Critical Core Skills Profiling and Development in the Singaporean Workforce

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Abstract
Soft skills, core competencies and generic competencies are exchangeable terminologies often used to represent a similar concept. In Singapore, such skills are currently being referred to as Critical Core Skills (CCS). To understand how CCS are demanded and developed in different occupations of the Singapore workforce, this study adopted a mixed method approach. Drawing on the CCS framework developed by Skills Future Singapore (SSG) in 2019, a survey instrument was developed to measure the importance and self-efficacy of the use of CCS. Drawing on the results from 2500 participants, we managed to profile them into seven occupation groups based on the different patterns of importance and self-efficacy. Each occupation group is labelled according to the most salient and demanded CCS. Concurrently, the CCS which may require further strengthening were also identified for each occupation group. A purposive sample was then drawn from survey participants based on the profiled occupation groups, for a follow-up semi-structured interview with the aim to understand how these selected participants used and developed the most demanded and least demanded CCS in various contextual settings. In total, 39 semi-structured interviews were conducted. The interview questions focused on the tasks under each CCS to get a sense of their use and development of these skills. Adopting the situated learning theory (SLT), the development pathways of CCS for these participants were drawn out. Practical recommendations on how training in various settings could further facilitate the development of CCS were also provided.

Keywords: Employability, Skills Development, Skills Use

Introduction

With the rapid transformation of the economy and business environment, as well as increasing digitalisation and adoption of technology at the workplace, there is a need to redefine the key skills to keep up with the future economy. This includes an increased emphasis on soft skills as part of the future work in the digital era. SkillsFuture Singapore (SSG) constantly scans the horizon to ensure the continued relevance and currency of its generic skills and competencies framework (GSCs), which was first introduced in 2016, for different groups of stakeholders.

In 2019, SSG reviewed the GSC and developed the Critical Core Skills (CCS) framework comprising 16 soft skills classified within three clusters. The CCS framework (Figure 1) was developed with inputs from more than 120 attendees from 78 organisations (e.g., Google, IBM, etc) across 28 industry sectors (e.g., professional services, manufacturing, etc). CCS are generally understood as valuable in many work contexts and transferable between those contexts, and therefore to be contrasted with technical skills and firm-specific skills. CCS are defined as:

> *...common, transferable skills that enable individuals to be employable and employed, facilitate their career mobility, and enable the acquisition of Technical Skills and Competencies relevant for specific job roles in the sector.* (SSG, 2023)

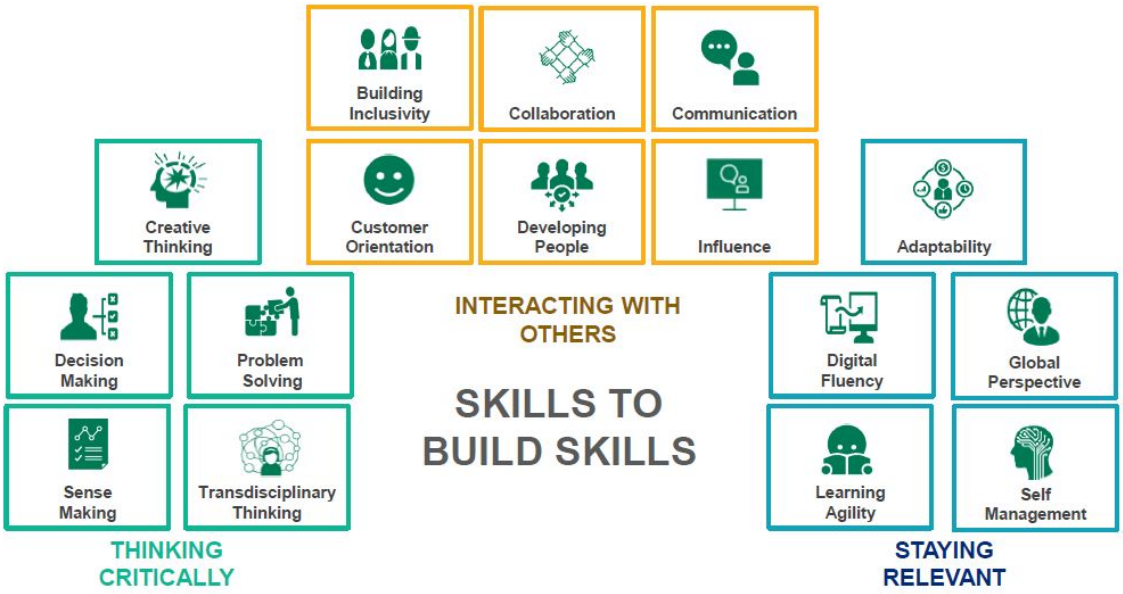


Figure 1: What are CCS in the Singapore context? (SSG, 2022)

The stated purpose of the CCS skills framework is to "create a common skills language for individuals, employers, and training providers". This further helps to facilitate skills recognition and support the design of training programmes for skills and career development. The Skills Framework is also developed with the objectives to build "deep skills for a lean workforce, enhance business competitiveness and support employment and employability" (SSG, 2023).

Measuring Critical Core Skills

One of the most prominent and well-used examples of measuring skills from the formative perspective is the U.S. Department of Labour's O*NET database. This extensive database provides scores of the importance of a large taxonomy of skills to each job listed in the Standard Occupation Classification. These constructs are defined clearly using task statements such as "using scientific rules and methods to solve problems". O*NET clearly employs the formative job analysis approach to skills, and provides an example of an extremely large scale, ongoing study which has taken years to complete.

Another extension of the formative, task-based approach towards skills research, and the methodology employed in this study, is found in the work of Ashton et al (2000). The measurement technique involved surveying workers on the importance of different activities and tasks to their work. The tasks were selected to represent common task-related skills within broad, pre-defined generic skills categories. This technique has been used heavily in skills research such as the Skills and Learning Survey (SLS) conducted at the Institute for Adult Learning in Singapore (in press) and the OECD's Programme for the Assessment of Adult Competencies (PIAAC) (OECD, 2013).

Ashton's method of skills measurement is well established and is appropriate from a theoretical perspective, due to its use of the formative approach understanding skills, and from a measurement perspective, as a survey-based approach. As such, this study draws heavily from this method.

Critical Core Skills Development

Situated Learning Theory (SLT) indicates that learning is a pervasive, embodied activity which involves the acquisition, maintenance, and transformation of the knowledge of practices through the processes of social interaction (Lave & Wenger, 1991). Knowledge of practices is an epistemological difference between "entities located in the head" and reconstructed learning from processes of social interaction. From a more relational social perspective, knowledge of practices is "distributed over both individuals and their environments, and learning is situated in these relations and networks of distributed activities of participation" (Hemetsberger & Reinhardt, 2006, p. 189). The theory argues that acquisition of objective knowledge is best achieved as the accomplishment of knowing in action through everyday practice in organisational and other social settings (Handley, Clark, Fincham & Sturdy, 2007).

These social cultural practices are built upon the concept of peripheral participation – members gaining skills by working and progressing from basic tasks to full participation (advanced tasks). Novices can progress in a linear and sequential manner as they inculcate themselves in the practice of more experienced 'old-timers'. Peripheral participation acts as a bridge to develop skills, experience and approbation by interacting and learning from peers and mentors, and learning occurs via "centripetal participation in the learning curriculum of the ambient community" (Lave and Wenger, 1991, p.100). Accordingly, this linear and sequential manner of novice to experienced "old timers" aligns with the design of CCS instrument (basic, intermediate, and advanced levels of task statements) e.g., a novice practicing basic level of creative thinking skills can progress to be an experienced "old timer" who will develop an advanced level of creative thinking skills through observations, interactions, and practices in the different situated contexts.

Aims and Objectives

There has been a growing awareness of the importance of CCS to influence individual and organisation performance outcome positively (Heckman & Kautz, 2012). Meanwhile, managers and executives of many companies globally have yet to fully recognise the importance of CCS and the impact of its development on employee performance, and some have misconceptions about CCS itself. The Singapore Talent Shortage Survey (2018) revealed that 65% of employers invest in technical training whilst 54% invest in CCS training, despite studies describing consistent skills gap between Singapore graduates and employers' requirements (Low, Gao, & Ng, 2021; Majid, Zhang, Shen & Raihana, 2012). And until recently, individuals do not view CCS as "must have" skills across occupations. CCS may therefore continue to remain as an awareness campaign exercise that relies on metaphoric assumptions and expectations. Thus, this study aims to address the following research questions to understand more about the CCS use and development in the Singapore context:

RQ1: How important is each CCS to the work to be performed in each occupation group?
RQ2: What is the CCS self-efficacy of Singaporean workers in each occupation group?
RQ3: How do participants typically develop CCS in their different working contexts?
RQ4: How do the participants typically develop CCS in their different working contexts?

Methodology

Phase One: An instrument was developed to measure CCS. Each CCS has a framework consisting of a set of 20 to 30 task statements, and each task statement is assigned to a skill level (basic, intermediate, and advanced). The initial stage of instrument development consisted of coding these statements into dimensions. The combination of these dimensions is intended to capture the essence of the skill as formulated in the framework. Care was taken to ensure that the dimensions were mutually exclusive, relatively specific to the CCS (and not highly relevant to other CCS), and preferably cover more than one proficiency level. This coding was conducted for all 16 CCS frameworks.

For each dimension, a task – or small set of tasks – were then identified that provide instances of the use of the dimension in the context of work, and each task was assigned a skill level by referencing the original framework. Here, the ideal task is understandable by most intended survey respondents, relevant to the dimension that it addresses, and free of standard sources of survey bias. Care was taken to avoid double barrelled statements, acronyms, or industry specific jargon. To gauge the self-efficacy of the respondent in using a skill, the instrument presents the same task items with the question stem: "How confident are you in your ability to…" This is a well-established method to estimate an individual's self-efficacy and is taken from Albert Bandura (2006). Note that the instrument only provides the self-efficacy question if the respondent has indicated that the task was important to their job, to avoid cases where the respondent is unlikely to know or be able to answer due to their not performing the task at work.

The survey questionnaire also included questions on the personal characteristics of the respondent and details about their job. It covered a target population of all employed Singaporean Residents aged 20 to 70. A systematic random sample of private households was selected based on a stratified design by broad dwelling type, with proportional allocation. A total of 490 respondents participated in the pilot study, while a total of 2007 respondents participated in the main study.

An initial cluster analysis was performed by calculating average CCS scores for each 4-digit Singapore Standard Occupation Classification (SSOC) group in the sample. Hierarchical cluster analysis was then performed on the sample of SSOCs using Ward's method with Euclidean distances (Ward's method is the most popular hierarchical clustering algorithm and tends to provide interpretable solutions). The decision to use SSOC group averages for the initial cluster solution, instead of the individual jobs sampled, was to reduce noise in the cluster modelling. A seven-cluster solution accounted for approximately 60% of the variance in the initial SSOC group averages and provided for highly interpretable clusters based on examination of the average skills scores and the SSOC groups distributed across clusters. The initial cluster solution was used to create a logistic regression classification model. This allowed the calculation of the final membership allocation of the full data set of jobs, regardless of their SSOC.

Phase Two: van Laar, Deursen, Dijk, and Hann (2020) expressed that contextual factors such as job quality, complexity of job tasks, nature and degree of support, and the degree of motivation, level of autonomy and self-belief and other value-based factors can be considered for the development of skills. These contextual factors influence the way employees may interact meaningfully with other individuals in their communal settings, which in turn impacts the way they construct shared conceptualisation for the development of skills in their lives and their social world. To unpack these contextual factors in the development of CCS, SLT was adopted to craft the interview questions with a focus on the understanding of how situated events trigger the development of CCS to reach the proficiency levels as required by different job roles. The support and challenges in the process of the development of CCS embedded in various situated events were also explored during the interview.

The interviewees were selected based on the seven occupation groups identified in Phase One, targeting those whose skills are representative of the skills profile of the seven groups. The research team aimed to select five interviewees from each occupation group. However, due to the uneven distribution of participants in different occupation groups and the high decline rate in certain groups, we did not manage to secure an even number across the groups. As a result, some groups have more interviewees than other groups. There are 39 participants recruited for this study. 26 participants are male while the remaining 13 participants are female. The interviewees and their respective job descriptions are listed below:

Occupation Groups	No. of Interviewees	Jobs of the Interviewees
Front-liners	10	Taxi Driver, Admin Assistant, Shipping Agent Executive, Social Service Worker
Administrators	3	Business Development and Marketing, Financial Service Consultant
Deal-makers	4	Technical Executive, Bakers, Account Executives
Nurturers	10	School Teachers, School Support Officer, Senior Executive in IHLs
Managers	3	Centre Supervisor, Social Media Manager, Assistant Admin Manager
Analysers	4	Electrician, Sale Executive for Machinery, Project Officer
Way-finders	5	Hair and Make-up Artist, Auditor, Legal Consultant and Trader

Table 1: Profile of selected interviewees

An inductive approach for thematic analysis of interview data proposed by Braun and Clarke (2006) was adopted. The final product of data analysis is a thematic framework with identified themes and their relationships. Memos were written throughout the research process. Methodological memos were used for discussing and clarifying methodological and organizational issues, while theoretical memos were used in data analysis as the main tool for describing initial codes, themes, and the relationships between themes in the developed framework.

Findings

The cluster analysis solution chosen provided seven groups of workers with relatively unique CCS use profiles.

Front-liners: Frontliners' jobs have a high level of customer engagement, daily work involved in managing unusual requests from customers where communication is a critical part of work. Work demands constant negotiation with tight business processes and regulations. Increasingly, digital applications are part and parcel of work, hence, learning to work with digital tools and apps prompts a need for constant learning.

The group is large but shrinking, representing an estimated 24% of the workforce and growing at an estimated annualised rate of only 0.5% in the last 10 years.[1] It has a relatively low proportion of university graduates (29%) and is also the lowest paid group on average.

The skills profile for Front-liners along with an explanation of the chart is shown in Figure 2, and the common occupations contained in this group are listed in Table 2.

[1] Estimates made using MOM labour force reports 2010, 2020: EMPLOYED RESIDENTS AGED FIFTEEN YEARS AND OVER BY DETAILED OCCUPATION tables

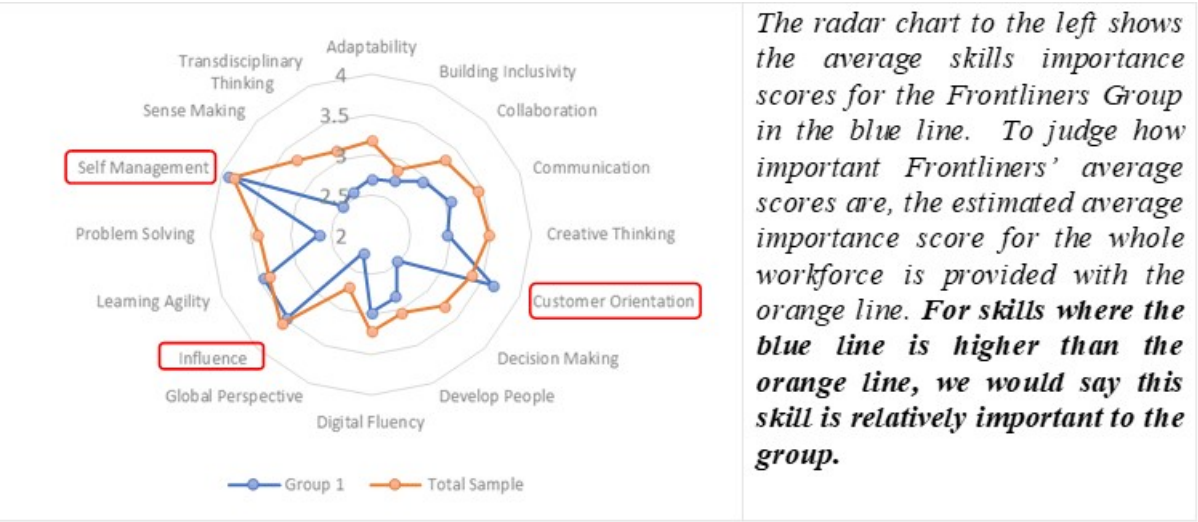


Figure 2: CCS profile for Front-liners

Car, Taxi, Van and Light Goods Vehicle Drivers Receptionists, Customer Service and Information Clerks Food Preparation and Kitchen Assistants Shop and Store Salespersons	General Office Clerks Cleaners in Offices, Commercial and Industrial Establishments Motorcycle Delivery Men Security Guards Commercial and Marketing Sales Executives

Table 2: Common occupations for Front-liners

No skills deficiencies were identified, with no significantly negative average skills efficacy scores across any of the CCSs compared to the rest of the workforce. This is not unexpected, as the CCS requirements for jobs in this group is relatively low.

Administrators: The value proposition that their work revolves around is creating better solutions and improving and enhancing work processes and productivity. Jobs in this group demand orderliness, conscientiousness, and time management. With accountants and systems analysts, systematic critical thinking skills and problem solving are essential CCS for this group.

Administrators are estimated to be a relatively small proportion of the workforce, and that proportion is slowly shrinking. The group is 65% female with a medium to low average monthly salary.

The skills profile for Administrators is shown in Figure 3 and the common occupations contained in this group are listed in Table 3.

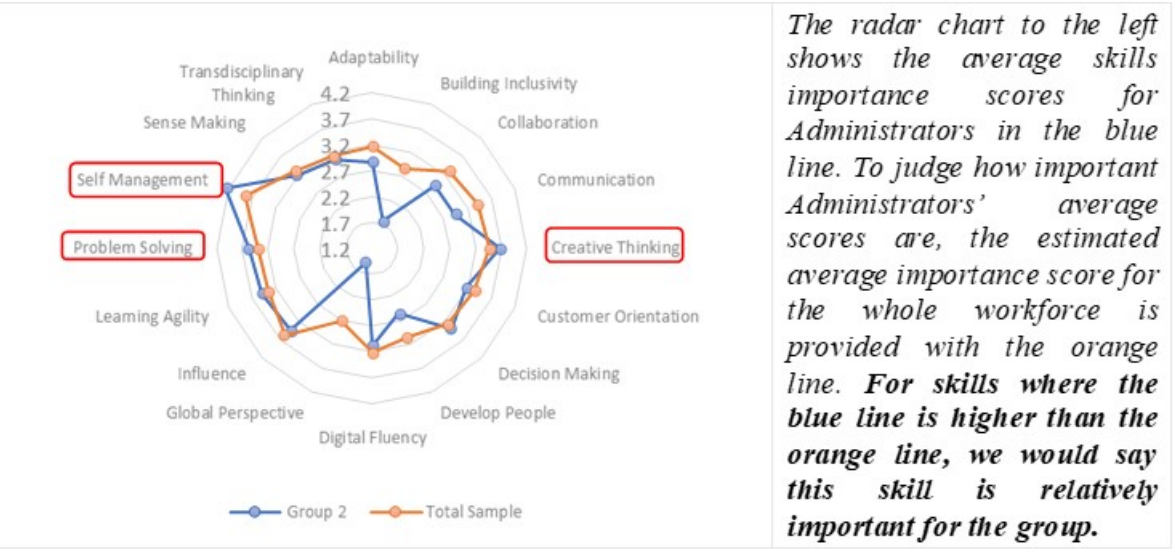


Figure 3: CCS profile for Administrators

Accountants	Supervisors and General Foremen
Accounting Associate Professionals	Advertising and Marketing Professionals
Shop and Store Salespersons	Administration Professionals Not Elsewhere
Software, Web and Multimedia Developers	Classified
Systems Analysts	Primary School Teachers

Table 3: Common occupations for Administrators

The Administrators group, on average, reported relatively low levels of efficacy when performing Self-Management tasks, when compared to the rest of the workforce, and when controlling for skills importance and demographics. This indicates that this group may face challenges in the areas of managing stress, emotions, mental health, and/or physical health.

Deal-makers: Deal-makers' job roles have high CCS requirements. These requirements extend to a wide spectrum of technical skills. There is a need to synthesise information and insights across a variety of sources and contexts. With the need to manage demands from employers and customers, decision-making and problem-solving ability has a significant impact on business outcomes and productivity.

The Deal-makers group is a large, growing proportion of the resident workforce in Singapore representing an estimated 25% of the workforce and growing at an estimated annualised rate of 2% per year since 2012. This profile is relatively young, more likely to be male, and 48% of them are graduates of IHLs.

The skills profile for Deal-makers is shown in Figure 4 and the common occupations contained in this group are listed in Table 4.

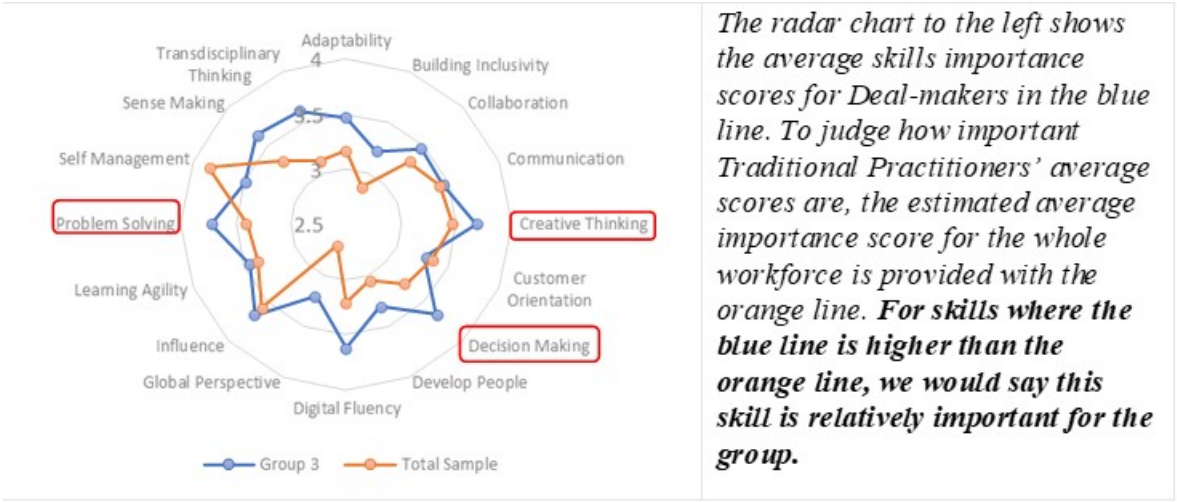


Figure 4: CCS profile for Deal-makers

Commercial and Marketing Sales Executives	Sales, and Business Development Managers
Accountants	Receptionists, Customer Service and
Software, Web and Multimedia Developers	Information Clerks
General Office Clerks	Finance and Administration Managers
Security Guards	Electrical Engineers

Table 4: Common occupations for Deal-makers

Deal-makers reported skills deficiencies in several areas, including:

- Building Inclusivity,
- Digital Fluency,
- Influence, and
- Problem solving**.**

Nurturers: The Nurturers group reflect job roles with a strong component of communication, building inclusivity, and creative thinking. Dominated by teachers, human resource practitioners, and the caring professions such as nurses, this group has a broad variety of CCS requirements including a strong component of interpersonal and emotional labour.

The Nurturers group is a large, growing proportion of the resident workforce in Singapore representing 23% of the workforce and growing at an annualised 1.9% per year since 2012. This group is relatively young and more likely to be female. Developers report a significant number of skills gaps.

The skills profile for Nurturers is shown in Figure 5 and the common occupations contained in this group are listed in Table 5.

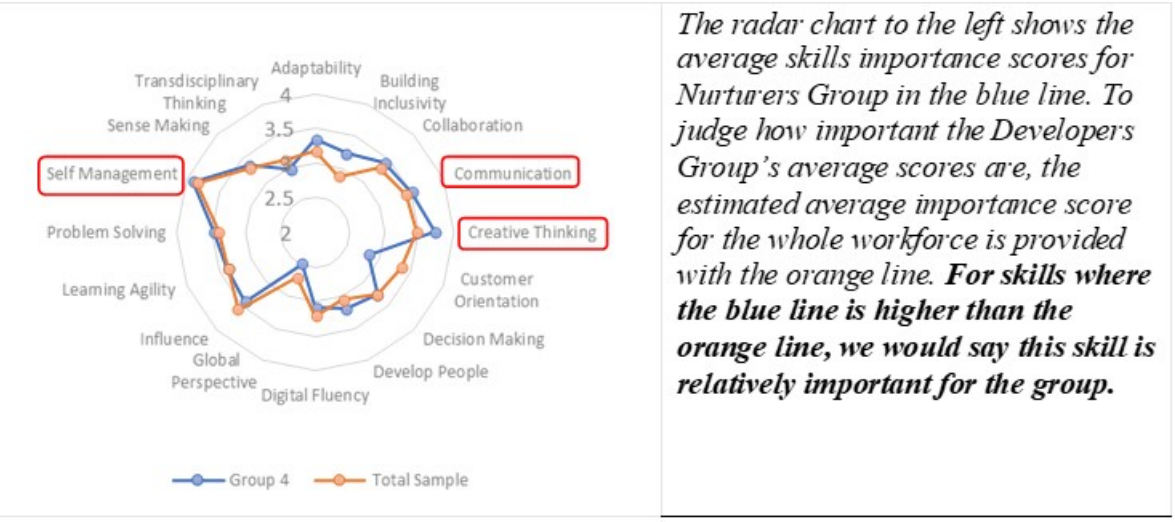


Figure 5: CCS profile for Nurturers

Software, Web and Multimedia Developers	Private Tutors
Accountants	Secondary Education Teachers
Financial Analysts and Related Professionals	University, Polytechnic and Higher Education Teachers
Human Resource Professionals	
General Office Clerks	Primary School Teachers

Table 5: Common occupations for Nurturers

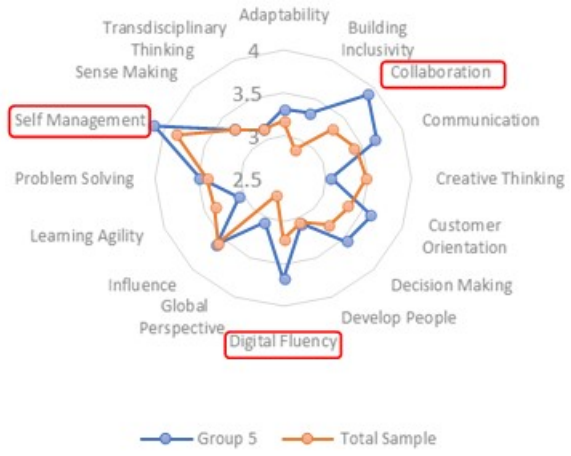
Nurturers reported the largest number of skills deficiencies in the study. These included:

- Adaptability,
- Problem solving
- Building Inclusivity,
- Sense making,
- Communication,
- Creative thinking,
- Develop People, and
- Influence.

Managers: The Managers group tends to work across multiple stakeholders to coordinate delivery of services and solutions. Information processing and collaboration across stakeholders are critical aspects of the work. Use of digital tools and platform is also an essential part of their work.

Managers represent a small but growing proportion of the resident workforce in Singapore, representing only 5% of the workforce and growing at an annualised 1.9% per year since 2012. This profile is relatively young, more likely to be male, and be graduates of IHLs.

The skills profile for Managers is shown in Figure 6 and the common occupations contained in this group are listed in Table 6.



The radar chart to the left shows the average skills importance scores for the Managers Group in the blue line. To judge how important the Managers Group's average scores are, the estimated average importance score for the whole workforce is provided with the orange line. ***For skills where the blue line is higher than the orange line, we would say this skill is relatively important for the group.***

Figure 6: CCS profile for Managers

Sales, and Business Development Managers Supervisors and General Foremen General Office Clerks Managing Directors, Chief Executives and General Managers	Management and Business Consultants Software, Web and Multimedia Developers Healthcare Assistants and Other Personal Care Workers Film, Stage and Related Directors and Producers

Table 6: Common occupations for Managers

Managers reported the following skills deficiencies:

- Adaptability,
- Customer Orientation, and
- Self-management.

Like Administrators, Managers reported low confidence when performing Self-management tasks. Self-management is a CCS that is relatively important to Managers also.

Analysers: Analyser jobs suit the typical knowledge worker in the digital economy. There is a strong requirement for cognitive skills to create value. Their decisions have major impacts on the organisations they work for.

Analysers represent a moderate sized proportion of the resident workforce at 12%. This group, however, is rapidly growing. This profile is relatively young, dominated by graduates and is well paid.

The skills profile for Analysers is shown in Figure 7 and the common occupations contained in this group are listed in Table 7.

Figure 7: CCS profile for Analysers

Financial Analysts and Related Professionals	Advertising and Marketing Professionals
Commercial and Marketing Sales Executives	Accountants
Management and Business Consultants	Buyers and Purchasing Agents
Systems Analysts	Managing Directors, Chief Executives and
Accounting Associate Professionals	General Managers

Table 7: Common occupations for Analysers

No skills deficiencies were identified for the Analysers group, with no significantly negative average skills efficacy scores across any of the CCSs compared to the rest of the workforce.

Way-finders: Way-finder jobs tend to be in general management or sales. These jobs ensure smooth operation of businesses and organisations. Managing customers' and stakeholders' needs is the core of their work, including anticipating needs and issues.

The way-finder group of jobs are a small but rapidly growing proportion of the workforce. Representing 6% of the resident workforce, the profile has grown at an annualised rate of 2.6% compared to 1.6% for the entire resident workforce since 2012. The Negotiator group tends to be relatively senior, highly educated, and has the highest pay of all the CCS skill groups.

The skills profile for Way-finders is shown in Figure 8 and the common occupations contained in this group are listed in Table 8.

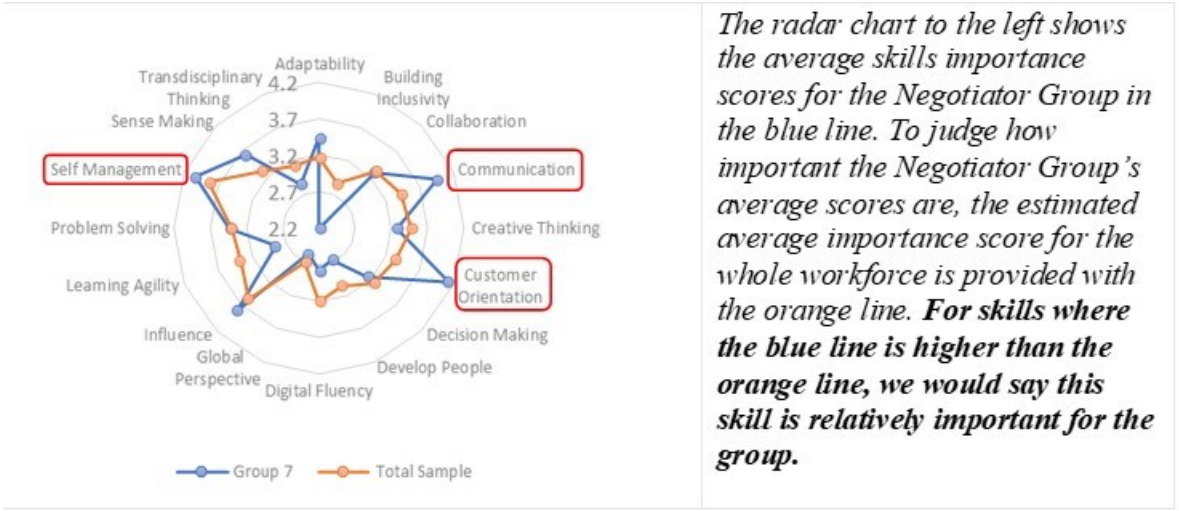


Figure 8: CCS profile for Way-finders

Sales, and Business Development Managers	Accountants
Commercial and Marketing Sales Executives	Financial Analysts and Related Professionals
Financial and Investment Advisers	Management and Business Consultants
Real Estate Agents	Senior Government and Statutory Board
Managing Directors, Chief Executives and	Officials
General Managers	Specialised Goods Sales Professionals

Table 8: Common occupations for Way-finders

The way-finders group, on average, reported relatively low levels of efficacy when performing Creative Thinking tasks, when compared to the rest of the workforce, and when controlling for skills importance and demographics.

CCS Development Pathway

This section will present the findings on how the selected participants in each of the seven groups identified in Phase One of the study, developed their confidence in using the top three most demanded skills in their respective working contexts. Even though the most demanded skills for different occupation groups are not similar due to the different job nature, the development pathways of these different CCS are highly similar. SLT helped us shape the presentation of the development pathway for these selected participants as shown in Figure 9 below. After the visualisation of this pathway, we will use some transcript excerpts to illustrate the pathway. Next, we will select one of the most demanded CCS from some occupation groups to illustrate how they experience such a pathway in their development of different CCS.

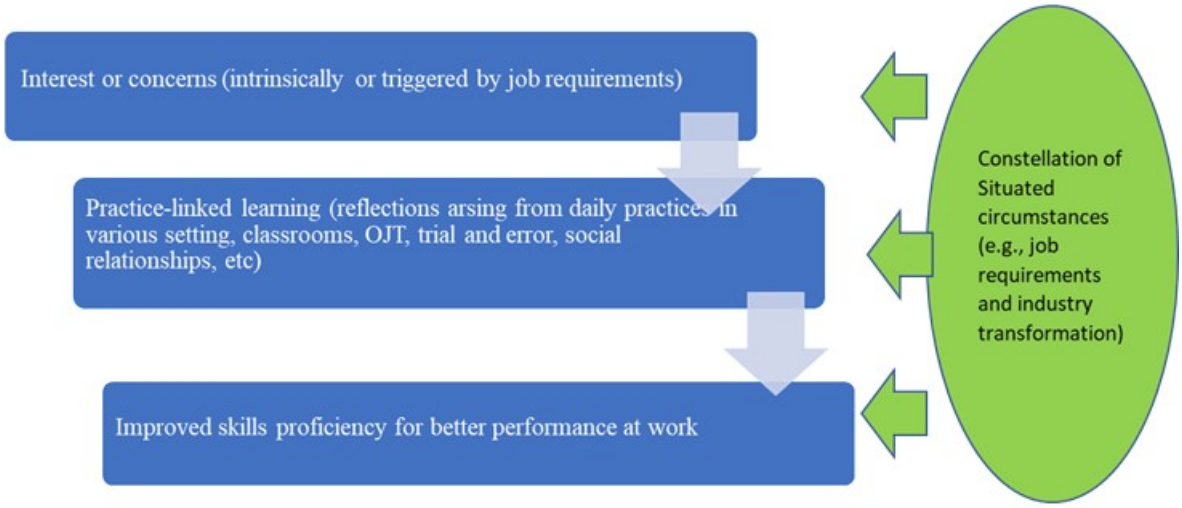


Figure 9. CCS development pathway in the present study

Deal-makers – Decision Making (Use and Development): In this occupation group, one of the most demanded CCS is decision making. Tuk, a technical executive working in a government agency, shared with us that in making decisions at work, he has to refer closely to the 'cardinal rules' and manage projects according to company targets of costs and profits, or municipal regulations:

> *We go for many site meetings, need to make many decision on the spot specifically at the construction site, our job involves many municipal issues and cardinal rules very important to keep a calm mind to make decision that is beneficial to the project like issuing licence to contractors, when issuing licence, notice if there is any residential or commercial property for the licence, we cannot promise the licensee that we can process their application, need to consider all the rules (like noise, dust or other factors) for processing the licence application, timing for the licensee and the residents moving into the construction. (Tuk, Technical Executive)*

In terms of CCS development:

> *As a technical executive, I need to issue licences for contractors to use vacant land of HDB. Use for marriage, use for storage or for other uses. We need to consider municipal issues and regulations on the site and decisions need to be made on site, on the spot. We need to consider, e.g., issue a licence to use vacant land for a contractor. If the land is very near to residential properties, will there be noise pollution, also to take note of residential moving in… so need to gauge the timing of licensee and the surrounding environment…takes lots of practice, usually on the job training. (Tuk, Technical Executive)*

Tuk's daily job involves managing the usage of vacant land. The concern to issue licences for contractors initiated the development pathways for his decision-making skill. He needs to refer to municipal regulations to issue licences for contractors. He works closely with his boss and contractors (members of community of practice) to approve licences. He aims to be well-versed in the regulations as decisions are made usually at the site for recommendation. If he encounters a new situation that he cannot decide, he executes the assignment in a socially coordinated manner (coordinated participation) with his boss. The more situations he encounters (constellation of situated circumstances), the more well versed he gets when

referring to procedures to make decisions. Gradually, he builds his confidence by practising decision-making tasks from basic to advanced level to complete the work well.

Nurturers – Communication (Use and Development): In this occupation group, one of the most demanded CCS is communication. Wario, a Director in Real Estate sales, needs to manage stakeholders' expectations through lots of asking and clarifying of information to achieve the desired outcome, e.g., managing pricing expectation in negotiation. Wario has over 20 years of experience. The concern to negotiate a business deal created his learning pathway for communication skill. He works closely with developers and investors (social relationships) with whom he established a long-standing relationship. Over the years of experience (constellation of situated circumstances), he learns to manage expectation (practice-linked learning) of clients to close deals successfully. He has developed his communication skill from basic to advanced levels to better cater to the needs and requirements of his work.

> *Communication skills usually used for managing negotiation. So negotiation wise, there comes in many forms, right? Some are like, you mean the technique that we taught? Okay, in our mind we look at the documents first, and then process in our mind and see what is fair and what is not fair, and what is market practice and then basically, gauge, try to get more for the owners, okay. If we can't, at least we meet the middle ground, and if we can't meet the middle ground, there are clauses whereby those they can accept, we try to trade off those conditions, so as to make the deal go through. Is that what you're expecting? As in, we try to give and take within those conditions. I think not all conditions will be acceptable by all parties, at least certain conditions will be acceptable, some are not acceptable, so we tend to trade these conditions with the other side, to see which is more acceptable to try to make the deal go through. (Wario, Director)*

Way-finders – Problem Solving (Use and Development): In this occupation group, problem solving is one of the most demanded CCS. Daisy, a hair and make-up artist, has to meet customers' needs and foresee specific problems which may arise for the purpose of completing her projects, e.g., settings in a shoot scene, at the spot of her different workplace settings, in order to progress with the work smoothly.

> *Identifying problems in my job. For sure, because if there is any problem, it will be raised. And it will be my fault, so I cannot let that be? Like I have to identify it first before it becomes a problem, and it delays the entire production. Say for example, if the wardrobe for a particular scene was dictated by the director. Say for example, just a collared shirt. But that scene that they are going to shoot is a scene where he's going to be beaten in the back, and I'm doing a special effects thing. So I have to raise it up to them, say "Maybe you want to choose another wardrobe because the collar will hinder the shooting. (Daisy, Hair and Make-up Artist)*

Daisy has the concern to complete the project, which helps her establish her development route for problem solving skill. She works closely with the scene directors and others at the same place (community of practice) in a socially coordinated manner. The more projects she completes (constellation of situated events) with trial and error (practice- linked learning), the more competent she is to identify and resolve problems at scene. As she works through the levels of problem-solving skills, she grows to become a more professional make-up artist who can foresee and solve any problems that arise before or at the scene.

Performance ah. It's a lot of trial and error so it may work, it may not work. And we have to work with it. My performance at work, I guess like I said, production is a teamwork, so everyone has a part to play lah. And I try to be, I think I am quite a teamwork person, so yeah. We'll work together and like, if they need help, I readily offer to help, even if it is not my department. (Daisy, Make-up Artist)

We observed that most participants have a similar skills development pattern across the diverse contextual settings. The pattern of the three overarching themes (Figure 9) appears to imply that there is a "must have time" space to practise the "executing them in a coordinated manner". Our observation lends evidence to a study by Noe (1986) and Russ-Eft (2002) who expressed that the extent to which trainees have sufficient time and resources available to practise and internalise what they have learnt determines the extent to which the training content will be used or constrained on the job.

In addition, we observed that the social relationships that are peripheral to the job design for the purpose of successful execution of the tasks, influence the degree of motivation to develop CCS. When healthy relationships are fostered within an organization, they fuel the informal sharing amongst the community of practice. These storylines then act as an enabler for the development of CCS. When conflictual and unhealthy relationships exist, they posed as a potential barrier for development of CCS. Similar studies have concluded similar findings as well (Contu & Willmott, 2003; Fox, 2000).

Conclusions and Recommendations

The study concludes that measuring CCS from a formative perspective **(**Ashton, Felstead, Davies & Green, 2000**)**, e.g., job task-based, is an effective way to profile the occupations in terms of importance and self-efficacy in the use of CCS at workplace settings. The profiling results of seven occupation groups from Phase One show clearly that certain occupations share some commonalities in their job requirements for CCS. The development pathway as identified in Phase Two reinforces that concern or interest raised from the job requirements is the main drive for CCS development. The practice-linked learning, e.g., OJT, trial and error, observation of and support from peers or mentors at workplaces, are the main route for their development of CCS. The participants from across the seven occupation groups shared such commonalities in their development pathway.

Therefore, it would be appropriate to recommend that training of CCS be conducted through in-person (but not lecture style) contexts or e-learning portals, to allow the individual the time and space to practise the tasks peripheral to their job design so that they can stay on task or continue to be on-the-job. Such a strategy is advised because of the emerging evidence that skills are work-based concepts (Sung, Ng, Loke & Ramos, 2013). The in-person training could be informal sessions at workplaces to avoid unhealthy competition but be a safe environment to share storylines of development of CCS. Such informal sharing sessions can be spaced over a longer but targeted period to suit the needs of the training objectives. Another approach would be to leverage on e-learning portals that are used by companies for staff's professional development. The CCS learning program could be designed for these e-learning portals through working with training providers, e.g., IAL, to design customised training programmes to suit the operating environment of each organisation. The employees could then work with their respective department heads to pace their learning pathways in a targeted manner to coincide with "must have time" space to practise.

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