Original Research Paper*

A Study on Skills Gap: Beyond COVID

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Abstract

Keeping up with the pace of technological advancement is a challenge for companies of all shapes and sizes. It is increasingly crucial to reskill and upskill in the changing era of innovation, especially post-pandemic (Beyond COVID), and acquiring soft skills is imperative for success in the digital era. The importance of soft skills like teamwork, communication skills, problem-solving, and critical thinking is a growing demand, heightened especially during the pandemic while working remotely. Upskilling ensures employees' skillsets will not become obsolete. As you reskill your employees, you create a more well-rounded, cross-trained workforce, and increase your team's effectiveness (itagroup.com, n.d.).

According to the United Nations Department of Economic and Social Affairs, the equivalent of 255 million full-time jobs have been lost due to the pandemic, and 1.6 billion informal economy workers lacking a social safety net have been significantly affected. The recovery will be slow; global economic growth is expected to return to pre-pandemic levels only by 2025.

The pandemic has dramatically accelerated the need for new skills in the workforce, with social and emotional skills high in demand. The proportion of companies addressing empathy and interpersonal skills doubled in 2020, according to the newest McKinsey Global Survey on reskilling (McKinsey, 2021).

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Introduction

Skills Gap Analysis involves the comparison of actual performance with the potential or desired performance.

The skills gap analysis is an in-depth view of the most demanded skills required in the jobs which were published on various job portals. A skills gap analysis allows the industry to identify the mismatch between employees' current skills and those that are needed to achieve the organization's future success. It evaluates the current capabilities and compares them to what is required. (hays.com, n.d.). According to Mark Cuban, "To remain competitive, ditching degrees that teach specific skills or professions and opting for degrees that teach you to think in a big picture way, like philosophy, is a good investment" (CNBC make it, 2018).

According to 21st Century Competencies Ontario, "The most prominent 21st-century competencies found in international frameworks that have been shown to offer measurable benefits in multiple areas of life are associated with Critical thinking, Communication, Collaboration, and Creativity & Innovation" (21st Century Competencies, 2015). For our analysis, the jobs targeted were entry to mid-level positions and focused across four sectors: logistics, banking, telecommunications, and construction. The study focused on a Canada-wide job market. The duration of the study was five months.

***Original Research Papers** These papers report on original empirical research with a focus on teaching and learning, research and innovation, and insights and observations resulting from participation in a particular project or case study.

In this case study, we tried to find out which skills are required in the job market, and if there are any gaps among the programs offered by Humber College. This preliminary research will help Humber College to identify the gaps in skills developed at educational institutions and those needed by the industry; this will act as the first step in fostering ideas around skill-based learning and a much deeper conversation surrounding competency developments. The long-term purpose of the study is to ensure that Humber's students are competitively equipped to succeed in the workforce, as clearly defined in Humber's Strategic Plan 2018-2023 – Pillar #1: Career-Ready Citizens (Humber Strategic Plan, n.d.).

Background

The scope of this research study is to represent the list of most recurring skills in job postings and compare the results with Humber's program offerings. The data for the study was gathered by manually extracting information from job portals, such as Indeed, Glassdoor, LinkedIn, and other job boards. The information taken from each job posting provided us with the following details:

1. Job title
2. Seniority level
3. Province
4. Skills required
5. Name of company

Once the above information was gathered, we were able to use one of Scott's Directories databases to identify the following:

1. North American Industry Classification System (NAICS) categorization
2. Employee size
3. Type of industry

The data we gathered helped us narrow our search among the most repeated industry sectors: banking, logistics, construction, and telecommunications, which served as our initial benchmark.

The fields to source from this big batch of data were the following:

- Company Name
- Industry
- # Employees
- Estimated Sales
- Department
- Seniority Level
- Location
- Province
- Size
- Group
- Postal Code
- Job Title
- Source
- Initial Posting Date
- Skill
- Skill Description

The information categorized in the above format was helpful in grasping the big picture. More inferences were drawn, and patterns were identified from our initial dataset. Once the list of recurring skills was identified, we gathered information from Humber's program offerings, and the learning outcomes were translated as skills. (Please refer to Figure 6 in Section 7.0 Humber Skills Mapping: to view the match between skills required in industry and skills offered by Humber).

Method

Quantitative Research

Definition: A research strategy that focuses on quantifying the collection and analysis of data. The objective of quantitative research is to develop and employ mathematical models, theories, and hypotheses pertaining to phenomena.

Since this was a preliminary analysis, we used a Quantitative approach to begin a highly sought-after conversation in Industry and Academia. We maximized efforts to get a maximum number of open job postings in the job portals all over Canada. We narrowed our research into various categories like province, industry, and department to obtain the skills required.

Exploratory Research

Definition: Exploratory research intends merely to explore the research questions and does not intend to offer final and conclusive solutions to existing problems. This type of research is usually conducted to study a problem that has not been clearly defined yet.

Since the information is flowing from an uncontrolled data source, we had to understand the purpose behind each data field; therefore, some of the questions the research team addressed were:

a) What are we looking for? The scope of the search was limited to the skills described in the job descriptions.
b) Where do we gather the data from? Explored options to locate and gather data. We narrowed our search to popular job portals, such as LinkedIn, Indeed, Glassdoor, etc.
c) How to control the data? We defined the scope of the search and our criteria to company details, skills, and company demographics.
d) Why collect the data? The data was collected to understand skills most sought-after in the industry–this is a preliminary step to a more important topic of competency mapping.

Analytical Research

Definition: The analytical research usually concerns itself with cause-effect relationships and attempts to establish why it is that way or how it came to be.

Once the data was collected, we applied data cleaning and sorting techniques to the dataset for analysis and visualizations (Pedamkar, n.d.).

Findings & Outcomes

The data collected from LinkedIn, Indeed, Glassdoor and other job boards was organized and cleaned for further analysis. The data was separated into four industries: telecommunications, construction, banking, and logistics, and based on that, technical and soft skills were identified. In phase one of the research, the data was analyzed to understand the requirements of skills based on the geographics and target department for top organizations in each industry.

> *"The benefits of soft skills training can be hard to measure, but research reveals that it can bring a substantial return on investment to employers while also benefiting employees. Namrata Kala, an assistant professor of economics at MIT Sloan, with colleagues at the University of Michigan and Boston College, partnered with Indian garment manufacturer Shahi Exports Private to run a randomized controlled trial across five factories. They found that a 12-month soft skills training program delivered substantial returns."*
> *(Walsh, 2017).*

The following trends have been identified; the top 15 skills which were ranked based on most recurrences in the job postings were (See Figure 1):

1) Communication skills
2) MS office skills
3) Organizational skills
4) Teamwork
5) Problem-solving skills
6) Customer service skills
7) Relationship management skills
8) Team player
9) Time management skills
10) Leadership
11) Physical skills
12) Project management skills
13) Analytical skills
14) Multi-tasking skills
15) Detail-oriented

Further, the jobs were classified as entry-level (one to three years of experience), mid-level (four to ten years of experience), and senior-level (11+ years of experience). The data shows that construction occupies around 52% of the collected skills, followed by telecommunications (30%) and banking (17%).
(See Figure 2)

Based on the analysis, the maximum number of skills are required in entry-level positions, especially in the construction sectors, followed by telecommunications, banking, and logistics. Based on
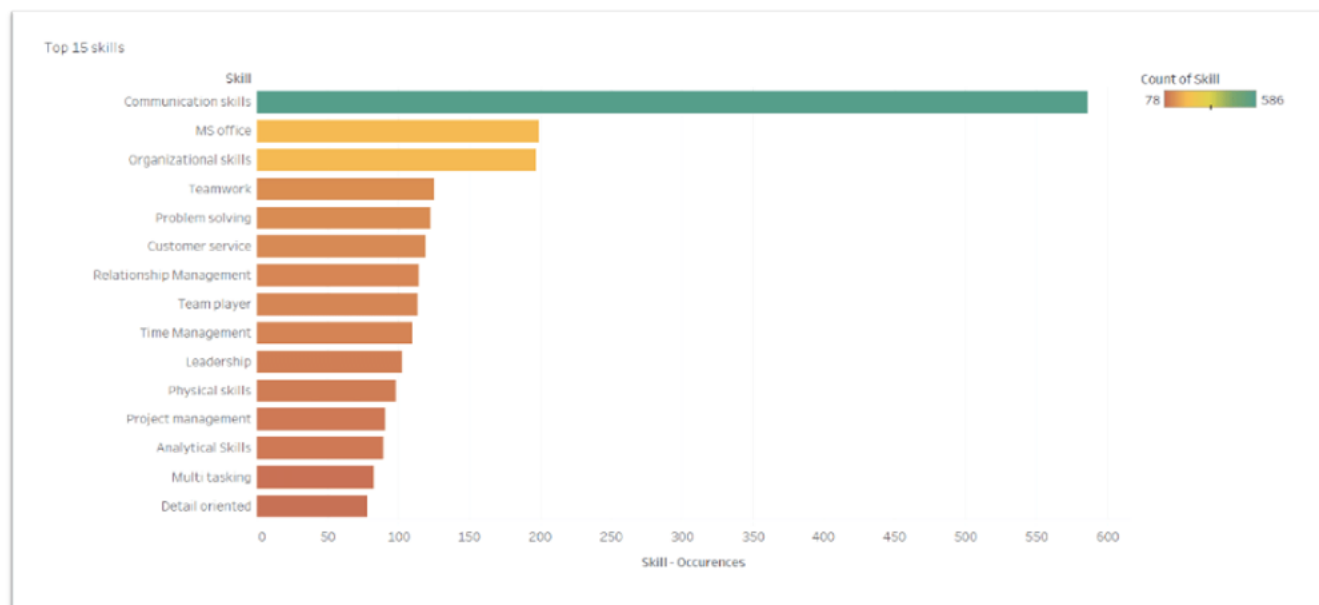

Figure 1. The top 15 skills that were recurring

information on job openings, the patterns suggest a huge demand for entry-level and mid-level candidates, while a limited number of senior-level positions are available. Further analysis of the jobs available vs. the required skills shows a constant ratio required to perform a job among all the four industries. Let's take an example: if we observe the two job titles - 1) .Net/C# Advisory Application Developer and 2) Customer Care representative, a total of six skills for each job title are required to perform the job as per the job posting. We noticed similar patters in all the job postings.

The Provincial Overview chart (Figure 3) shows the total skills required across Canada. Our analysis depicts that Ontario (green) remains the hub for all the industries with maximum job availability (1,196). The skills required also remain highest in Ontario (7,166), followed by Quebec (152 jobs, 1,467 skills) and British Columbia (68 jobs, 420 skills).

Skills Mapping with Programs Offered by Humber

The skills mapping was completed by taking the cumulative top skills in industry and mapping the skills to the learning outcomes defined under Humber programs. A red x denotes the skills gap, and a green tick mark denotes a match. (See Figure 4)

The preliminary analysis shows that Humber covers 51% of the skills in demand with industry. Although further analysis showed that skills offered at Humber match with technical skills required by industry, a closer look at soft skills is required. This analysis can be used for the following:

1. Initiating a conversation around skill-based learning.
2. Competency Mapping for the Canadian Workforce.
3. Rethinking how Educational Institutions work with industry partners to train students.

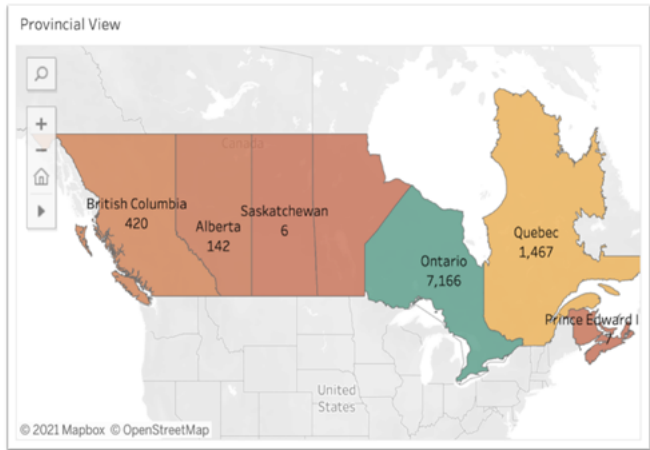Figure 2. Skills in each industry ranked by seniority

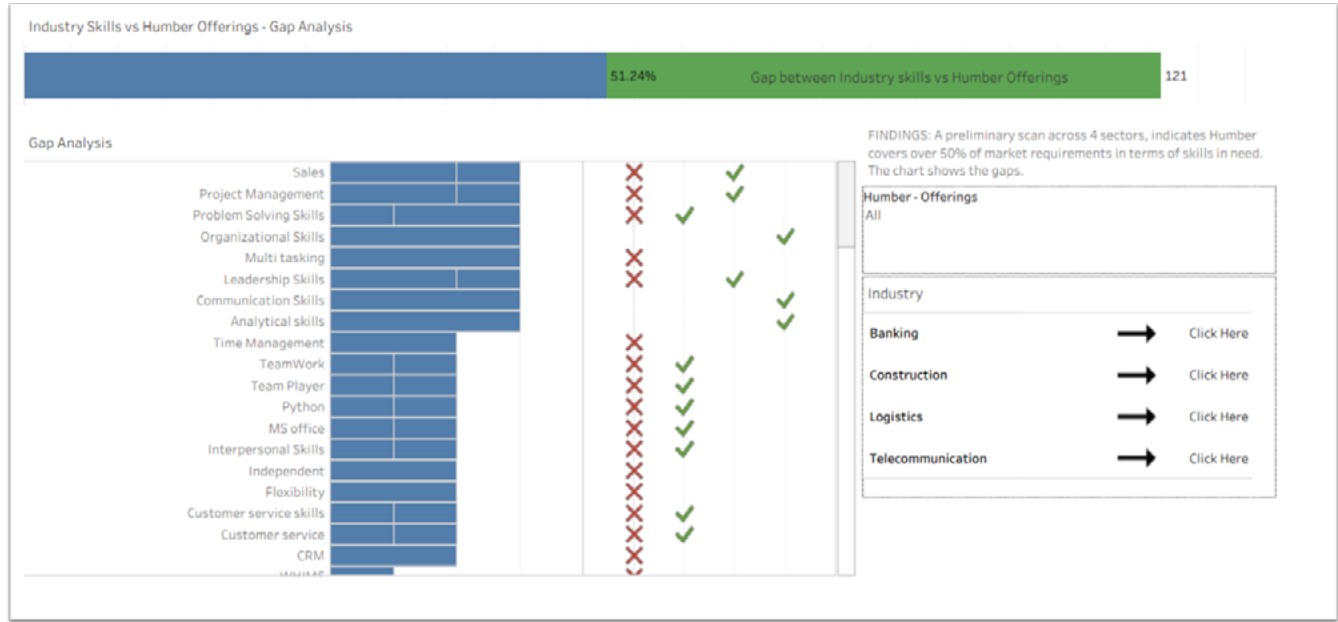Figure 3. Provincial Overview highlights accumulation of skills

Figure 4. Gap Analysis—Indicates skills that may not be covered by Humber

The current analysis covered four industries within Canada, considering 297 companies that offered 1257 jobs and needed 9258 skills. This analysis can be upscaled to cover a more significant number of industries that will provide further insights into the Canadian job market. A similar skill mapping model can be deployed in other educational institutions that would provide them with a way of upgrading their current educational resources.

Recommendations from This Research

It is important to stress that, in general, some of the certifications could be disregarding the importance of soft skills, which are built and developed through experience and practical knowledge. When practical experience is the primary source for soft skills, it is observed that in some of the outcomes from Humber programs, the focus is more on fundamentals like theoretical skills instead of practical fieldwork with real business cases and applications.

Having said that, we can use this study to assess the skills which are available in-house at Humber and enhance them. In addition to identifying the gaps and bringing them under Humber's umbrella, which in turn will benefit students and allow Humber to strengthen its Unique Selling Proposition (USP).

Further research into Competency Mapping and how educational institutions can support the Canadian workforce could potentially allow students to pick from a buffet of skills and ensure they can strengthen skills of their choice. For example, if we have an engineering graduate who is interested in gaining knowledge in Human Resource practices of Talent Management, Change Management and HR analytics, they will have the opportunity to learn and possibly change career path if they desire.

For that reason, we recommend interviews with industry Partners and go beyond Human Resources guidelines up to the end-users to collect the soft and technical requirements, which will enable us to build on the scope of this study and focus on meaningful results. We can build on the interviews with industry Partners and design training programs like Train the Trainer models to offer informed and enhanced training based on requirements of relevant industry and feedback from PACs to faculty members, thereby presenting the faculty members with an opportunity to stay current with the most recent market trends.

In addition, we believe that implementing a relational communications model, including collecting historical information and analyzing the data against other successful experiences, would be an asset that could lead to creating data repositories that might enhance the use of information as a learning system.

Performing this recurrently will create a learning loop–what skills are getting updated or needed in the job market–Humber can use this loop to assess and/or modify their programs to match the industry needs/demands.

Lastly, all these inputs can provide valuable information to build workshops or seminars for enhancing the skills required, assisting faculty and, ultimately, the programs, which will, in turn, enable students to acquire the most required skills and competencies.

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