Skill and knowledge requirements for logistics professionals in the apparel industry of Bangladesh: An importance-expertise matrix analysis

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Abstract:

This paper provides an assessment of the skills needed for entry-level logistics professionals in Bangladesh's apparel industry and suggests the critical skill areas that require improvement. Two studies were conducted to get the responses from supply chain and logistics professionals who have direct interactions with entry-level logistics professionals in the workplace. In study 1, an Importance-Expertise Matrix (IEM) analysis was conducted to provide an assessment of the relative importance and expertise of 40 skill items and investigate the skill gaps. The results reveal that 27.5% of the skill items have a noticeable gap between their importance and expertise level, indicating further improvement is needed. In Study 2, a qualitative approach was used, and the findings reinforced those of Study 1 and offered new and important information about skill and knowledge requirements amid the COVID-19 pandemic. This research offers implications for the apparel industry, academia, policymakers, and training agencies in Bangladesh.

Keywords: skill requirement | logistics | apparel industry | Bangladesh | importance-expertise matrix | supply chain management skills | COVID-19

Article:

In a changing world, as the global competition intensifies and the international trade complexity continues to evolve, top-performing companies highlight the significance of logistics as the secret of maximising profitability (Christopher, 2011). The global apparel industry is structured in such a way that suppliers are widely spread across the globe and people in different geographic locations contribute to manufacturing a single product (Ha-Brookshire, 2012). This is one of the main reasons for emphasising the logistics operations by firms in the apparel industry. Bangladesh has become one of the trustworthy manufacturing and exporting hubs for the global apparel trade (Lu, 2021), securing 6.4% of the global apparel market share which was next to China in 2019 (WTO, 2019). The ready-made garment (RMG) sector was the biggest driver of

large-scale industrial job creation in Bangladesh during the 2000s (Farole, Cho, Bossavie, & Aterido, 2017). Bangladesh exported an amount of $40.535 billion in the fiscal year of 2018–2019 (Export Promotion Bureau of Bangladesh, 2019). Around 84% ($34.133 billion) of the total export income came from RMG (Bangladesh Bureau of Statistics, 2019; Export Promotion Bureau of Bangladesh, 2019).

To ensure more modernisation and economic progress of Bangladesh, the implementation of an efficient logistics system is very important (Russell & Hoag, 2004). Not only infrastructural development but also highly skilled and qualified employees are required for ensuring substantial development in logistics operations. Logistics is a fundamental component of supply chain management (SCM), which is the management of upstream and downstream relationships with suppliers and customers; thus, logistics professionals need comprehensive skills and knowledge to coordinate the interconnected functions of logistics and supply chain systems (Rahman & Yang, 2012). Successful logistics professionals must have proficiency in managing logistics functions as well as leading people in a multicultural and complex environment (Gammelgaard & Larson, 2001; Mangan & Christopher, 2005; Tate, Ellram, & Kirchoff, 2010).

Skills needed by apparel industry professionals have been transformed as the result of dynamic changes in the global apparel industry in the last decade (Chi, Liu, Salusso, & McCracken, 2018). Lack of highly skilled logistics professionals is a global problem (LeHew & Mayer, 2005). This type of problem was previously examined by some researchers in other geographical areas (Gammelgaard & Larson, 2001; Rahman & Yang, 2012). But this problem is particularly significant for Bangladesh's apparel industry professionals due to the rapid development in Bangladesh's apparel industry and the industry's leading role in the country's economic development (Farole et al., 2017).

Despite the critical role of logistics in the Bangladeshi apparel industry, there is little research on examining necessary skillsets for entry level logistics professionals of the apparel industry in Bangladesh. For the purpose to fill the literature gap, two studies (Study 1 and Study 2) were conducted. Study 1 provided an assessment of the skills needed for successful entry level logistics professionals in the Bangladesh apparel industry and suggest the critical skill areas that require improvement using Importance-Expertise Matrix (IEM) analysis. Study 2 was from a qualitative approach via in-depth interviews with Bangladesh's apparel practitioners to acquire a deeper understanding of the skill and knowledge requirements of entry-level logistics professionals. The findings could be beneficial to the apparel industry of Bangladesh and educational institutions to set skill criteria for the logistics professionals and be useful in facilitating the development of new strategic directions to fostering competitiveness of Bangladesh's apparel industry.

Literature review

Dynamic capabilities

Dynamic capability is the capability of an organisation to skillfully utilise its prevailing internal and external abilities in order to cope with the volatile and fluctuating environments (Teece, Pisano, & Shuen, 1997). Whether a firm can develop and utilise its dynamic capabilities to

maintain its competitiveness in the volatile marketplace rest in the hands of its supply chain professionals and the development of their skills and competences (Essex, Subramanian, & Gunasekaran, 2016). The study of Wang, Jaw, and Tsai (2012) discussed the role of professionals to build complementary and co-specialisation resources of a firm. Their study ultimately pointed out the significance of developing human capital and illustrated how professionals could act as a strategic resource for business firms to attain sustainable competitive advantage (Wang et al., 2012). This study focused on the skill sets that could be explored and exploited by the entry level logistics professionals of the Bangladeshi apparel industry to gain a sustainable competitive advantage in this ever-changing business environment.

Logistics and supply chain management (SCM) skills

The discipline of logistics evolved out of the supply chain management (SCM) concept (Bechtel & Jayaram, 1997). Logistics is the segment of the supply chain process that plans, implements, and controls the efficient and effective flow and storage of goods, services, and related information from the point of origin to the point of consumption in order to meet customers' requirements (Cooper, Lambert, & Pagh, 1997). Logistics requires the coordination of activities within and between companies and the supply chain (Gammelgaard & Larson, 2001). For this reason, logistics and supply chain management faces a broader job description encompassing outbound and inbound information as well as material flows (Gammelgaard & Larson, 2001).

There are a lot of areas to improve to attain the high level of efficiency (Heaslip et al., 2019) in each step of the supply chain and it is vital to recruit and train professionals with the latest skillsets (Pekkanen, Niemi, Puolakka, Pirttilä, & Huiskonen, 2020). According to Murphy and Poist (1991, 2006), logistics managers are required to be experts in three skill areas: business, logistics, and management. Gammelgaard and Larson (2001) indicated a three-factor model of SCM skills for logistics managers: managerial/interpersonal basic skills, technological/quantitative skills, and SCM core skills. They pointed out the significance of better communication skills for logisticians, both downward and upward communication within the organisation, as well as being able to communicate across functions and organisations in order to coordinate the supply chain.

Previous studies indicate that logistics and supply chain managers regard themselves as 'managers first and then logisticians' with necessary skills and proficiencies that comprise both general management skills and competencies and specific logistics/supply chain skills and competencies (Bak, Jordan, & Midgley, 2019; Mangan & Christopher, 2005). Carter and Carter (2007) emphasised that success in SCM will depend on whether organisations 'can attract, develop, and retain individuals with the right skills and capabilities to excel in the future' (Carter & Carter, 2007, p. 40). Top management of logistics must adopt specific strategies to develop overall supply chain competencies, such as adopting a holistic approach, managing perceptions, building and maintaining strong networks, balancing centralised management with local input, and improving leadership skills at all levels (Russell & Hoag, 2004). According to de Abreu and Alcântara (2015), managers should foster a supply chain mindset and develop some cross-functional skills such as technical skills and team orientation. The ability to make decisions, the ability to work in teams, interpersonal communication, analytical, and negotiation skills are the most important management skills of logistics managers (Mageto & Luke, 2020).

Campos, Lima, Silva, and Fernandes (2019) conducted a study to analyze the professional skills in SCM in the supermarkets in Brazil. The findings of their study indicated that business ethics, problem-solving skill, leadership, and communication skill are the top important skills. Myers, Griffith, Daugherty, and Lusch (2004) researched high-rank logistics managers and found that logistics professionals should have these skills: interpersonal, operationalised, corporate, leadership, decision making, and group management. Christopher (2012) concluded his study stating that logistics professionals must have technical, behavioural, and managerial skills for managing challenges and changes beyond boundaries. According to Dotson, Davè, and Miller (2015), some skills have great importance for logistics professionals, including listening, critical reasoning, problem-solving, motivation, ability to perform under pressure, and ability to prioritise. Tatham, Wu, Kovács, and Butcher (2017) named the logistics professionals as managers. They argued that logistics professionals are managers first and then logisticians.

As the business environment gets complex day by day, the curricula in the discipline of logistics and supply chain education become more interdisciplinary in the recent years (Gibson, Kerr, & Fisher, 2016). According to Jordan and Bak (2016), the curricula of the higher educational institutions are the foundation of skill transfer and those curricula should be consistent with the skill requirement and competency of industry. This research focused on the requirement of the necessary skills for the entry level logistics professional in Bangladeshi apparel industry to understand whether those skills are consistent with the industry expectations.

Importance-expertise matrix (IEM) analysis

In 1977, Martilla and James proposed an analysis that was named the importance-performance matrix (IPM); and since then, it has been one of the more widely known gap-based methods (Martilla & James, 1977). This analysis was designed as an easily applicable tool to measure the performance and importance of the features or attributes of a product or service. An attractive feature of this matrix is that the results may be graphically displayed on an easily interpreted, two-dimensional grid (Martilla & James, 1977).

Some researchers used this matrix in modified ways (Bacon, 2003). This matrix is also termed as IEM (Importance-Expertise Matrix). The usefulness of the IEM matrix lies in its ability to illustrate both importance and expertise perspectives and the ability to focus on the relative improvement priorities. An IEM analysis uses a 2×2 format. The vertical axis represents the perceived importance of the attributes from low to high, and the horizontal axis represents the perceived expertise of the attributes from low to high. Thus, it generates four quadrants, such as non-critical skills, competence in non-critical skills, critical skills gap, and competence in critical skills (Martilla & James, 1977; Rahman & Yang, 2012). Table 1 interprets the four quadrants of IEM.

Table 1. Interpretation of the quadrants of the IEM (Martilla & James, 1977).

Quadrants	Levels of importance and expertise	Interpretation
Non-critical skills	Low–Low	Both importance and expertise levels of the measures are perceived to be low. This suggests that the skills that fall into this quadrant should get low priority for improvement.
Competence in non-critical skillsets	Low–High	The importance level is perceived to be relatively low, however, expertise level is perceived to be relatively high. This suggests that the resource has not been allocated to the right areas.
Critical skill gap	High–Low	Importance levels of the measures are perceived to be high, whereas, expertise measures are perceived to be relatively low. This means that management must concentrate their attention on these measures.
Competence in critical skills	High–High	Both importance and expertise measures are perceived to be high. This suggests that the organisation must keep up the good work.

Study 1

Method

Research design

Based on a comprehensive review of the literature on the skills important for logistics and SCM professionals, a total of 58 skills were extracted from the literature. After a thorough examination of these skills, 18 skills, which were recognised as general management skills or strategic capability rather than skills in logistics, were excluded from the list. The skills were also adjusted to avoid repetition and ensure appropriateness in the current business environment. Finally, a total of 40 skills were considered for this study. Some of them could be present in any other business field, but others were specific competence attributes that were vital to logistics and supply chain managers in the apparel industry. Using expert opinion, these were grouped into two categories of hard and soft skills (Jacobs & Karpova, 2020). Skills related to technical, logistics, and supply chain functional skills were included in the hard skill category, and relevant management skills were included in the soft skill category (Rahman & Yang, 2012). A total of 20 skill items were chosen for the hard skill category, and 20 skills were chosen for the soft skill category (Table 2).

Table 2. Mean values, standard deviations, and mean differences of the skills.

No	Skill item	Importance		Expertise		Mean diff.	*t*-Value
		Mean	Std. dev.	Mean	Std. dev.		
Soft skills							
5	Communication skill (verbal)	4.49	0.85	2.91	1.38	1.57	5.760***
1	Ability to plan and prioritize	4.46	0.82	3.89	0.76	0.57	2.889**
4	Communication skill (written)	4.37	0.91	3.71	0.86	0.66	2.836**
8	Customer focus	4.34	0.94	3.83	0.89	0.51	2.398*
9	Decision making	4.17	1.04	3.57	1.12	0.60	2.859**
17	Negotiation skill	4.14	1.12	2.89	1.28	1.26	5.975***
3	Business process improvement	4.03	0.95	2.94	1.00	1.09	4.332***
18	Networking skill	3.91	1.01	2.86	1.06	1.06	4.712***

No	Skill item	Importance		Expertise		Mean diff.	*t*-Value
		Mean	Std. dev.	Mean	Std. dev.		
21	Procurement/purchasing management	3.83	1.04	3.51	0.98	0.31	1.247
6	Conflict management	3.80	0.96	2.97	1.07	0.83	3.660**
13	Green logistics/environmental issues	3.69	1.11	2.80	1.11	0.89	3.895***
36	Team orientation	3.60	1.03	2.80	1.08	0.80	3.308**
37	Foreign language	3.34	1.19	2.89	1.08	0.45	1.961
23	Spreadsheet abilities	2.97	1.07	2.91	1.17	0.06	.218
25	Team work	2.94	1.19	2.94	1.20	0.00	.000
7	Cross-functional coordination skill	2.91	1.07	2.89	1.08	0.02	.107
16	Motivation skill	2.91	1.12	3.06	1.08	0.12	−.596
2	Business ethics	2.91	1.38	3.60	0.88	0.69	−2.420*
15	Leadership	2.74	1.29	3.41	0.98	0.67	−3.438**
20	Problem solving skill	2.71	1.07	2.91	1.20	0.20	−.684
Hard skills							
26	Time management	4.49	0.82	4.00	0.84	0.49	2.186*
12	Inventory management	4.00	1.19	2.94	1.23	1.06	3.846***
24	Supply chain design	3.97	1.04	2.74	1.12	1.23	4.733***
27	Transportation and related regulation message	3.91	1.01	3.69	0.83	0.22	1.136
28	Production planning and controlling	3.91	1.27	3.31	1.11	0.60	2.663*
35	Customer service	3.85	1.24	3.69	0.76	0.16	.702
30	Distribution planning	3.83	1.10	3.63	0.65	0.20	1.022
31	Use of logistic related software	3.82	1.23	3.40	0.95	0.42	1.735
14	Knowledge of the industry	3.74	1.07	3.37	0.81	0.37	1.710
29	Ability to manage risk	3.71	1.32	2.88	1.21	0.82	2.997**
22	Quality management	3.65	1.26	3.34	1.00	0.30	1.429
34	ISO 14000 standards	3.57	1.22	3.14	1.00	0.43	1.812
19	Order processing	2.97	1.20	3.31	1.11	0.34	−1.582
32	Reverse supply chain	2.94	1.19	2.94	1.00	0.00	.000
10	Demand forecasting	2.91	1.04	2.74	1.29	0.17	.692
11	Facility location	2.88	1.08	3.09	1.04	0.20	−.815
39	Knowledge of latest technologies	2.88	1.08	2.83	1.10	0.06	1.000
40	Knowledge about infrastructure differences	2.85	0.94	2.80	0.96	0.06	.264
33	Return goods handling	2.85	1.03	2.89	1.23	0.03	−.107
38	Change management	2.83	1.12	2.77	1.17	0.06	.572

Note: Sample size $N = 35$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

A survey questionnaire was designed to collect the opinions of supply chain and logistics professionals on the importance and expertise of the 40 skill items. An interview approach was used to get the responses and a snowball sampling technique was used to recruit those professionals. Using interview approach to gather responses helped the questionnaire respondents to better understand the study purpose and it also provided an opportunity to answer their questions during their completion of the questionnaire. This approach aimed to improve the quality of responses. At the beginning of the questionnaire, the following instruction was provided:

> To perform logistics and supply chain functions efficiently in your company, how important is each skill item for entry level logistics professional? For entry level logistics professionals in your company, how competent are they in these skills?

Respondents were asked to rate the importance of each skill for their company and then were asked to rate the perceived expertise of entry-level professionals in each skill. The 5-point Likert-type scale for both questions ranged from 1 (very low importance/expertise) to 5 (very high importance/expertise). The survey questionnaire was in the English language.

Data collection

Forty-four managers and executives were approached, but in total 35 interviews were conducted, a response rate of 80%. It should be acknowledged that the sample size of Study 1 is limited. However, this study is comparable to published research using importance-performance analysis (Salter, Hampton, Winchester, Katz, & Evensky, 2011; Wagner, Sancho-Esper, & Rodriguez-Sanchez, 2020). The 35 interviewees were from 20 organisations, including six knit composite factories, three local and foreign woven RMG factories, two denim factories, three liaison offices of multinational brands, one sweater sourcing liaison office, one garment accessories company, and four local apparel sourcing companies. The interviewees were the logistics professionals working in the areas of merchandising, planning, procurement, production coordination, and supply chain. The average years of relevant experience of the questionnaire respondents was 7.8. All of them had direct interaction with entry-level logistics professionals in the workplace. Only 14% of the interviewees were female, and 86% of the respondents were male.

Results and discussion

Ten most important skills

Ten most important skills were identified based on the mean scores of the importance provided by the respondents. Among the ten most important skills, seven were soft skills (5-communication skill (verbal), 1-ability to plan and prioritise, 4-communication skill (written), 8-customer focus, 9-decision making, 17-negotiation skill, and 3-business process improvement), and three were hard skills (26- time management, 12-inventory management, and 24-supply chain design). Figure 1 illustrates the ten most important skills with their expertise levels. It was seen that the level of expertise varies from time management (4.00) to supply chain design (2.74). The gap between importance and expertise level was particularly substantial for communication skill (verbal), negotiation skill, business process improvement, inventory management, and supply chain design.

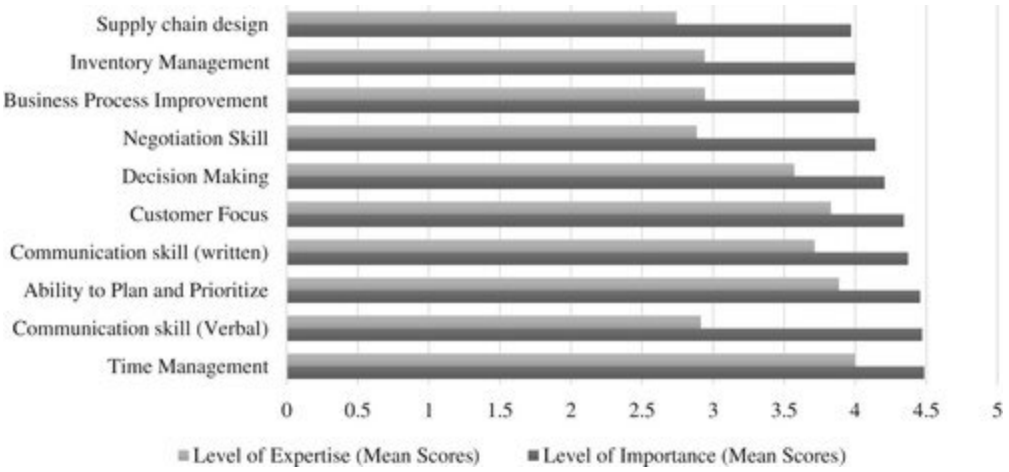

Figure 1. Top ten most important skills and their level of expertise.

Five skills with highest level of expertise

The top five skills with the highest expertise scores were identified. They were 26-time management, 1-ability to plan and prioritise, 8-customer focus, 4-communication skill (written), and 27-transportation related regulation message. Among these five, 1-ability to plan and prioritise, 8-customer focus, and 4-communication skill (written) are soft skills, and the other two are hard skills. It should be noted that time management, ability to plan and prioritise, communication skill (written), and customer focus were found to be in both the list of top five most important skills and the list of top five skills with highest level of expertise. This indicates that entry level logistics professionals in the apparel industry of Bangladesh have competency in these four critical skills.

Top ten skill gaps

Gaps are determined as the differences between the mean scores of importance and expertise. Gap analysis showed that 82.5% of the importance ratings (33 out of the 40 skill items) are higher than the expertise ratings. The gap of a particular skill indicates the strength or weakness of that skill. Figure 2 shows the top ten skill gaps. Among these ten skill gaps, seven are soft skills (5-communication skill (verbal), 17-negotiation skill, 3-business process improvement, 18-networking skill, 13-green logistics/environmental issues, 6-conflict management, and 36-team orientation) and three are hard skills (24-supply chain design, 12-inventory management, and 29-ability to manage risk).

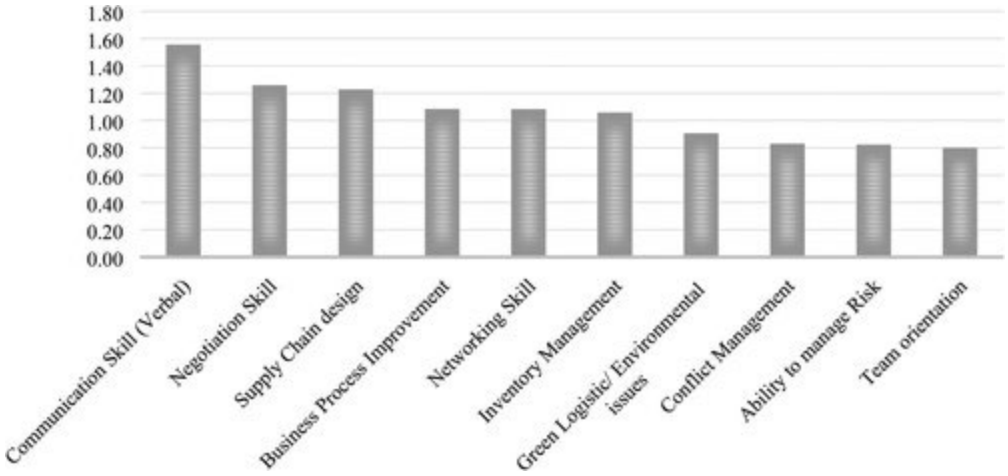

Figure 2. Top ten skill gaps (mean differences).

IEM matrix analysis for all skills

The skills in hard and soft skill categories were assessed based on the IEM analysis. The mean ratings and standard deviations of importance and expertise for skills in the soft and hard skill categories are given in Table 2. Table 2 shows that the perceived expertise in the soft skill category is significantly below the importance level in 11 soft skills (5-communication skills (verbal), 1-ability to plan and prioritise, 4-communication skills (written), 8-customer focus, 9-decision making, 17-negotiation skill, 3-business process improvement, 18-networking skill, 6-conflict management, 13-green logistics/environmental issues, and 36-team orientation). The gaps between the means of the importance of these 11 soft skills and the means of the perceived expertise of entry level professionals were found to be high and were statistically significant ($p < 0.05$). For only two soft skills (Table 2), 2-business ethics and 15-leadership, the perceived expertise level were higher than the importance level ($p < 0.05$).

Table 2 also shows that in the hard skill category, for five hard skills (26-time management, 12-inventory management, 24-supply chain design, 28-production planning and controlling, and 29-ability to management risk), the level of the expertise of entry level logistics professional was significantly below the importance level; the gaps between means of importance and expertise scores were statistically significant ($p < 0.05$). For the majority of the hard skills, the gap was not statistically significant.

The overall distributions of the skills in the IEM quadrants are shown in Figures 3 and 4. In the IEM (Figure 3), the score 3.00 (higher than the midpoint and rounded up) was used as the coordinate for both importance and expertise. Then all the skills were placed into the four quadrants of the 2 × 2 matrix (Figures 3 and 4). The IEM analysis illustrates that 10 or 25% of the skills fall in the quadrant of *non-critical skills* that are of low importance and low expertise (7-cross functional coordination, 10-demand-forecasting, 20-problem solving skill, 23-spread sheet abilities, 25-team work, 32-reverse supply chain, 33-return goods handling, 38-change management, 39-knowledge of the latest technology, and 40-knowledge about infrastructural differences). In this quadrant, six are hard skills, and four are soft skills. The skills of this quadrant should be of low priority for improvement (Martilla & James, 1977; Wagner et al., 2020).

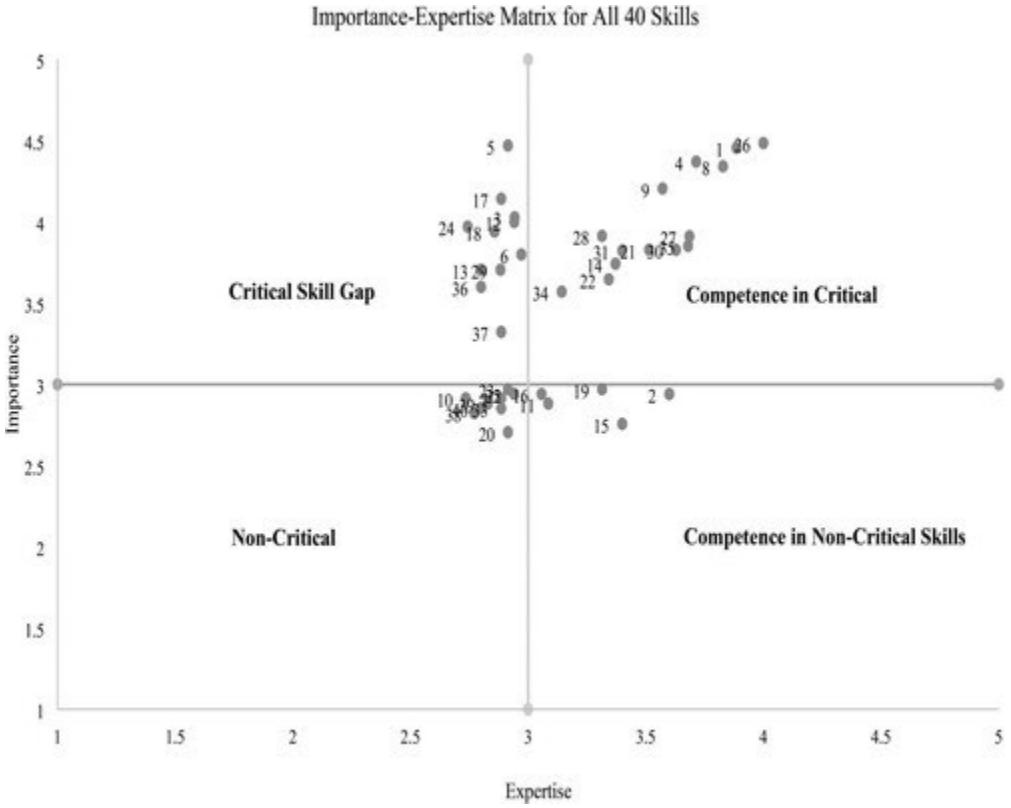

Figure 3. Importance-expertise matrix for all skills.

Five or 12.5% of the skills were in the quadrant of *competence in non-critical skills* that indicated low importance but high expertise (2-business ethics, 11-facility location, 15-leadership, 16-motivation skill, and 19-order processing). This quadrant was introduced as 'possible overkill' by Martilla and James (1977), and it was labelled as the 'overstatement quadrant' by Wagner et al. (2020).

IEM analysis indicates that 14 or 35% of the skills are in the quadrant of *competence in critical skills* which refer to high importance and high expertise (1-ability to plan and prioritise, 4-communication skill (written), 8-customer focus, 9-decision making, 14-knowledge of the industry, 21-procurement/ purchasing management, 22-quality management, 26-time management, 27- transportation and related regulation message, 28-production planning and controlling, 30-distribution planning, 31-use of logistic related software, 34-ISO 14000 standards, and 35-customer service). Rahman and Qing (2014) and Prajogo and McDermott (2011) described this quadrant as 'keep up the good work' as initiated by Martilla and James (1977). Wagner et al. (2020) labelled this quadrant as 'excellence' which indicates that these skills of entry level logistics professionals are compatible with the needs of the industry. Out of these 14 skills, five skills were soft skills (36%), and nine were hard skills (64%). These results indicate that for the most important skills, Bangladeshi logistics professionals in the apparel industry show more expertise in hard skills than soft skills.

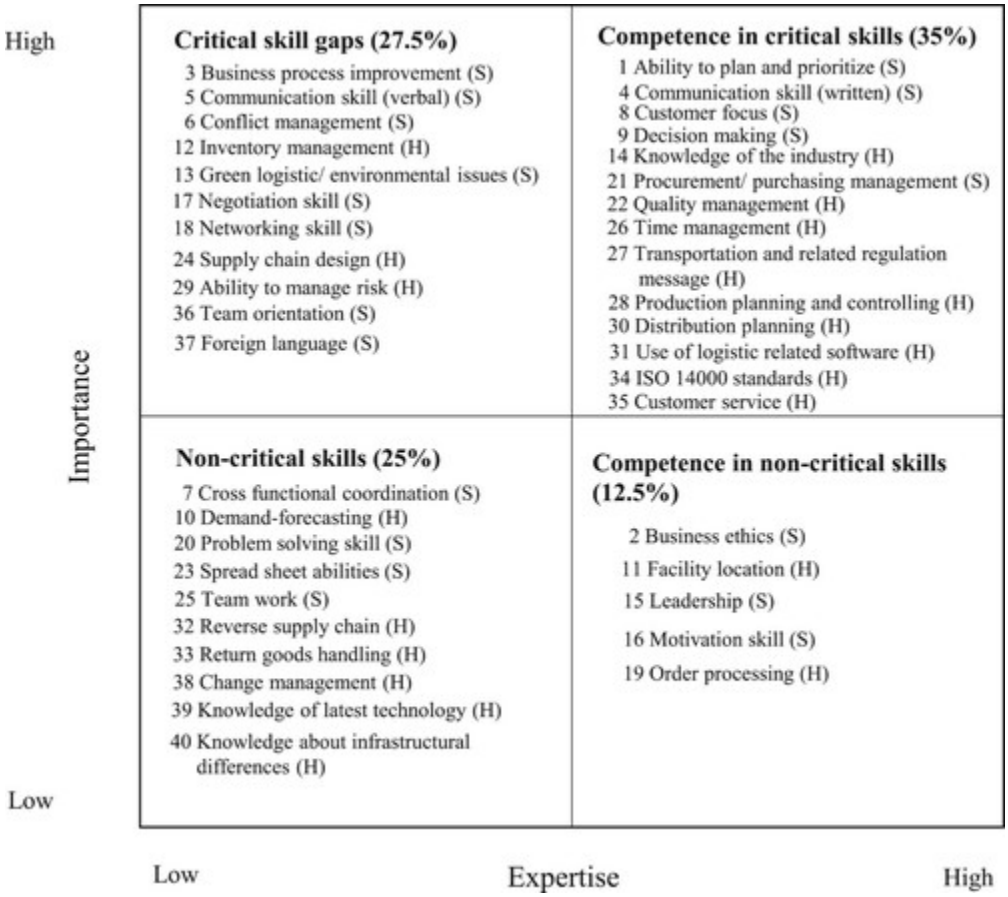

Figure 4. Overall distribution of all the skills in the importance-expertise quadrants.

Eleven or 27.5% of the skills have a noticeable gap between their importance and the level of expertise, and they are in the quadrant of *critical skill gaps* (3-business process improvement, 5-communication skill, 6-conflict management, 12-inventory management, 13- green logistics/ environmental issues, 17-negotiation skill, 18-networking skill, 24-supply chain design, 29-ability to manage risk, 36-team orientation, and 37-foreign language). This quadrant was described as 'concentrate here' by Martilla and James (1977) and was also indicated as 'area of improvement' by Prajogo and McDermott (2011). The skills of this quadrant should be given the highest priority for improvement (Wagner et al., 2020). In terms of these 11 critical skills, eight skills were soft skills (73%) and three were hard skills (27%), indicating that more effort was needed to improve soft skills.

Study 2

Method

Study 2 employs a qualitative approach which involved in-depth interviews with Bangladesh's apparel practitioners. After receiving Institutional Review Board approval, a purposive sample of seven industry practitioners from seven apparel companies was identified and the practitioners took part in the semi-structured interviews. Interview questions were designed as open ended. The interviewees were supply chain and logistics professionals in Bangladesh's apparel industry

who have active and direct interactions with entry-level logistics professionals in the workplace (Table 3). The years of experience of the interviewees range from 4 to 9 years. The key interview questions included 'What skills would you expect to be in need for entry-level professionals for the Bangladesh's apparel industry to adapt to the new trends in the global apparel market?' and 'Did you perceive any gap between the expected skills and actual skills of the entry-level logistics professionals? What could be done to reduce or eliminate the gap?'

Table 3. Description of the participants.

Participants	Experience (years)	Position
BD01	9	Merchandiser
BD02	5	Merchandiser
BD03	4	Senior Executive (Procurement)
BD04	6	Merchandiser
BD05	4	Merchandiser
BD06	5	Merchandiser
BD07	6	Senior Officer (Supply Chain Management)

The interviews were conducted either using video conferencing software (Zoom) or by phone and the interviews were recorded with the interviewees' consent. The interviews lasted 25–45 minutes each. All the recorded interviews were transcribed verbatim. After the transcription of the interviews, the researchers read the texts carefully across the transcripts and used a hermeneutic and iterative approach to identify the evolving themes and interpret the interview data.

Results and discussion

Theme 1: risk management

The interview participants repeatedly pointed out the importance of risk management skill. This finding from Study 2 supports and expands the findings from Study 1 as the skill 'ability to manage risk' was also found in the category of *critical skill gaps* of Study 1. As the interviews were conducted during the COVID-19 pandemic, this theme reflects the impact of the pandemic on the apparel supply chain. The COVID-19 pandemic has caused significant disruptions to the apparel supply chain; thus, the skill 'ability to manage risk' which was identified as a critical skill gap in Study 1, is even more critical during the pandemic. There is a significantly increasing expectation of the ability to manage risk for entry-level logistics professionals. One interviewee who was a merchandiser and working in a European fashion brand liaison office in Bangladesh explained,

> So, as the global apparel industry is changing very rapidly, if we consider what happens in the world, we can divide the situations between the two – before COVID and after COVID. So, it's very important for an entry level professional to focus on the upcoming challenges. What the challenges will be considering the global scenario and global trends is very important for these professionals. What could be coming in the future? Can they anticipate what is going to happen in future? Can they work proactively to reduce the challenges? So, how to manage the crisis is an important soft skill. (BD01)

Theme 2: global transportation knowledge

The globalisation of the apparel industry has accelerated the need for skills specifically for the global business environment. The professionals working in a particular geographical location should not restrict the knowledge and skill level pertinent to that geographical location; rather they should address the skills that might help the supply chain to resolve the global challenges. The global apparel supply chain has been significantly disrupted due to the pandemic and lockdown restrictions. Apparel professionals should focus on the rapidly changing environment of the global logistics and transportation amid the pandemic crisis. The IEM analysis in Study 1 shows that transportation and related regulations and knowledge of the industry were identified as the skills categorised in *competence in critical skills.* The qualitative data demonstrated that global transportation knowledge is extremely important in the apparel industry during the pandemic. As one interviewee articulated,

> Recently as a professional I'm also facing one challenge in global transportation and that is all the shipment management and the crisis of the space of different types of vessels. If I consider the most important hard skill in that case one should be well knowledgeable regarding the things that are happening in the transportation related issues of the world. The logistics things are mainly connected to sea shipment and air shipment and around 80 percent of the goods are shipped via sea in terms of export or import. (BD01)

Theme 3: forecasting skills

According to the interviewees, forecasting skills come with experience but still the entry-level professionals should have some basic skills to manage the demand forecasting and to anticipate future challenges in the market. It is interesting to note that the IEM analysis in Study 1 showed that demand-forecasting skill was identified as a skill in the category of *non-critical skills,* while customer focus and ability to plan were identified as the skills in the category of *competence in critical skills.* The global impact of the pandemic on the apparel supply chain sheds light on newer trends in the market which require a dynamic skill set. This theme implies the increasing importance of forecasting skills in the apparel industry during the pandemic. For example, one interviewee who was a merchandiser of an apparel manufacturing firm explained, 'Customer focus and demand forecasting skills became vital for the Bangladesh apparel industry to adapt to the new trends in the global apparel market' (BD05).

Theme 4: focus on practical knowledge

One of the important and common practices advised by the practitioners was 'focusing on practical knowledge'. The participants suggested that educational institutions should focus more on practical education with state-of-the-art technologies and real-world practices. The entry-level professionals should understand the practical implications of the basic functions like shipment, lead-time, and documents required for export-import and shipment management. One participant, who was a senior officer (supply chain management) of an apparel firm, stated,

> Some practical knowledge can be introduced in the curriculum to reduce or eliminate the gap. We could develop some courses focusing on logistics practices in the industry, and we can take suggestions from industry people who have been working in this area for a long period of time. (BD07)

Theme 5: collaboration between educational institutions and the industry

This theme demonstrates another critical strategy to reduce the skill gaps. Industry-academia collaboration is not a very common scenario in the developing countries like Bangladesh. According to the participants, the ideal collaboration creates a win-win situation for both the apparel industry and educational institutions. Educational institutions such as universities produce skilled workforce for the apparel industry and help the industry solve problems and enhance its competitiveness through research activities. The industry continually provides feedback about the skill levels of the professionals and also offers internship opportunities for college students. Focusing on practical knowledge (theme 4) is also dependent on the collaboration between educational institutions and the industry because the educational institutions must know the current industry practices to design their curricula in order to provide the state-of-the-art knowledge and skills to their graduates. For example, one interviewee who was a senior executive (procurement) of an apparel firm stated,

> I think our educational institutions should focus on 2 things more consciously: (1) More job-based education should be included in educational courses. (2) Increase education-industry collaboration so that students get the opportunity to learn practically from the educational stage. (BD03)

Conclusion

This research aimed to identify the critical skills required by successful entry level logistics professionals in Bangladesh. Two studies were conducted to achieve the research purpose. In Study 1, an IEM analysis was conducted to provide an assessment of the relative importance and expertise of 40 skill items and investigate the skill gaps. Results show only 12.5% of the skills (5) fall in the category of *competence in non-critical skills* (lower importance, higher expertise), and 35% of the skills (14) fall in the category of *competence in critical skills* (higher importance, higher expertise). The competence in these skills represented the dynamic capabilities that the apparel industry of Bangladesh possessed and played a critical role in the competitiveness of the country's apparel industry. The five skills that fall in the category of *competence in non-critical skills* suggest that the level of expertise of Bangladeshi entry level logistics professionals in these five skills is higher than the level of importance of these skill items. However, with the increasing role of the Bangladesh's apparel industry in the global apparel market, more emphasis will be placed on business ethics, leadership, and motivation skills. It is expected that these capabilities will bring opportunities for Bangladesh's apparel firms in achieving competitive advantage. In the quadrant of *competence in critical skills,* nine out of 14 skills identified as excellence were hard skills. This result is a notable finding of this study, which can address the performance of supply chain education of Bangladesh.

27.5% of the skills (11) fall in the category of *critical skill gaps* (higher importance but lower expertise), indicating significant improvement is needed for these 11 skills. Within this category, conflict management, inventory management, and foreign language are the three skills that were also identified by Rahman and Yang (2012) as the three critical skill gaps for Chinese logistic professionals. In addition, the quadrant of *critical skill gaps* includes the skill regarding green logistics/environmental issues, which was found as a non-critical skill by Rahman and Yang (2012) for Chinese logistics professionals. This indicates that Bangladeshi logistics professionals of the apparel industry have started considering skills related to environmental issues important. The majority of the skills in the *critical skill gaps* quadrant (eight out of 11) are soft skills, indicating that the educational institutions and companies must concentrate their attention more on soft skills. The study of Chi et al. (2018) also recommended putting more emphasis on the soft skills of the college graduates.

Study 2 reinforces the findings of Study 1 and provides additional important information about skill and knowledge requirements during the pandemic crisis. The findings of the in-depth interviews indicate that risk management, global transportation knowledge, and forecasting skills are crucial skills for entry-level logistics professionals in Bangladesh's apparel industry amid the COVID-19 pandemic. Development and utilisation of these dynamic capabilities are required by Bangladesh's apparel firms to survive in the challenging business environment. Likewise, in the qualitative interviews participants highlighted two strategies to reduce the critical skill gaps – focusing on practical knowledge and building collaboration between educational institution and industry.

Sourcing of RMG from low-cost-producing countries, especially Bangladesh, is now a common phenomenon. Successful logistics and supply chain managers' skills must evolve with the ever-changing supply chain in the global apparel industry. The ability of an apparel firm to maintain its competitiveness in the volatile marketplace depends on its logistics and supply chain professionals. Organisations must understand what skills to look for in potential employees. The academics may use the findings to set the curriculum to educate students and prepare the future workforce (Sun & Song, 2018) for Bangladesh's apparel industry. Collaboration between educational institutions and the apparel industry will improve the employability, and on-the-job performance of the graduates.

Several limitations in the study should be addressed, and they provide opportunities for future research. The study only focused on the apparel industry of Bangladesh and was conducted with snowball sampling. Future research may consider the apparel industry in other countries. Moreover, future longitudinal studies could be conducted to provide updates of the skill requirements for entry-level logistics professionals. In addition, considering that this study focuses on the skill requirements of entry-level logistics professionals, more research is needed to clarify further which skills are particularly required for mid-level, and top-level positions in the apparel industry of Bangladesh.

Disclosure statement

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