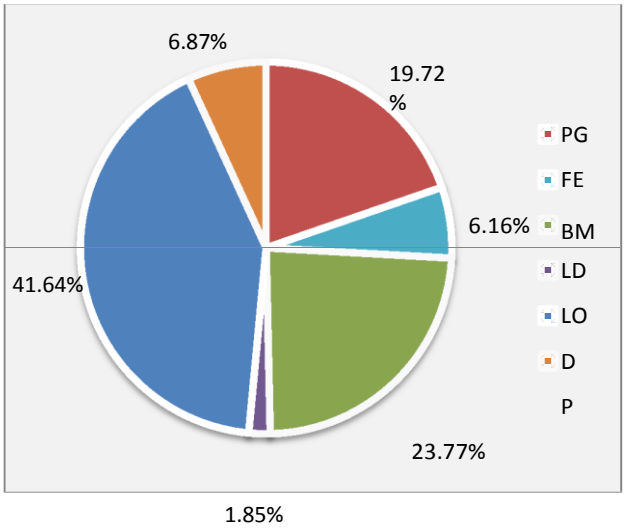

Figure 2 – Average credit allocation for all programmes

Legend (see table 2 for detail): PG – professional skills, FE – finance and accounting, BM – Business and management, LD – leadership skills, LO – logistics subjects, DP – dissertation project; total credits = 360.

Universities / Higher Institutions	Number of LSCM	Qualification	Fees(£)
Aston University	1	3FT/4SW Hon BSc	9,000
Cardiff University	1	3FT Hon BSc	9,000
Coventry University	1	3FT/4SW Hon BSc	8,300
University of East London	1	3FT Hon BSc	9,000
University of Greenwich	4	3FT Hon BA, 2FT Fdg FdA	8,300
University of Glamorgan	2	3FT Hon BA	9,000
Grimsby Institute Education	2	2FT Fdg FdSc, 1FT Hon BSc	5,950
Canterbury Christ Church	2	3FT Hon BSc , 2FT Dip	8,500
University of Hull	23	3FT Hon BSc/BA, 4FT Hon	9,000
University of Hudd[illegible]sfield	5	3FT/4SW Hon BSc, 1FT Hon	7,950
Liverpool John Moores	1	3FT/4SW Hon BSc	9,000
London Metropolitan [illegible]ersity	1	3FT Hon BA	7,100
Myerscough College	2	2FT Fdg FdSc, 1FT Hon BSc	7,500
University of Northampto[illegible]	1	1FT Hon BSc	8,500
Northumbria University	[illegible]	3FT Hon BA, 1FT Hon BA	8,500
University of Portsmouth	[illegible]	1FT Hon BSc/BA	8,500
Plymouth University	[illegible]	1FT Hon BSc, 3FT Hon BSc	9,000
Swansea Metropolitan	4	3FT Hon BSc, 2FT HND	8,500

Table 1 – Undergraduate and pre-degree courses offered by 16 UK HE institutions (Source – UCAS, 2012)

Category	Detail description of knowledge and skill
Professional and general skills (PG)	Professional skills, personal development, study skills, research skills, business communication, project management, decision making, etc.
Finance and economics (FE)	Finance, economic, accounting
Business and management (BM)	General management, introduction to management, human resource management, organisational behaviour, strategic management
Leadership skills (LD)	Leadership skills
Logistics, operations and supply chain (LO)	Logistics, operations and supply chain management
Dissertation and research project (DP)	Research skills, independent learning, project management, time management, critical thinking, academic writing skills

Table 2 – Categories of knowledge and skills

Knowledge and skills	Average of 22 LSCM courses	Requirements from job advertisements		
		18-30k	30-40k	>40k
Professional and intellectual skills	19.7%	32%	23%	15%
General business, management, and leadership	25.6%	22%	25%	15%
Subject knowledge (LSCM)	41.6%	18%	11%	24%
Finance, accounting, economics	6.2%	N.C.	N.C.	N.C.
Work experience	N.C.	18%	27%	39%
Qualification	N.C.	11%	14%	7%

Table 3 – Comparison of job requirements and education provisions

Legend: N.C. Not being classified or considered.