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WHAT SKILLS ARE NEEDED TO BE A HUMANITARIAN LOGISTICIAN?

ABSTRACT

Skills for logistics are of importance for employment and career development as well as in curriculum development, and prior research has highlighted differences in skill requirements for different logistics functions as well as for different groups of logisticians. However, the continuing incidence of natural disasters and complex emergencies and the concomitant challenges of compromised physical and information infrastructure, large numbers of affected individuals and the requirement to build relationships with diverse stakeholder, has increased the demand for humanitarian logisticians - but there is, as yet, little understanding of which skills are important in this context. This article develops a conceptual framework for skills in the field of humanitarian logistics, and evaluates the framework through a content analysis of job advertisements with a special focus on rapid onset disasters such as the 2010 Haiti earthquake. The content analysis concludes that humanitarian logisticians need a broad spectrum of functional skills (such as procurement, warehouse management and transport management) that must often be held in some depth – for example in the transportation area, the task spans fleet management to vehicle maintenance. In addition, however, humanitarian logisticians need ‘contextual’ skills that reflect their particular field of employment (such as security management and a comprehensive knowledge of donor regulations). It is suggested that such contextual skills are likely to feature in other areas of logistic employment, and that further research to identify these would lead to improvements in training and education programs.

Keywords: *humanitarian logistics, logistic skills, content analysis, Haiti earthquake, job advertisement*

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INTRODUCTION

The skills, attributes and knowledge of logisticians are core themes for logistics management and education alike. Unsurprisingly, therefore, logistics skills have been studied for the purpose of tracking career paths (Dischinger et al., 2006, and the series of Ohio State University surveys, e.g. La Londe et al., 2010, and Cooper et al., 2010), curriculum development (Mangan et al., 2001; Mangan and Christopher, 2005; Carter et al., 2006; Okongwu, 2007), tracking the development of the logistics discipline (Murphy and Poist, 1991

vs. 2007; Gammelgaard and Larson, 2001; Keller and Ozment, 2009), and to distinguish between subgroups of the logistics profession (e.g. warehousing, Murphy and Poist, 1993, and third party logistics, Gibson and Cook, 2001). Much attention has also been paid to differences in skill sets between supply chain managers and logisticians (Gammelgaard and Larson, 2001; van Hoek et al., 2002; Mangan and Christopher, 2005; Dischinger et al., 2006; Rossetti and Dooley 2010). Generally, skills research centers around the notion that “the logistics process is human centric” (Myers et al., 2004, p. 212), and consequently that an investment in skills development should translate into both improved employee and organizational performance.

There are, thus, different reasons for studying logistics skills. Logisticians and prospective logisticians consider job requirements in their career planning as well as further development (Gibson and Cook, 2001); whilst educators and sponsors of company-internal career development programs want to know what to include in logistics training and education (Carter et al., 2006). Meanwhile, managers are interested in recruiting logistics professionals with skills that translate into high employee performance and logistics excellence (cf. Murphy and Poist, 1993; Myers et al., 2004; Keller and Ozment, 2009). Interestingly, future employees often appear to be unaware of the requirements of their job which helps explain why warehouse managers include basic activities such as order picking in their recruitment tests (Murphy and Poist, 1993). Hence, recruitment approaches, from job advertisements to the testing of candidates, need to reflect functional and contextual job requirements.

Contextual job requirements have been studied in relation to different logistics functions such as warehousing vs. traffic management vs. transportation (Forsythe et al., 1990; Murphy and Poist, 1993; Gibson and Cook 2001; Ellinger et al., 2003; Rossetti and Dooley, 2010), and

geographical differences (Gibson and Cook, 2001; Mangan et al., 2001; Sohal and D'Netto, 2004; Okongwu, 2007; Rahman et al., 2009; Hamiot and Merle, 2010) but, as yet, not in terms of different application areas of logistics management. However, logistics skills are needed not only in support of businesses, but also in not for profit areas such as public procurement, health care, military logistics and humanitarian logistics (Larson, 2009; Kovács and Tatham, 2009). The latter area has recently achieved particular interest not just because of media attention to a number of high-profile disasters, but in recognition of the importance of the logistics contribution to the success of a mission. For example, Van Wassenhove (2006) suggests that 80% of humanitarian activities (and costs) relate to logistics, and whilst other estimates may be slightly more conservative, the general thesis that humanitarian logistics (HL) effectiveness contributes to the saving of life remains unchallenged. Contextual differences between humanitarian and business logistics have, however, not been studied even though they could contribute to effective recruitment as well as to the establishment of specialized training and education programs. Those entering the profession of HL may also be interested in the contextual requirements in relation to their skill set in order to help understand their person-organization fit (that Autry and Daugherty, 2003, discuss for warehousing, and Cooper et al., 2010, highlight for female logisticians). The aim of this paper is, therefore, to develop a conceptual framework of skills for humanitarian logistics and to evaluate it using a set of relevant job advertisements (JAs).

Humanitarian supply chains are typically described as needing to be “agile” (Oloruntoba and Gray, 2006) thereby reflecting the need to manage the impact of unforeseen events in the face of significant destruction of the physical and communications infrastructure, the presence of multiple deaths and injuries, and the not infrequent breakdown of the rule of law (Kovács and

Tatham, 2009). The dynamic concept of agility is key to several high-velocity markets (Eisenhardt and Martin, 2000) which place a significant premium on the ability to sense and respond to unfolding events quickly and proficiently (Teece, 2000; 2007; 2010; Barreto, 2010) and include not only the humanitarian context (Christopher and Tatham, 2011), but also military forces (Kovács and Tatham, 2009) and, due to turbulences within the business environment, industry (Gattorna, 2006; Singh, 2009; Christopher and Holweg, 2011). The dynamic capability framework (DCF) (Teece and Pisano, 1994; Teece et al., 1997) has been developed to mitigate such turbulence and uncertainty and is, therefore, highly relevant to this context. But while there is considerable literature on mitigation strategies, such as strategically located inventory and seamless virtual integration (cf. Barreto, 2010), it is only recently that attention also turned to the strategic value of skills for the development and maintenance of dynamic capabilities (cf. Butcher et al., 2011).

This paper is structured as follows. First, the literature on logistics skills is reviewed, followed by a positioning of skills in respect to the dynamic capabilities framework. Next, the framework is presented, which is then evaluated in a content analysis (CA) of HL job advertisements. A discussion of findings follows, before conclusions for both logistics skills research and the associated managerial implications are drawn.

LITERATURE REVIEW

Logistics skills research differentiates between actual skills, attributes, experience, competencies and knowledge areas. For example, Myers et al. (2004) make a distinction between logistics knowledge (acquired through education), work experience and skills (social, decision-making, problem-solving and time-management skills). Similarly, Gammelgaard and

Larson (2001) discuss the differences between context-independent skills, and experience-based and context-dependent competencies arguing that both sets of skills and competencies are needed in logistics and supply chain management. Separations between skill levels are less clear in other studies, and even the ones quoted above do not distinguish skills from competencies in their conclusions. In addition, the results of the Myers et al. (2004) survey only show a positive relationship between logistics skills and employee performance, and not between education or experience and performance. That said, education and experience have been found to be embedded in skills by Ramsay (2001), Coff and Kryscynski (2011), and Molloy et al. (2011). More commonly, skills and knowledge are grouped together into skill sets or skill categories. Thus, Dischinger et al. (2006) offer a list of such skill sets: “functional skills” (i.e. skills that relate to logistics/supply chain functions), “technical (ICT) skills”, “leadership skills”, “global management skills”, and these authors even include “experience and credibility”. By contrast, Gibson and Cook (2001) suggest: “general management skills”, “interpersonal capabilities”, “technical skills” and (logistic) “specific capabilities”.

Overall, there is general agreement on the concept of distinct skill sets, and also that whilst technical logistics knowledge is important, it needs to be complemented by other “softer” (Vereecke et al., 2008) or “emotional” (van Hoek et al., 2002) skills. Other authors prefer three skill sets – thus, Murphy and Poist (1991 and 2007) refer to these as “logistics skills” which combine functional and technical skills; “business skills” which relate to other business functions as well as to psychology and sociology; and “management skills” that relate to planning and organizing, but also include personal attributes; whilst Gammelgaard and Larson (2001) argue for “supply chain management (SCM) core skills”, “quantitative/technical skills”, and “interpersonal/managerial basic skills”. A further combination of these skill

groups has led to Mangan and Christopher's (2005) T-shaped skills profile that emphasizes the difference in breadth vs. depth of knowledge, skills and competencies in the different areas. In other words, logisticians need to have a combination of a depth of logistics skills (or SCM core skills) together with broader competence in a number of other areas.

Murphy and Poist (1991, p.88) tested the relative importance of various skill sets, concluding that "it is important to be a manager first and a logistician second". Follow-up surveys confirm this statement (Gibson and Cook, 2001; Mangan et al., Gregory and Lalwani, 2001), albeit with contextual differences in relation to geographical areas (Sohal and D'Netto, 2004; Okongwu, 2007; Rahman et al., 2009; Walker and Russ, 2010) and diversity issues. The latter stream of literature focuses on gender differences in logistics skills and career patterns (cf. Keller and Ozment, 2009; Cooper et al., 2010), although André (1995) also extends it to race and ethnicity. Further differences are found between students vs. practitioners (Gammelgaard and Larson, 2001), position and firm types (Gibson and Cook, 2001), and between business vs. military vs. humanitarian logistics (Kovács and Tatham, 2010).

Interest in HL skills has been invigorated for reasons of competence development and curriculum development (Thomas and Mizushima, 2005; Swords, 2007; CILT, 2008; Walker and Russ, 2010), whilst the Logistics Cluster added to this through the publication of the Logistics Operational Guide (LOG) (Logistics Cluster 2009). This interest reflects not only a growing professionalization of humanitarian logisticians, but also highlights new gaps in existing logistics curricula for those preparing to enter this profession. The simultaneous shortage of humanitarian logisticians, high workforce rotation (up to 80% each year), and the

challenge of retaining personnel (Overstreet et al., 2011) further contribute to the importance of identifying HL skills.

These studies also suggest new skills relevant to the humanitarian context. For example, Swords (2007) adds pressure tolerance, building and maintaining relations in changing teams, operational decision making in emergency situations; whilst CILT (2008) includes medical logistics, donor compliance, customs clearance, fundraising, base management and inter-agency coordination; and Walker and Russ (2010) discuss security and safety, monitoring and evaluation methods, and a variety of humanitarian activities ranging from needs assessment to specialized knowledge in water and sanitation – but the relevance of these suggestions has yet to be evaluated. However, all these studies agree on the need for specialized training, certification programs, and associated education of humanitarian logisticians.

SKILLS AND CAPABILITIES

Skills and assets form the two important raw components of capabilities in the resource based view (RBV, Barney, 1991; Olavarrieta and Ellinger, 1997; Grant, 2009; Coff and Kryscynski, 2011; Molloy et al., 2011). Both as an input factor and a component of capabilities, the skills of individuals contribute to the resource configuration of the firm and, thus, to the firm's survival (cf. Collis and Montgomery, 1995) as well as reflecting their role as catalysts for increasing the absorptive capacity of a firm and, thereby, allowing it to develop new capabilities (Azadegan et al., 2008). The strategic value of skills as a resource lies both in their heterogeneity and inimitability – in this respect, skills are deemed to be relatively immobile and rigid and therefore are not easily copied or acquired (Azadegan et al., 2008; Hunt and Davis, 2008; Molloy et al., 2011). For example, Ramsay (2001) discusses the heterogeneity of purchasing skills as being a hard to replicate, if not inimitable, source of sustainable

competitive advantage. Identifying specific skills is, thus, important for determining their strategic value as a resource (Collis and Montgomery, 1995).

RBV focuses on the identification of firm-internal resources (including skills) that contribute to sustainable competitive advantage. In this context, perhaps the concept of ‘competitive’ advantage is unfortunate in that, theoretically and ideally, all those preparing for and responding to a disaster should be doing so with the focus firmly on providing assistance to those who have been affected. Nevertheless, there is a considerable degree of competition between humanitarian organizations (Cross, 2011) although at least in part this reflects the mandate or strengths of the organization (for example, some focus on medical responses, others on the provision of water and sanitation). At the same time, there is increasing pressure from the donors (encouraged by the media) for agencies to perform efficiently and effectively. Thus, in that sense, the way in which an agency disposes of its resources to meet this challenge reflect Barney’s (1991) firm-internal view as opposed to environmental models of competitive advantage. However, Collis and Montgomery (1995) argue that RBV combines both internal and external perspectives on the firm. Others (e.g. Conner, 1991; Harrison et al., 2001) extend RBV to the internalization of resources through partnerships and from the firm’s environment. For example, in SCM, skills could be internalized through inter-organizational teams. In HL, the practice of secondments contributes to skills transfers (McLachlin and Larson, 2011; Tomasini, 2011). Even in a simpler form, resources are internalized through purchasing (Hunt and Davis, 2008) which, in the case of skills, refers to recruitment.

Beyond the identification of rare, inimitable and immobile resources and skills lies the question of how to synergize and transform them into capabilities that can contribute to competitiveness in a dynamic, as distinct from static, environment (Olavarrieta and Ellinger,

1997; Eisenhardt and Martin, 2000; Daugherty et al., 2009; Grant, 2009; Fawcett et al., 2011; Paulraj, 2011). Originating from RBV, the dynamic capabilities framework (DCF) introduces a more permeable notion of firm boundaries and capability development. The focus here is shifting from current resource configurations to the development of capabilities that contribute to the firm's competitiveness in a rapidly changing environment (Teece and Pisano, 1994; Fawcett et al., 2011) and the DCF emphasizes different capabilities depending on the firm's context (Barreto, 2010). Barney (2001, and Barney et al., 2011) himself refers to DCF as an evolutionary version of resource-based logic, while Hart and Dowell (2011) even re-incorporate DCF to RBV when further developing the natural resource based view.

The dynamic environment of disaster relief is self-evident. Hence, humanitarian organizations (HOs) have been described as "most agile" (Oloruntoba and Gray, 2006) and "fully flexible" (Gattorna, 2006). When it comes to skills, the practices of secondments (Tomasini, 2011), volunteers (Kovács and Tatham, 2009; McLachlin and Larson, 2011), communities of practice and the so-called cluster approach (when HOs are grouped in thematic clusters, one of which is "logistics") further highlight the semi-permeable nature of HOs. A prime example of secondments is the Myanmar operation of the United Nations Joint Logistics Centre (UNJLC) that drew logisticians from nine different HOs. Analyzing their resource configurations, Kovács and Tatham (2009) come to the conclusion that HOs draw on external resources not only in terms of assets, but also in respect of skills through a process of in-sourcing personnel from e.g. volunteer databases. HOs have embraced what Christopher and Holweg (2011) refer to as "structural flexibility" in their argument for such a business model in turbulent times.

Logistics research has linked skills to various capabilities, for example Ramsay (2001) and Hunt and Davis (2008) single out purchasing as a capability, whilst Autry et al. (2005) and Lai et al. (2008) mention information technology and logistics information systems, Azadegan et al. (2008) focus on manufacturing capability, and Tatham and Houghton (2011) discuss an “emergency response capability”. Logistics itself has been assessed as a dynamic capability (Zhao et al., 2001; Autry et al., 2005; Esper et al., 2007).

Skills and bundles of skills are linked directly to single-task capabilities, which are then aggregated to specialized ones in hierarchies (Grant, 2009). The most basic of capability hierarchies is though the distinction between “zero-level ordinary” capabilities for the short term and “higher-level substantive” capabilities to solve problems and even change ordinary capabilities (Barreto, 2010). Disaggregating “logistics capability”, Olavarrieta and Ellinger (1997) highlight Wal-Mart’s distribution system and Hewlett Packard’s postponement dexterity alongside team work, supplier relationship management, technology, new product development, service delivery and order fulfillment. Zhao et al. (2001) break down logistics capability into customer-focused vs. information-focused elements, to which Esper et al. (2007) add supply-management, integration, measurement and, ultimately, logistics learning. Paulraj (2011) distinguishes between firm-level vs. relational capabilities but argues that they have a joint effect on sustainable competitive advantage. Similarly, Sinkovics and Roath (2004) distinguish between the capabilities of operational flexibility and collaboration. Generally speaking, there is no consensus in literature how “logistics capability” should be disaggregated into specific skills, nor is there any consensus about which skills to place in which skill sets. Alternative levels and conceptualizations of dynamic capabilities depend on

their “nature, specific role, relevant context, heterogeneity assumptions, and purpose”

(Barreto, 2010, p.270), however, there is general agreement in that:

- (1) Skills are important for the development of dynamic capabilities,
- (2) There is an hierarchy of skills and of capabilities, and
- (3) The context of the organization determines which dynamic capabilities are needed.

Furthermore, the logistics literature indicates that logistics as a capability is not alone in setting skills requirements. Rather, logistics uses the “T-shaped” skills profile frequently found in the engineering literature that highlights the need for combining the logistics capability with other management capabilities (see Mangan and Christopher, 2005).

RESEARCH DESIGN AND CONCEPTUALIZATION

In light of the review of relevant literature discussed above, this study was designed to capture the additional skills for logisticians in the humanitarian context over and above those deemed to be important in a business context, as well as to evaluate the relative importance of all of these skills. A variety of methods to capture such data have been used in previous logistics skills literature. Most common are surveys among students, practitioners, and recruiters (Murphy and Poist, 1991, 1993 and 2007; André, 1995; Gammelgaard and Larson, 2001; Mangan et al., 2001; Myers et al., 2004; Cooper et al., 2010; La Londe et al., 2010), although there are also examples of case studies (Gammelgaard and Larson, 2001; Mangan and Christopher, 2005; Dischinger et al., 2006, Carter et al., 2006). A few studies have analyzed job advertisements and employment vacancies (further denoted as JAs) reviewing either the location of the JA and its effectiveness in recruitment (Gibson and Cook, 2001), or its content (Okongwu, 2007; CILT, 2008; Rossetti and Dooley, 2010). JA content analyses have been used in other disciplines to identify gaps between skill requirements on the job vs. those

advertised (Mathews and Redman, 2001), industry trends in job locations, and to determine the skills and attributes sought by employers (Robinson et al., 2010). In contrast to practitioner surveys, JA content analyses take the employer perspective and highlight expected and desired skills that the candidate should be able to demonstrate.

Content analysis (CA) has been used more broadly to detect trends in logistics research including the evolution of logistics thought in general or in relation to certain topics (e.g. modal choice, Cullinane and Toy, 2000; logistics education, Gravier and Farris, 2008; research approaches in logistics, Spens and Kovács, 2006; Craighead et al., 2007) or journals (Miyazaki et al., 1999). Many of these studies use scientific articles as a basis of the analysis. In other words, they apply CA as a technique for a systematic literature review. On the other hand, Ellinger et al. (2003) utilize CA for evaluating websites of motor carriers, while Hamiot and Merle (2010) analyze interview transcripts using this method. Last but not least, both Okongwu (2007) and Rossetti and Dooley (2010) use CA to consider job advertisements.

CA can be used to classify latent as well as explicit content, and to analyze textual data on a qualitative as well as quantitative basis. A prerequisite for a quantitative CA is the use of a robust framework and a preset categorization scheme for coding data. Our framework (see Figure 1) is based on Mangan and Christopher's (2005) T-shaped skills profile as used in the Kovács and Tatham (2010) survey. Additional skills for the humanitarian context were identified in HL literature (Thomas and Mizushima, 2005; Swords, 2007; CILT, 2008; Walker and Russ, 2010) including Tatham et al.'s (2010) study on vacancy notifications. Contextual skills were initially placed in a separate skill set even though, arguably, skills such as "fleet management" and "mechanics and maintenance" could have also been placed within functional logistics skills, "reporting" in interpersonal skills etc. The exception to this

separation was those skills that were clearly related to one another, for example, “budgeting” being included in “finance and accounting”; “recruitment” in “human resource management” etc. Using this framework, the skills were compiled into a classification and, hence, coding scheme for the subsequent CA.

<Please take in Figure 1 about here>

Sampling, coding and analysis

JAs were sampled from ReliefWeb that lists advertisements for humanitarian logisticians from a broad range of organizations. The website is administered by the Office for the Coordination of Humanitarian Affairs (OCHA), and represents the major source of JAs across the whole spectrum of disaster relief and development activities, with over 1,000 such advertisements being added each month. The data set drew on JAs for the period January-March 2010 using the keywords of “logist*” and “supply”, resulting in a total of 180 JAs, of which 21 were in French, 1 in Spanish and the rest in English.

Three independent coders (plus additional language assistance) were used to code the data set following a reductionist approach which dictated a focus on explicit content. Definite, and thus independent and mutually exhaustive, categories for each indicator were set as “R” for “explicitly required as a minimum expectation”, “D” for an “additionally desirable/preferred qualification” or blank for “not mentioned”. The use of a rigid coding scheme and clear categorization rules helped to ensure objectivity and transparency. Validity was increased through the application of a conceptual-theoretical framework (as suggested by Krippendorff, 2004), and through the use of independent and mutually exhaustive coding categories (*ibid.*).

The reliability of the study was assessed through the use of a joint coding instrument, three coders, and the computation of inter-coder reliabilities. These were tested on ten JAs at the start of the process resulting in .77^A which, after removing disagreements between definite and indefinite categories (i.e. between “R” and “D” but not between “R”, “D” and “not mentioned”), rose to .79 – an acceptable level for this type of study.

In line with the DCF hierarchies of skills and capabilities (Grant, 2009; Barreto, 2010), the data revealed clear skills hierarchies (see Figure 2) that were subsequently followed through in nested coding from top to bottom. For example, a skill requirement of information technology management or of logistics information systems led to an automatic ticking of the requirement for information systems (IS) literacy. On the other hand, certain skills that were expected to reflect a hierarchy (e.g. fleet management pertaining to the higher level of transportation management) were consistently mentioned separately, also in HL literature (CILT, 2008). We maintained such separations in the coding.

<Please take in Figure 2 about here>

RESULTS OF THE CONTENT ANALYSIS

An important result of the study was the relative importance of functional logistics skills in HL JAs. Unlike the emphasis of the breadth of general management skills in business logistics (cf. Murphy and Poist, 1991; Gibson and Cook, 2001; Mangan et al., 2001), HL JAs focused on the depth of functional knowledge and ranked skills such as “inventory and asset management”, “purchasing and procurement”, “transportation management” and “fleet management” among the top five (see Table 1). This emphasis on functional logistics skills in

HL is consistent with Kovács and Tatham's (2010) findings from a survey across business, humanitarian and military logisticians. These authors offer several alternative interpretations for this: the definition of logistics varying between cohorts; a traditional view of logistics in the humanitarian context; an actual need for more functional skills in this context; or the humanitarian respondent group tending to offer more extreme response scores on the Likert scale of their survey (*ibid.*).

<Please take in Table 1 about here>

Results relating to the administrative role of humanitarian logisticians and their importance in training others, particularly national staff, confirmed initial findings from the pilot study. Furthermore, the first ranks of skills compare rather well to the CILT (2008) study that ranked "procurement" first, "inventory management" second (here both are ranked equally as 1) and "capacity building/training" third (as in this study). The double importance of fleet management (CILT rank 4) alongside transportation management (CILT rank 5, in our study both *ex aequo* ranked 5) was also confirmed. The importance of procurement in logistics JAs is, however, somewhat counterintuitive as HOs often separate procurement from logistics staff. For example, MSF's organizational structure separates between "supply" and "operational logistics" (MSF, 2011).

In line with the underlying hierarchical approach within the RBV and DCF and the resulting hierarchies of indicators in the coding scheme, final ranks were given for non-nested indicators (skills) only, for example for problem solving but not problem analysis and problem identification and so forth. Full lines in Figure 2 show how indicators were nested and coded

in hierarchies. For example, if “problem solving” was mentioned, the boxes for “problem analysis” and “problem identification” were ticked but lower levels were not ranked. On the other hand, if “problem identification” was mentioned but “problem solving” was not, we only coded the level mentioned and below. Thus, although all mentions of a particular skill were coded and counted, the effect was one of cumulative scores. Notwithstanding the ranks, it is worth noting that for example “information literacy” was required 128 times, and this cannot be explained by hierarchical coding alone as its higher-level hierarchies “information technology management” and “logistics information systems” were required only 25 and 89 times respectively. Such an explicit requirement for a lower-level indicator suggests either that there is a current lack of information literacy among humanitarian logisticians, or that it is an important market entry level requirement for the job.

Dashed arrows in Figure 2 were also identified as nested indicators, but here the structure of the job lead to their separation. For example, “fleet management” could arguably be a subset of “transportation management”, but in practice, humanitarian logisticians use their own transport fleet only in respect of outbound logistics; whereas the management of transportation would reflect both the inbound and outbound activities. What is more, the CILT (2008) study also maintains a separation between transportation management and fleet management. Therefore, such separate indicators were not seen as “nested” in the coding scheme and received their own overall rank.

Apart from the ranking, a factor analysis was performed to further reduce the data, resulting in skills such as “autonomy” (the ability to work independently), “port / airport management”, “legal” and “reverse logistics” to be excluded from the further analysis (and hence, from the

rankings). The removal of “port/airport management” was rather surprising as it was included in the findings of the CILT (2008) study. On the other hand, “reverse logistics” is indeed not a key activity in HL, even though organizations have been criticized for bringing in unsolicited supplies that result in enormous waste problems (Eng-Larsson and Vega 2011). Importantly, several skills loaded on more than one factor; hence we couldn’t develop clear skill sets on the basis of the factor analysis.

Testing for new skills from the humanitarian literature resulted in some surprises. Stress management (Sword’s, 2007, “pressure tolerance”) achieved a very low score (29) in the content analysis, although it may simply be that it is self-evident that the humanitarian context represents a stressful situation and this skill was not, therefore, included in the JAs. Customs clearance (suggested by CILT 2008 and the Logistics Operational Guide of the UN Logistics Cluster) ranked only 21 (out of 33). Less surprisingly, marketing and customer relationship management were amongst the lowest ranks (32 and 31), as beneficiaries have no purchasing power and are not seen as customers (see Kovács and Tatham, 2010), and as relationships with donors replace customer relationships (see CILT, 2008). “Knowledge of donor regulations” was indeed ranked higher (15). In addition, the relatively high occurrence of the requirement for “coordination” (liaison with other organizations, rank 13) skills confirms the importance that HOs place on this aspect of the logistician’s role. Apart from the overall focus on functional logistics skills, the skill to train others appears to be very important in the HL context (rank 3). Training is an important aspect of capacity building and thus, building in-country resilience – after all, disasters are large-scale disruptions that the system (or country) cannot cope with alone (Long and Wood, 1995; UN/ISDR, 2004; van Wassenhove, 2006;

Kovács and Spens, 2009). Building in-country resilience may therefore reduce the future needs for international assistance.

The case of the Haiti earthquake

The data underpinning the study included a significant number of JAs (59 of 180) that were concerned with just one major disaster, namely the Haiti earthquake of January 2010. This allowed a comparison of JAs related to this particular disaster against the remainder. Within the latter (i.e. remainder) category, the JAs related to a large variety of locations with the largest group of jobs being based in the Democratic Republic of Congo (DRC) (28) and the second largest in various areas of Sudan (15), with all other groups consisting of less than ten jobs in the same country. Many of these other jobs were concerned with complex emergencies (DRC, Sudan, Chad, etc.) and with logistics management positions in country offices and regional hubs rather than in the field – though it is not always clear from the JA where a person will be placed. In light of the abundance of literature on disaster taxonomies and their shortcomings (e.g. van Wassenhove, 2006; Kovács and Spens, 2009), it could be expected that the two groups of JAs would differ in their emphasis of skills and skill sets.

The group split revealed some interesting differences: Firstly, Haiti JAs were frequently shorter (one page) compared to the others (three to four pages). They also placed an even stronger emphasis on functional logistics and problem-solving skills than non-Haiti JAs, though an independent sample t-test (see Table 2) only revealed few differences as significant. For example, customs clearance, import and export was suddenly ranked 17th instead of 24th of

33 (with a mean of 0.78 compared to .30 in the rest of the ads, $t=-3.357$ at $p<0.01$). This can be explained by the bottlenecks at the port and airport of Port-au-Prince.

<Please take in Table 2 about here>

Other functional logistics skills such as transportation management, inventory management, and warehousing as well as fleet management (which, arguably, could be placed among functional logistics skills) were also significantly more important in the aftermaths of the Haiti earthquake. Indeed, the top five ranks in the Haiti group were all functional logistics skills (see Table 1). Training somewhat (though not significantly) decreased in ranks, reflecting the importance of first logistical response before capacity building. Skills that were though significantly more emphasized were problem solving, liaising with other agencies, reporting and the ability to work under pressure^B, as is to be expected from a complex emergency, i.e. where a natural disaster strikes in an area of political unrest with war elements or peacekeeping. The significance of liaising with other organizations was the more important as HOs were heavily criticized for a lack of coordination. Yet, there were no significantly higher requirements for security management, even though complex emergencies such as the Haiti earthquake might suggest a stronger focus on security.

Triangulation of results

The results of the CA show how frequently certain skills are required in the humanitarian setting. However, JAs could be seen as mere “wish lists” for skills, and do not necessarily represent the skills that are actually needed on the job. What is more, we could only separate groups for Haiti-related vs. other JAs, but it was generally not clear from the JAs whether a

job was advertised for the headquarter, country management or field level. Therefore we looked into alternative ways to establish actual job requirements, which we did in three ways: We interviewed five humanitarian logisticians about the relative importance of different skills on the job. We also drew on a social media-based discussion (on LinkedIn) on the need for specific skills when operating as a field logistician. Lastly, we discussed the results of the CA in a workshop with 40 humanitarian logisticians and researchers in the field.

The interviews were semi-structured, starting with open-ended questions and then turning to a discussion of the relative need of the 10 highest ranked skills from the CA on various job levels (HQ, country management, field). The following quote illustrates the dynamic nature of the (humanitarian) logistics capability: “[We are] particularly keen to have dynamic staff who are able to think on their feet.” At the same time, there is an emphasis on the special context of HL that is also derived from humanitarian law and organizational culture. Interviewees confirmed the focus on functional logistics skills, but many other identified skills related to the humanitarian context, e.g. training, implementation of logistics policies, the ability to work and take decisions under pressure, and reporting. Reporting to donors is considered crucial, as well as the link to accounting systems but there is still no established link between logistics performance metrics and these reports. As for the division between transportation management and fleet management, an analysis of the interview material showed that HOs often manage their own fleet in a disaster area while outsourcing inbound transportation. This may have led to the simultaneous emphasis on both skills, notwithstanding the existence of a hierarchy between them. That both, and not just one skill, is emphasized, also points to HL being concerned with “integrated logistics” whilst maintaining the inbound-outbound separation as suggested in Rossetti and Dooley’s (2010) analysis of SCM JAs.

Contrary to the CA, interviewees also identified trends, e.g. towards a professionalization of humanitarian logisticians, a stronger focus on technology (though paper-based systems still prevail), more coordination, and a more relationship-building approach to coordination with other HOs. Professionalization is also taken up in the LinkedIn discussion on “How to get into humanitarian logistics...” where a member of the Humanitarian Logistics Association (HLA) group gives the advice to take a certification in HL, volunteer, or to be seconded from a (commercial) logistics service provider to humanitarian operations as alternative strategies to enter the HL profession. The workshop discussion of initial CA results also focused on professionalization and the needs of HL training and education, including the need to train the trainers to facilitate capacity building.

The context is compared to event logistics. This quote sums up the focus beyond functional logistics skills: “Expand your skills and knowledge wider than logs [logisticians], [because] that [can] make you a valuable team member; ideas for this include VHF and HF radio set up and use, IT Satcomms, diesel engine mechanics, water filtration, SPHERE, Camp Management and definitely some sort of security management (particularly dealing with convoys, physical protection).” This confirms the importance of technical skills in the communications technology area as well as the need for security management.

CONCLUSIONS

The aim of this paper was to develop a conceptual framework of skills for humanitarian logistics and to evaluate this through an analysis of relevant job advertisements. The framework that was created drew on the previous literature relating to logistics skills in a

business logistics context, but was amended to reflect insights from HL literature. The resultant framework demonstrated both the overall importance of functional logistics skills, as well as the need to incorporate an additional skill set related to the humanitarian context. Arguably, such context-specific skills could be added to many if not all other fields in which logisticians are employed: e.g. public management, health care, business logistics, military logistics, academia etc. (cf. Kovács and Tatham, 2009). Indeed, it could be argued that the reduced emphasis on general management skills in the humanitarian context is attributable to these being the “contextual skills” of business logistics. Similarly, the lower emphasis on marketing and customer relationship management could be explained by the ambiguity of the question of “who is the customer in humanitarian logistics”.

Conclusions can also be drawn for different interest groups. Future humanitarian logisticians need to consider the importance of contextual knowledge before entering the profession as, indeed, should academics before attempting to conduct research in this field. For example, there is a strong requirement for technical and functional knowledge including, in some cases, aspects of mechanics and maintenance. As a result, humanitarian logisticians may need to engage in manual tasks as well as management aspects of the job and this may, in part, explain the paucity of female humanitarian logisticians reported previously (e.g. Kovács and Tatham 2010). At the same time, humanitarian logisticians routinely manage a number of administrative tasks, and even facilities (such as offices and staff accommodation), in the field. With these additional requirements in mind, educators need to place a stronger emphasis on appropriate training in the technical aspects of the role, in logistics administration and on educating future humanitarian logisticians in how to train others.

Apart from context-specific skills, an important conclusion of our research was the hierarchical nature of skills that contribute to logistics capability and incorporated the idea of skills hierarchies from RBV literature to skills models in logistics. At the same time, it is worth noting that lower-level skills can be important requirements to qualify for a job (e.g. information literacy) and that the organization of the job can impact on requiring skills on various levels in the hierarchy (e.g. fleet management for outbound and transportation management for inbound transportation). Further research is though needed to address skills hierarchies in different contexts before arriving at a robust skills model for logistics overall. Results of the factor analysis (factors that loaded in two or more groups) also indicate a need for further studies to develop clear skill sets. Ambiguities in the attribution of skills to definite skill sets may stem from hierarchies that span over the sets in the Mangan and Christopher (2005) framework but also from a general interrelatedness of skills, for example, whether supply chain collaboration should be seen as part of a relational capability (as in Paulraj, 2011), dynamic capability (as in Fawcett et al., 2011) or overall critical capability (as in McLachlin and Larson, 2011).

Further research is needed to address also some other limitations of this study. First, an analysis of JAs may not provide an accurate overview of the skills actually required on the job; rather, it reflects the view of human resource managers (or those composing the advertisements) of what “logistics” entails. Secondly, CA does not reveal the actual weight of different skills for a particular job but infers their importance from textual representation only. Some of the skills may, in reality, be “nice to have” even if they are labeled as “required”. This implies the need for further research including interviews with logisticians in the field vs. at headquarters vs. HR staff. Our interviews with logisticians are a first step in this direction.

The second major strand of further research is aimed at further testing the accuracy of the JAs by interviewing a number of logisticians who successfully applied for an advertised position. The aim here is to understand the extent to which the specific duties and responsibilities laid out in the JA represent the reality of their subsequent employment. As before, it is anticipated that this will best be undertaken on the basis of the relative importance of specific skills.

Thirdly, further research is needed to address the link between skills and HL performance (Kovács and Tatham, 2010; Tatham and Hughes, 2011). Performance measurement is an important stream of HL research, particularly due to the importance of achieving the appropriate balance between societal implications and aid effectiveness alongside equity requirements and traditional efficiency/effectiveness measures.

Finally, and perhaps most intriguingly of all, the researchers have been struck by the enormity of the challenge faced by the humanitarian logistician who must operate in a highly psychologically and physically stressful environment, earning relatively little financial remuneration and, potentially, being the target of hostile actions. Indeed, according to the Humanitarian Policy Group 260 aid workers were injured, kidnapped or killed in the field during 2008 alone (Stoddard et al., 2009). So, given these challenges and perils, the question is: what motivates the humanitarian logistician? Furthermore, to the extent that those working in this high pressure environment are successful, it may well be the case that their insights will have considerable relevance in an increasingly turbulent business context.

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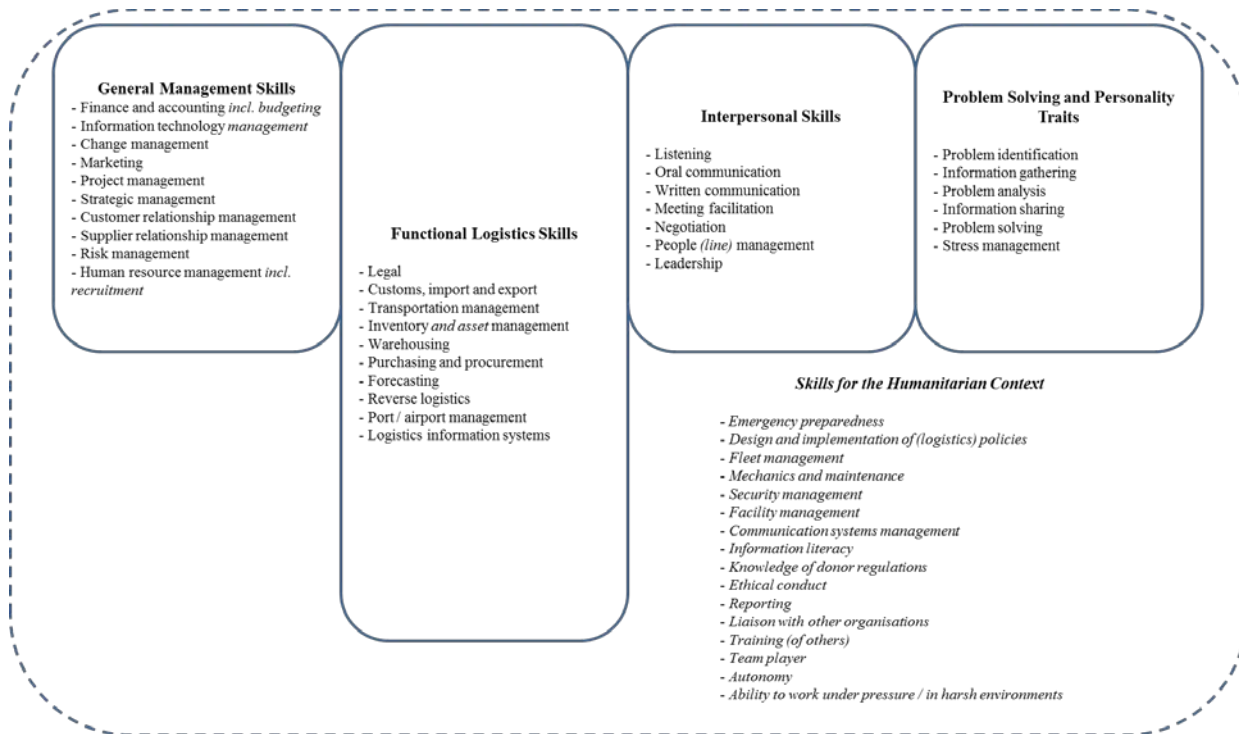
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[A] Reported values are for percentage agreements. There are many other, better tests of intercoder reliability, of which the most recommended ones are Krippendorff's α and Scott's π . However, Scott's π is a measure for two coders (only), and current software can compute

Krippendorff's α for a maximum of 40 indicators (Lombard *et al.* 2008). Yet our model resulted in 49 indicators in spite of a reductionist approach. Thus, our variations of potential pairs exceed software limitations of 90 (as we have 49 indicators, three definite categories and three independent coders). In other words, the data set is too big to be handled by even specialized software, which leaves us with the only computable test of percentage agreements. [B] Except for the ability to work under pressure, there were no significant differences in any of the lower-level skill hierarchies thus they were excluded from Table 2 along with skills that were already excluded through the factor analysis.



*modifications and additions in italics

Figure 1: The skills profile of the humanitarian logistician

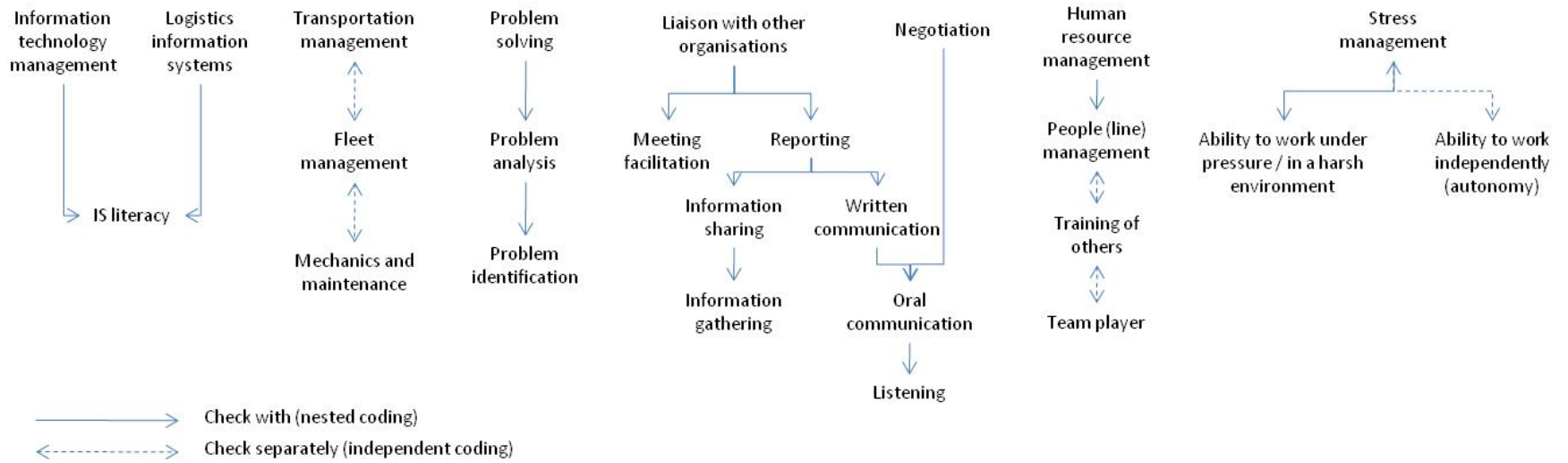


Figure 2: Hierarchies of indicators

Table 1: Skills representation in humanitarian logistics job advertisements

Skills	Haiti group			Non-Haiti group			Content analysis			Final rank ³	
	Total	%	Rank ³	Total	%	Rank ³	Total	%	Rank ²		
General management skills	Finance and accounting <i>incl. budgeting*</i>	32	54%	9	69	57%	4	101	56%	15	7
	Information technology management	5	8%	26	20	17%	22	25	14%	37	25
	Change management	0	0%	32	2	2%	30	2	1%	46	32
	Marketing	0	0%	32	2	2%	30	2	1%	46	32
	Project management	8	14%	25	22	18%	21	30	17%	36	24
	Strategic management	3	5%	28	11	9%	27	14	8%	40	27
	Customer relationship management	1	2%	31	2	2%	30	3	2%	45	31
	Supplier relationship management	16	27%	21	33	27%	19	49	27%	31	19
	Risk management	2	3%	30	2	2%	30	4	2%	44	30
	Human resource management <i>incl. recruitment</i>	25	42%	16	47	39%	14	72	40%	25	15
Interpersonal skills	Listening ¹	52	88%		103	85%		155	86%	2	
	Oral communication ¹	52	88%		104	86%		156	87%	1	
	Written communication ¹	51	86%		102	84%		153	85%	3	
	Meeting facilitation ¹	33	56%		46	38%		79	44%	22	
	Negotiation	16	27%	21	33	27%	19	49	27%	31	19
	People (<i>line</i>) management ¹	44	75%		84	69%		128	71%	8	
	Leadership	27	46%	14	40	33%	17	67	37%	27	17
Problem solving and personality traits	Problem identification ¹	23	39%		30	25%		53	29%	30	
	Information gathering ¹	50	85%		98	81%		148	82%	5	
	Problem analysis ¹	23	39%		31	26%		54	30%	29	
	Information sharing ¹	50	85%		99	82%		149	83%	4	
	Problem solving	21	36%	18	13	11%	26	34	19%	34	22
	Stress management	3	5%	28	3	2%	29	6	3%	42	29
Functional logistics skills	Customs, import and export	23	39%	17	18	15%	24	41	23%	33	21
	Transportation management	44	75%	4	65	54%	5	109	61%	13	5
	Inventory (<i>incl. asset</i>) management	52	88%	1	90	74%	2	142	79%	6	1

	Warehousing	42	71%	5	60	50%	9	102	57%	14	6
	Purchasing and procurement	51	86%	2	91	75%	1	142	79%	6	1
	Forecasting	4	7%	27	7	6%	28	11	6%	41	28
	Logistics information systems	32	54%	9	57	47%	10	89	49%	17	9
Skills for the humanitarian context	<i>Emergency preparedness</i>	12	20%	23	20	17%	22	32	18%	35	23
	<i>Design and implementation of logistics policies</i>	33	56%	7	63	52%	7	96	53%	16	8
	<i>Fleet management</i>	46	78%	3	65	54%	5	111	62%	12	4
	<i>Mechanics and maintenance</i>	21	36%	18	53	44%	13	74	41%	24	14
	<i>Security management</i>	32	54%	9	56	46%	11	88	49%	20	11
	<i>Facility management</i>	21	36%	18	34	28%	18	55	31%	28	18
	<i>Communication systems management</i>	28	47%	13	61	50%	8	89	49%	17	9
	<i>Information literacy¹</i>	46	78%		82	68%		128	71%	8	
	<i>Knowledge of donor regulations</i>	26	44%	15	46	38%	15	72	40%	25	15
	<i>Ethical conduct</i>	9	15%	24	14	12%	25	23	13%	39	26
	<i>Reporting¹</i>	47	80%		79	65%		126	70%	10	
	<i>Liaison with other organizations</i>	33	56%	7	44	36%	16	77	43%	23	13
	<i>Training</i>	34	58%	6	83	69%	3	117	65%	11	3
<i>Team player</i>	30	51%	12	54	45%	12	84	47%	21	12	
<i>Ability to work under pressure¹</i>	40	68%		49	40%		89	49%	17		

*revisions of the T-shaped framework in *italics*, ¹lower level in the coding hierarchy, ²total ranking including lower level hierarchies, ³ final ranking after removing lower level hierarchies

Table 2: Group split

	Group	N	Mean	SD	Std. Error Mean	F	t
Finance and accounting incl. budgeting	Other	121	1,12	,988	,090	,986	,249
	Haiti	59	1,08	1,005	,131		
Information technology management	Other	121	,33	,746	,068	9,686	1,615
	Haiti	59	,17	,562	,073		
Change management	Other	121	,03	,256	,023	4,058	1,420
	Haiti	59	,00	,000	,000		
Marketing	Other	121	,03	,256	,023	4,058	1,420
	Haiti	59	,00	,000	,000		
Project management	Other	121	,36	,775	,070	5,754	1,174
	Haiti	59	,24	,625	,081		
Strategic management	Other	121	,18	,577	,052	3,713	,939
	Haiti	59	,10	,443	,058		
Customer relationship management	Other	121	,03	,256	,023	,002	-,021
	Haiti	59	,03	,260	,034		
Supplier relationship management	Other	121	,55	,894	,081	,002	,022
	Haiti	59	,54	,897	,117		
Risk management	Other	121	,03	,256	,023	2,184	-,739
	Haiti	59	,07	,365	,048		
Human resource management incl. recruitment	Other	121	,77	,973	,088	1,196	-,506
	Haiti	59	,85	,997	,130		
Negotiation	Other	121	,55	,894	,081	,002	,022
	Haiti	59	,54	,897	,117		
Leadership	Other	121	,66	,945	,086	6,431	-1,624
	Haiti	59	,92	1,005	,131		
Problem solving	Other	121	,21	,622	,057	60,679	-3,605**
	Haiti	59	,71	,966	,126		
Stress management	Other	121	,05	,312	,028	3,315	-,911
	Haiti	59	,10	,443	,058		
Customs, import and export	Other	121	,30	,715	,065	42,388	-3,357**
	Haiti	59	,78	,984	,128		
Transportation management	Other	121	1,07	1,001	,091	34,281	-2,854**
	Haiti	59	1,49	,878	,114		
Inventory (incl. asset) management	Other	121	1,49	,877	,080	23,020	-2,362*
	Haiti	59	1,76	,652	,085		
Warehousing	Other	121	,99	1,004	,091	26,140	-2,881**
	Haiti	59	1,42	,914	,119		
Purchasing and procurement	Other	121	1,50	,867	,079	12,661	-1,729
	Haiti	59	1,71	,696	,091		
Forecasting	Other	121	,12	,469	,043	,269	-,260
	Haiti	59	,14	,507	,066		
Logistics information systems	Other	121	,93	,998	,091	,094	-,950
	Haiti	59	1,08	1,005	,131		
Emergency preparedness	Other	121	,32	,733	,067	,523	-,429
	Haiti	59	,37	,763	,099		
Design and implementation of logistics policies	Other	121	1,04	1,003	,091	2,553	-,380
	Haiti	59	1,10	,995	,130		
Fleet management	Other	121	1,07	1,001	,091	49,944	-3,418**
	Haiti	59	1,56	,836	,109		
Mechanics and maintenance	Other	121	,88	,996	,091	5,111	1,059

	Haiti	59	,71	,966	,126		
Security management	Other	121	,92	,997	,091		
	Haiti	59	1,05	,990	,129	,832	-,845
Facility management	Other	121	,56	,903	,082		
	Haiti	59	,71	,966	,126	3,596	-1,022
Communication systems management	Other	121	1,00	1,000	,091		
	Haiti	59	,98	1,008	,131	,445	,106
Knowledge of donor regulations	Other	121	,76	,975	,089		
	Haiti	59	,86	,991	,129	,507	-,669
Ethical conduct	Other	121	,23	,642	,058		
	Haiti	59	,31	,725	,094	1,866	-,692
Reporting	Other	121	1,31	,956	,087		
	Haiti	59	1,59	,812	,106	19,880	-2,100*
Liaison with other organizations	Other	121	,73	,966	,088		
	Haiti	59	1,10	,995	,130	1,734	-2,417*
Training	Other	121	1,37	,932	,085		
	Haiti	59	1,15	,997	,130	5,928	1,415
Team	Other	121	,89	,998	,091		
	Haiti	59	1,02	1,008	,131	,640	-,782
<i>Ability to work under pressure</i>	Other	121	,81	,986	,090		
	Haiti	59	1,36	,943	,123	5,390	-3,593**

**p<0.01, *p<0.05