

What is the right supply chain program for your students? Insights from alumni

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Abstract

Every university want to release employable graduates into the job market. Yet, very little is known about how a program needs to be designed to increase the employability of supply chain graduates. This research aims to unravel the underlying mechanisms that link elements of a master program to students' employability. Thirty-one interviews with alumni with over 2 years work experience were conducted, inductively coded and analysed. Findings reveal that three mechanisms are important for enhancing employability of graduates: managing yourself, realism and creating independencies. These mechanisms can be linked to design elements of courses and assessment methods. As such, this paper is one of the first studies to explore how very concrete elements of master programs such as group work, setting deadlines, bringing practice into classes and assignments enhance students' communication, problem solving, analytical thinking and project management skills. Accordingly, this study complements insights related to learning methods such as active learning through showing which program elements enhance essential skills of graduates.

Keywords: Employability, Alumni, Skills, Knowledge

Introduction

Every university program strives to release employable graduates into the job market. However, while university qualifications and professional, discipline-specific knowledge were once considered a guarantee of employment today hiring organization also base their decisions on the competences a graduate has obtained (Clarke, 2008). As a matter of fact, for some employers, the possession of competences such as diverse communication, project management or problem solving skills, are at least equal or even more important than mastery of discipline-specific knowledge (Archer and Davison, 2008). Hence, employability results from the cumulative learning process of a program, possibly further strengthened by wider contextual learning through e.g. internships or extracurricular activities, to build up required skills (Rae, 2007). This suggest that a systems approach (program view) rather than an individual element (course) perspective is required to enable employability of graduates. Accordingly, employability is an outcome of the way a program is structured via design (courses, programs, schedules, class size) as well as teaching and assessment methods (transformation process) enabled by various resources needed to run a program e.g. money, facilities, student and faculty characteristics and support services (inputs) (Mizikaci, 2006). Yet, current operations and

supply chain literature focuses either on individual elements of the system such as courses (e.g. Piercy et al., 2012) or single parts of the input-output transformation process such as attained skills (e.g. Jordan and Bak, 2016). We therefore set out to explore *how different program elements (curricular, teaching and assessment methods) contribute to a supply chain student's employability*.

We draw on qualitative data collected from alumni as graduates students can be used to effectively evaluate and enhance programs with the aim of increasing employability of students (Johnson et al., 2014). As such, this study makes three core contributions. Firstly, this is one of the first studies that uses a systems approach to explore how operations and supply chain management program elements relate to the employability of graduates. In particular, we are able to link elements of the transformation process to specific learning outcomes in terms of employability relevant to industry. This extends current knowledge on teaching literature as we are able to provide fine grained details into what aspects of the learning transformation process are valuable and lead to which results. Secondly, following the call from Gravier and Farris (2008) for studies that assess alumni career preparedness after graduation we extend insights from previous alumni research. Although there are several alumni studies (e.g., Johnson et al., 2014), research tends to be based on survey data. The qualitative exploratory nature of the data collected for this study allows us to reveal insights that might have been missed by a more theory testing approach. Thirdly, and maybe most importantly, the results of this study give insights for higher education institutes and its educators in terms of what to focus on when designing a program

Theory

Learning programs and employability

A graduate is employable if he/ she has generic and discipline-specific skills that are required for performance in work situations (Bridgstock, 2009). Accordingly, university programs are expected to represent accurate, relevant and up-to-date insights of the subject matter knowledge (Huizinga et al., 2014). Reviews of curricular show that in the area of SCM the most common topics covered in courses are inventory management, transportation management, warehousing, logistics, network design, and demand management (Lutz and Birou, 2013; Wu, 2007). At the same time, however, employability relates to more than technical, subject specific knowledge; it determines only 15% of why an individual gets and maintains a job, the other 85% are 'people skills' (Rao, 2014). These are all skills that are necessary at work and are transferable to multiple work situations (Bridgstock, 2009). Accordingly, it has been shown that project management, leadership, communication, strategic planning, problem solving, information management, team working are some of the skills that are important for SCM graduates (Jordan and Bak, 2016). Such skills can be traced back to higher-order learning goals (e.g., linked to analysis or evaluation) found in learning taxonomies from e.g., Bloom (1956) or the Structure of the Observed Learning Outcome (SOLO) Taxonomy by Biggs and Collis (1982). As such, higher order learning links to learning that makes a graduate employable. These higher level learning outcomes should result from the interplay of student's learning efforts, the program and the teaching methods used (Meyers and Nulty, 2009). Ultimately, the curricular (i.e. subjects), teaching methods and the ways students are assessed need to align with the aims of a program (Meyers and Nulty, 2009) i.e. to make students employable. Therefore, we next discuss how the elements of a program, i.e. the teaching and assessment methods, contribute to different learning outcomes and subsequently how these parts interact on a system or program level to make students employable.

Teaching and Learning Approach

There is no single right way to design a teaching or learning approach as courses that make up a program are designed for different purposes to meet the (program) learning objectives (Hamilton and Klebba, 2011). Generally, teaching approaches range on a continuum from teacher-centred (input focus) in which faculty members transmit knowledge to students, to student-centred (outcome-based learning) in which universities produce learning through student discovery (Hoidn, 2016). As such, traditional teaching methods are mostly didactic (Mckimm and Jollie, 2003) such as lectures and seminars in combinations with small exercises (Race, 2011) focusing on explaining, packaging, clarifying and extending knowledge (Piercy et al., 2012). To enhance business environment relevancy, lectures can also be provided by companies in form of guest lectures (Van Hoek et al., 2011). While traditional teacher-centred teaching methods are efficient in delivering factual knowledge to students they are limited in supporting students to gain knowledge that they can transform and apply in other situation (Piercy et al., 2012) i.e. higher order learning, going beyond memorizing, storing and retrieval of information (Van Hoek et al., 2011). This is due to lecturing itself doing little to challenge or question the students' understanding (Biggs, 1996). As such, to achieve qualitative, higher order learning, teaching should be aimed at changing the ways students perceive and use knowledge (Carnell, 2007) and give students more responsibility (autonomy, choice, control) for their own learning (Anthony, 1996; Prince and Felder, 2006). Opposed to traditional teaching methods, experiential and active learning methods involve students in the learning process (Bonwell and Sutherland, 1996). Therefore, experiential learning represents a practical means to develop the cognitive processes that underlie critical thinking (Hamilton and Klebba, 2011) via e.g., case studies, collaborative learning, business simulations games or project based learning (Scholten and Dubois, 2017). Business simulation games such as the beer game, the dice game or the Fresh Connection, for example, require students to engage in different aspects of a supply chain management, generating knowledge by experiencing different theoretical concept first hand (Feinstein et al., 2002). Accordingly, it has been found that experiential methods may help to develop higher order skills beyond technical knowledge (Piercy et al., 2012). At the same time, however, experiential teaching methods are less efficient in transferring large amounts of information, are time intensive for the student and educator and require a specific personality/ mind set from the educator (Scholten and Dubois, 2017). Therefore, in the end most courses use both types of teaching methods, because both traditional and experiential methods reinforce each other (Hamilton & Klebba, 2011).

Assessment

Assessment is an integral component of a program (Wakeford, 2003), yet there is relatively little research about the subject matter (Norton, 2009). While teaching methods allow students to learn, it is upon assessment to give a judgement on that learning (measurement and feedback). Considering to make a student employable, assessments should check a student's understanding of course and how it applies to the real world situation (Zsidisin et al., 2013). This puts an emphasize on formative, curriculum integrated assessment for learning rather than a summative testing what has been learned that drives teaching (Norton, 2009). A large variety of different assessment methods exist such as e.g., written exams with multiple choice questions or long as well as short essay questions, oral examinations (e.g., a presentation) or written assignments that can be individual or on a group level. Ultimately, the assessment activities must match with the intended learning objectives i.e. be valid (Hamilton & Klebba, 2011) as well as reliable (consistent in its application) and fair (Wakeford, 2003).

Program as system that enables employability

Supply chain management related courses and hence the overall program are seemingly well-suited for more applied and active methods of teaching given the dominance of empirically derived concepts and operations-related decision making (Brandon-Jones et al., 2012). Accordingly, the learning system needs to be manipulated in a way that it requires students to adopt a deep learning approach so that employability needs in terms of technical knowledge, but also skills can be met. Yet, it has been shown, that supply chain management course learning outcomes often do not focus on skills that are required to make a graduate employable (Lutz and Birou, 2013). Hence, the assessment can also not provide feedback or judge skills that are important for the employability of a graduate. One of the reasons for the narrow focus could be, that most of the research to date has taken a piecemeal approach looking at individual aspects such as curricular (subjects) (e.g., Lutz and Birou, 2013), assessment methods or specific aspects of teaching methods such as guest lectures (Van Hoek et al., 2011), an individual course (e.g., Scholten and Dubois, 2017) or required skills with no link to the learning environment (e.g., Jordan and Bak, 2016). As such, these studies have not focused on the overall concept of employability that requires cumulative learning over the entire program. Accordingly, Mizikaci (2006) proposes that to think of programs in terms of inputs (money, facilities, staff etc.), processes (curricular, teaching and learning method, assessment), outputs (number of students) and outcomes (employability). Accordingly, we investigate how different program elements contribute to the employability of SCM graduates.

Methods

To be able to design programs in a way that they produce the right range, depth and balance of graduates' competences it is imperative that educational establishments and industry (professional organization and alumni) work together. In particular alumni are important for the assessment, evaluation and continuous improvement of academic programs (Ingram et al., 2005) as they can comment on how their education and academic experiences were relevant to their career and overall employability. They have successfully completed the master program and they can comment on their learning experience from an employee perspective and how relevant their education was to their career (Bridgstock, 2009; Ingram et al., 2005; Moore and Kuol, 2007). Therefore, we conducted exploratory interviews with the alumni of two MSc programs at the University of Groningen: Supply Chain Management and Technology and Operations Management. The faculty to which the program belongs is EQUIS and AACSB accredited. Only 1% of the world's business schools have this combination of accreditation. Furthermore, the SCM master in Groningen is (one of) the best programs in The Netherlands (Keuzegids Hoger Onderwijs, 2016; Elsevier, 2016). Therefore, the two programs are believed to be among the best to prepare alumni for work in all kinds of different industries. These master studies are both one-year programs. The aims of both Master degrees are broken down into subjects specific knowledge, academic skills, social and communication skills as well as study skills and professional orientation, which are further detailed in program and course dossiers. Both studies have four or five core (compulsory) courses and four or three elective courses. Besides that, a master's thesis has to be written.

We focused on graduates of the years 2013-2015 assuming on the one hand that they would still be able to recall specific aspects of their program, while, on the other hand, having at least one year of work experience. In selecting specific alumni out of the cohort of graduates a database was established to capture the evolution of employment, as well as the industry type, company size, work position and job function for each person. Based upon this information, the

ratio of male/ female and graduates per year we sought out graduates with a variety across these variables contacting overall 30 alumni per program (n=60) of which 33 responded positively to our request for an interview. An interview protocol was developed based on existing literature linked to the main constructs under scrutiny. Questions were asked in relation to knowledge and skills required and particularly useful to an alumni's current job, relevance of courses, things that stand out from courses and the overall learning experience. Additionally, we asked each interviewee to complete a short survey which allowed us to measure their perceived achievement of program learning goals based on a five point Likert scale, their perceived most valuable subject areas as well as skills.

All interviews were conducted with two researchers, recorded and transcribed verbatim. Alumni were given the chance to review the transcripts to make alterations or add detail to the information provided. Data was analysed following the three steps suggested by Miles and Huberman (1994): data reduction, data display and conclusion. First the data was reduced to quotes, sentences and paragraphs that were relevant for each skill category (first-order codes).

Discussion of findings

We found several mechanisms on a program level that show how different program elements contribute to the employability of SCM graduates. Similar to previous research (e.g., Bridgstock, 2009; Jordan and Bak, 2016; Rao, 2014) we found that alumni particularly highlighted skills rather than specific technical knowledge to be important for their employment. 'A way of supply chain thinking' and analyzing problems was what alumni valued in obtaining the degree and found useful for the first employments. Accordingly, our identified mechanisms could often not be attributed to specific courses or learning and assessment methods. In particular, we traced that realism, creating dependencies and managing yourself helped to enhance the employability of SCM graduates.

Realism and percipience

We found that establishing realism and percipience (partly due to repetitiveness) helped to increase aspects of employability of graduates. According to the alumni via application, purpose, and diversity in teaching and assessment methods they were able to develop employability skills.

In relation to application we found that both teaching and assessment can create realism illustrating claims by Brandon Jones et al. (2012) that particularly supply chain management related courses are seemingly well-suited for more applied and active methods of teaching. In relation to application we found that a lecture who "*would use students to get up in front of the class and demonstrate with people what it would look like*" made it "[...] *really easy to understand what all these theories were about*". Also role-play and games helped in creating a realistic relationship with for instance customers and improving communication: "*You had a limited three emails where you could ask questions or something. That could happen in a business scenario where you need information from someone who is quite a lot higher up and you cannot keep sending questions*". In addition to this we found that role-play was considered more effective and realistic when multiple contact moments were involved over a longer period of time. Also the use of a business simulation game helped to highlight "*the importance of collaboration between people within a company. [...]. You get to see how it impacts a company [...]. I also told people here at the company I work now that maybe they should do the game once*". Similarly, an assignments using a very concrete example of an operations and supply chain system made it "*really easy and practical to see what's happening*". Additionally, we

found that such application of theory did not need to be very complex to create a sense of realism for students: *“Although it was a very basic level [assignment], it’s these kinds of things [problem] that are very real life, I mean; it could be in any company”*. As such, it shows that the application of theory to real life problems or demonstrations helps to increase the understanding of students while being able to transfer it to other situation creating higher order learning.

Furthermore, we found, in line with Van Hoek et al. (2011) and Scholten and Dubois (2017) that insights from industry via guest lectures, projects and assignments help students to understand how theory works in practice while moving from lower level to higher order learning. *“I think the combination of the theory and the guest lectures, because the guest lectures is just one case. It’s good to know, and it helps to understand the theory as well. And when you know how they apply theory to practice, you can also apply it to other cases”*. At the same time, however, we also found that such insights require a clear purpose to enhance percipience: alumni only recalled these guest lectures, projects and assignment where they had to do more than listen such as using insights from the lecture for their assignment, provide recommendations for improvements etc. One alumnus mentioned that because she had to present to a real company in a course, she felt it was very different from presenting only to peers: *“You had to present it to the business manager I think, that is different from presenting it to the peers.”* Also assessments could help with developing employability skills if preparation for the assessment had a clear purpose. As such, we traced that realism could be created in the skills required to execute a task. It was found that the preparation for an open book exam is comparable to the preparations needed for a meeting: *“you could take the papers with you. It can teach you to select the right information right, because you’ve got a stack of papers this big, covered in highlighting marks, and if you highlighted everything you are screwed because you can’t find anything and if you highlighted nothing then you read the whole paper during the exam. You could compare that to taking information into meetings and stuff, if you prepare properly the meeting is quick and efficient”*.

In relation to realism created through diversity we found similarly to Grabinger and Dunlap (1995) that students learn from each other as much as they learn from the educator. In particular, we found that group work with students from other business related master programs or from other nationalities created a realistic setting that was appreciated later on: *“sometimes it’s a little difficult because with this course it was also people coming in from marketing who had zero experience or knowledge of supply chains. Which is good because you have to work with them”*. This shows, that it is important for program directors to consider the combination of compulsory and elective courses in designing a program so that students have the chance not only to get in touch with but also have to cooperate with students from other programs. Additionally, we also found that it was important for alumni to work with people with different nationalities: *“I had to do some assignments with some people from Asia and they are really different in their way of teamwork. Cross-functional awareness and team work have been highlighted by previous studies as important skills for the supply chain manager of the future (Jordan and Bak, 2016). At the same time, however, alumni also noticed that more diversity could improve the program: “Cooperation with people of different educational levels would be very beneficial, because when you start working all of a sudden there are a lot of people who work 25 years at a single job and think very different. And to communicate with them and to interact with them [...] it is a soft skill which is not taught, [...] I think, it’s very good to know a few things about that.”*

Creating dependencies

We also found that creating dependencies for students in terms of task division and time pressure enhanced the employability of graduates, in particular in relation to communication and project management skills. *“Because of teamwork you have to communicate, make expectations, do time management”* or that there was *“no time to control everything ... I learned to trust, listen and plan.* “ The management of dependencies is also mentioned by this alumnus as important: *“We had to write a report on it, which was a group effort. Everyone did a little bit their own area that they were comfortable with [...] I think that is also part of project management skills, that's part of life, if you want to succeed together, then other people do what they do best, [...] you can look at it on different ways, but in the end, it is how you do a project in real-life as well I guess.”*. While we found that dependencies based on group work increased personal skills, it was often at the expense of technical skills. *“Everyone did a little bit their own area that they were comfortable with, which is the pitfalls of a project of course, because there were some things that I found difficult: I did not touch them. It was someone else who did that”*.

Managing yourself

We found that elements of the whole set of learning and assessment methods invited to know and manage yourself, important aspects of employability that are transferrable to different work situations and positions. Alumni referred to very concrete examples such as setting deadlines for assignments, prioritizing, being concrete and making use of feedback/ reflecting on issues. Students expressed in many ways that these elements helped them in learning to manage themselves: *‘Big changes needed to be made at the latest moment for the thesis and hard work and good time management was required’*. And: *“The program had a very high workload, so I needed to prioritize things”*. Other alumni confirm this: *“I made a deal with my supervisor, [...] every first day I would deliver some part and then of course I did not have it ready on Wednesday, so I worked all night and on Thursday I delivered. [...] I think you learn how to plan your own project.”* Also limitations in writing are mentioned to improve communications skills: *“I remember that one of the things I struggled with was with the word count [...] and I think that is important to learn that you cannot use 3000 words for a report because the people you write reports for during your job do not want to read many words.”* Additionally, feedback can stimulate a student to reflect on work in progress and critically think about how improvements can be made. As one alumnus said: *“The[thesis] supervisor supported me a lot and I could ask him questions and then he gave me options, like you can do this or this or this, but he did not say what I should do, but just like: what do you think? And then I made something and then he said: oh, I like it or I do not like it. You learn a lot about thinking for yourself. [...] Be critical to yourself and ask yourself the right questions.”*.

Conclusions

This paper set out to explore how elements of a master program enable supply chain students' employability. While past research mainly drew on data from students to evaluate different teaching methods or courses (e.g., Piercy et al., 2012; Scholten and Dubois, 2017), alumni are in a better position to judge the usefulness of a course and other program elements. Alumni know what technical and personal skills are relevant to the work place and how the studied program in terms of the curriculum, teaching and learning as well as assessment methods contributed to these skills. As such, by drawing on qualitative data collected from alumni our

findings present unique insights for supply chain management program development, but also overall program design.

Overall, our findings are in line with previous research that highlight the importance of personal skills over technical skills for employment (Rae, 2007). Accordingly we found that the overall program was the context within which certain skills were developed. At the same time, we were able to identify three specific mechanisms that help to increase the employability of graduates: realism and percipience, creating dependencies as well as managing yourself. These mechanisms link to a set of stimuli a program offers that create purpose, application and diversity in their learning (realism and percipience), require project management, task division and time management (creating dependencies) and enforce students to reflect on their own functioning to adapt their behavior (managing self). While these findings provide an interesting new system perspective on programme design, they also create some challenges for educators. While an instructor needs to teach material which will be useful in the real world, students might not fully appreciate how and what they are taught and could reflect that in their evaluation of the course (Guevara and Stewart, 2011). Therefore, it is important to create transparency for student about some of the initiatives that are implemented to increase their employability. While it might not be what students appreciate in the short-term, such initiatives can help to increase the learning outcomes of a program in the long-term.

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