

**Finance Disciplinary Task Force
Phase II Report of the MaCuDE project¹**

**Skills Needed for the Finance sector
in the Digital Era**

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MaCuDe Project Phase 2 Finance Report

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1 Introduction

The aim of the second phase of the MaCuDe project is to identify the key skills needed for employees within the finance sector. We sought to identify the impact of the digital age within the sector, how it has changed the way in which employees work to classify the essential skills Schools must develop in students studying finance, and suitably prepare them for careers in the finance sector. Our focus is key skills and digital tools needed for today's roles and roles in the future.

The MaCuDe Finance Task Force, compiled of senior academics from Business Schools across the globe took a two-pronged approach to collecting data.

We compiled a survey to extract an initial overview of the digital tools currently utilised. We wanted to understand the skills currently needed, what digital tools are used and how changes may have happened in workplace collaboration, particularly with reference to the impact the COVID-19 pandemic and how what it has had on working environments. This survey was sent out to alumni, advisory board members and close contacts from the task force. We had 75 respondents from three continents.

Table A: An overview of the survey responses, broken down by professional level and region.

	Asia	Europe	North America	Total
Graduate	1	2	0	3
Postgraduate	0	9	1	10
Professional	4	33	1	38
Manager	0	9	1	10
Senior Manager	1	7	0	8
Executive Manager	0	4	2	6
Total	6	64	5	75

We also undertook a series of focus groups with alumni and industry contacts of different seniorities. Amongst the series of focus groups, we had one which was dedicated to senior leaders from international banks, and another with recent graduates. Here, we could have more in-depth conversations about digital skills and career pathways within the finance sector, focusing on both the current climate and in the future. focus groups consisted of participants mainly large investment banks, finance start-ups and consulting firms.

Survey questions and a sample of the questions used within focus group meetings can be found in the appendix.

2 Digital Skills Impacting the Finance Sector

To understand what digital skills and tools were being used, we asked our survey participants to describe the newest skill they had acquired and whether this was introduced to them by their place of work or that they learnt the skill for their own interests.

Initial Findings from the Survey

Table B: An overview of the areas in which the skills the survey participants had identified as being the newest digital skill they had learned.

	Graduate	Postgraduate	Professional	Manager	Senior Manager	Executive Manager	Total
Algorithmic Trading	0%	0%	2%	0%	0%	0%	1%
Automation	0%	0%	7%	0%	30%	0%	7%
Blockchain	0%	0%	2%	0%	20%	0%	3%
Software Design	0%	0%	2%	0%	10%	17%	3%
Data Analytics	0%	25%	16%	40%	20%	17%	20%
Data Visualisation	0%	8%	11%	10%	0%	0%	8%
Machine Learning	0%	17%	7%	0%	0%	17%	7%
Programming	100%	42%	40%	30%	20%	33%	38%
Project Management	0%	0%	2%	0%	0%	0%	1%
Remote Working	0%	8%	7%	10%	0%	0%	6%
Other	0%	0%	4%	10%	0%	17%	5%

The three most commonly cited digital skills are programming, data analytics and data visualisation.

Table C: Survey responses to the question ‘Was this new skill introduced by your place of work or did you take interest in a new skill for your own personal needs?’

	Graduate	Postgraduate	Professional	Manager	Senior Manager	Executive Manager	Total
Place of work	67%	50%	76%	60%	63%	50%	67%
Personal interest	33%	50%	24%	40%	38%	50%	33%

Two thirds or the survey response indicated their new digital skills were introduced at work, whereas one third sought out new skill for their personal interest.

We also asked survey responders which programming languages they used.

**Table D: Responses to the question ‘What programming languages are used in your company?’
% of programming languages broken down by job level.**

	Graduate	Postgraduate	Professional	Manager	Senior Manager	Executive Manager	Total
Bloomberg	0%	0%	1%	0%	0%	0%	1%
C++	0%	0%	10%	0%	20%	17%	9%
Excel	100%	36%	32%	41%	33%	33%	35%
Foundry	0%	5%	0%	0%	0%	0%	1%
Java	0%	0%	4%	6%	7%	0%	4%
Julia	0%	0%	1%	0%	0%	0%	1%
Matlab	0%	5%	4%	0%	0%	0%	3%
Prophet	0%	0%	1%	0%	0%	0%	1%
Python	0%	27%	31%	24%	20%	25%	27%
R	0%	23%	10%	12%	13%	25%	14%
SAS	0%	0%	0%	6%	7%	0%	1%
SQL	0%	0%	3%	6%	0%	0%	2%
Stata	0%	5%	0%	0%	0%	0%	1%
VBA	0%	0%	3%	6%	0%	0%	2%

From the survey, Excel, Python and R were the most common programming languages used.

Further Insights from the Focus Groups

We asked Focus groups what digital skills are currently impacting the finance sector. Similarly, to the survey, the most commonly mentioned skillsets were in programming, data analysis and data visualisation.

2.1 Programming

The survey showed 38% of overall respondents had identified programming as the latest skill they have acquired. Programming was featured amongst survey responders from all professional levels. All members of groups cited programming as the main digital skill that would benefit graduates when entering the finance sector. From the focus groups consisting of recent graduates, they discussed an ability to use at least one programming language was beneficial in obtaining their first role.

All focus groups agreed the following points. Firstly, a full understanding and advanced skill within programming is sought after for most typical back office and quant roles within banks and larger organisations. Advanced levels of coding are not necessarily sought after in other roles, particularly investment banking or sales and trading positions. However, a familiarity is generally expected so employees can understand the processes involved in analysing data; what is and isn't possible; and the ability to conceptualise the scaling up of processes when discussing and utilising large data sets. It enables employees to work together on projects where there is a full understanding of the limits and restrictions.

Secondly, large organisations have a variety of different structures. Some have specific teams who concentrate on software development and programming for the organisation, others have team structures where one person in the team is an expert in a coding language. Smaller organisations may outsource their programming needs that they may lack in-house, but there is a trend to bring these skills into the business.

Finally, recruiters look for programming ability when recruiting to graduate roles. Often a familiarity with one language is enough, as it demonstrates the ability to understand the process in which data can be manipulated. Some organisations look for specific coding languages depending on the role they are recruiting for.

Key quotations from focus group discussions:

- 'In this day and age, coding is essential.'
- 'I regret not learning *programming* at some point, because when you're super busy with your projects, it's very hard to pick it up.'
- 'The first *digital skill*, I would mention, is just having an extremely good programming background. I don't mean having a computer science degree, but being able to think about how you would design a system, I think that is a skill that is definitely on the top'
- 'When I was interviewing people at Goldman Sachs, I think it's it was probably the number one area we looked for.'
- 'It's more efficient to read data from a database than storing data in Excel files. So if analysts know Python and SQL, it's a major win.'

2.2 Data Analysis

The second most common digital skill demonstrated by the responders to the survey (with 20% overall), is the ability to analyse data. Finance professionals in all roles require skills in mathematics, statistics and make decisions based on their own calculations. The introduction of machine learning and automation has changed the nature of these roles, but the ability to analyse data to make decisions is still very much integral to operations.

Graduates are expected to be able to understand how data can be managed, what processes are possible and conceptualise the scalability of processes.

Finance processes are very complex, there's not a set of machine learning tools already designed that can easily be applied to most processes. Each client or stakeholder may have a different complex set of data and it's up to individuals to be able to know the right tools to be able to analyse it to make decisions.

Key quotations from focus group discussions:

- 'When you have a complex programme that involves multiple funnels, you have to *be an architect*, think about how you design a system.'
- 'You need to know how you would monitor a system, how do you think about scalability, how do you think about computational complexity.'
- 'Most machine learning tools that are ready made are not suitable for applications of finance because of the nature of actual data.'

2.3 Data Visualisation

Focus group members talked ardently about the ability to take complex data analysis and represent it visually. It is necessary for professionals in finance to be able to communicate their analysis in a clear and concise way to inform internal and external stakeholders, particularly senior colleagues or clients.

Tableau is the most popular software mentioned. Focus groups cited the need to think about their intended audience and construct presentations and reports with them in mind. They need to have the skills to be able to extract key learnings from their data analysis and be able to present it visually.

Recent graduates in the focus groups found using Tableau for visualisation was the most important digital skill they are using; a skill they didn't necessarily have much experience in obtaining whilst doing their finance studies.

Key quotations from focus group discussions:

- 'During my internship, the focus was mostly on using Tableau which I never had the experience at university.'
- 'I think what's important is the ability to communicate complex topics simply.'
- 'Try and explain *it* to people who know nothing about finance like maybe parents or grandparents, or like friends and family. I think that's a great way to practice'

3 The Impact of Digital Technology on Specific Roles

The survey we developed extracted information from the responder's career, skillset and experience. Conversations with focus groups allowed us to delve deeper into looking at the impact of digital technology on roles within the sector. We asked what roles may have been impacted by digital skills, whether traditional roles were disappearing and what new roles may be emerging as a result.

3.1 Existing Roles

Traditional finance roles, for example within investment banking, sales and trading still exist. The consensus from focus groups is these areas of banking will continue to exist in the future, but the nature of individual roles has changed over time and will continue to do so as technology and automation develops.

The use of electronic trading was cited as the one area in which machine learning has had the most impact. Banks have improved the speed in which traders can design and execute trading strategies which has impacted operations and the number of trading roles that are available. These traditional desk roles have seen a decrease in recent years.

In contrast, there has been further need for quant roles and software development as digital technology has impacted traditional processes.

Key quotations from focus group discussions:

- 'We're seeing less and less traders. These people are becoming scarce, mainly because of algorithmic trading.'
- 'A lot of the things that we need to know, like tools that are needed to understand and price products and financial markets already exist, at least in big investment banks.'

3.2 Automation

Like most sectors, the finance industry has seen an increase in automated processes. Algorithmic Trading has been responsible for replacing manual processes traditionally used by traders.

33% of the survey responders suggested their companies used artificial intelligence to inform decisions. However, the majority of the focus groups agreed that most decisions are still made by humans. As finance processes are complex; there are many factors to consider when making decisions. For example the need to measure a variety of risk factors, changing regulation or the impact of ESG implies that machines are not yet equipped, and processes are not simple enough for only artificial intelligence decision making.

There was a consensus amongst focus groups that larger organisations, particularly banks, cannot automate all their processes as they're unaware of the many processes they use. The automation movement is slow progress.

Key quotations from focus group discussions:

- 'So the main impediment to why we can't turn off everyone's job and replace it with robots tomorrow is the fact that most organisations I've worked with in the past have really complex, overly complex processes, or they don't even understand the process.'
- '*Automated processes are developed and then there's* tweaking because there are many inclusions, exclusions and special cases where the computer does not yet have the power to make those decisions. It definitely still needs someone to run it.'
- 'Regulation on the sell side; I don't see it being 100% automated.'

3.3 New Roles

Regulation

The finance sector is heavily regulated to ensure stability. Regulation authorities by governments or NGO's need to be adhered to. There's been an increase in roles concerning regulation over the past decade as banks are investing in this area. Artificial intelligence and machine learning tools can be used to automate processes to minimize risk and errors in organisation practice. As regulation advances, there's a need to alter and develop processes accordingly.

Environmental, Social, and Governance (ESG) Investing

The Finance Industry is progressively monitoring the impact of ESG in their operations. Criteria concerning the environment, relationships and leadership is becoming a widespread way to evaluate companies and their investments. A swing to socially conscious investing is increasing. Roles dedicated to ESG and measuring the risk of a company or investment due to their practices have become popular in recent years.

Key quotations from focus group discussions:

- 'For graduate roles, one that is definitely in increasing demand is all about ESG and climate risk.'

Decentralised Finance (DeFi) and Cryptocurrencies

Decentralised Finance (DeFi) has almost become its own sector with more jobs increasing within this field. Blockchain technology has led to a change in financial infrastructure which is shaking up the finance sector. DeFi allows operations on an individual level without the need for a financial intermediary. The rapid expansion of DeFi sector means that current regulation and laws have not been able to keep up with the development and risks are higher. As the world adapts to DeFi, cryptocurrencies and crypto assets, roles within this space will likely increase.

Key quotations from focus group discussions:

- We are now seeing mainstream adoption towards digital assets (central bank digital currencies, retail bank endorsed initiatives, regulation towards decentralised financial (DeFi) applications) increasing at breakneck speeds, however education towards its adoption and understanding is still years behind. The foundations for a new financial system are being created today and understanding the technology that underpins this will be essential for future finance graduates to thrive in tomorrow's world.

4 Career Pathways

Within the focus group discussions, we also posed the question of how a graduate may be promoted in the finance sector, whether there is an emphasis on digital skills and whether career pathways have changed in recent years. Participants discussed their experiences with both the traditional ascending pathway; where an employee rises up the ranks within an organisation and a linear pathway; where an employee may decide on a change in career due to skills they have acquired.

4.1 Ascending Pathways

Careers still have traditional ascending pathways within an organisation. Analysts are still able to move to managerial and director roles as their career progresses.

Skillset is important to ascend; both digital skills and soft skills were discussed as factors for promotion. Focus groups discussed age or experience may not be a consideration when promotion occurs due to digital capabilities. There were examples of junior employees being promoted to leadership roles or newly developed roles due to their skills in programming or data analytics. Whereas, leadership and soft skills, or the ability to navigate the politics of the organisation may take more time to develop. Those with digital skills are seen as assets, as quite commonly these skills are not found in senior levels of the organisations.

Key quotations from focus group discussions:

- 'There is a need for politics in order to ascend, let's say, within a larger organisation. But politics may sound like an overloaded word. For example, being kind and collaborating with others can get you a lot far ahead.'
- 'The ones who are promoted primarily are the digital leaders, people who are very capable and adaptable, applying computational skills.'
- 'When we join, we show all of these technical skills and managers get quite impressed because they are from a different generation.'

4.2 Linear Pathways

Focus groups also agreed that they've seen an increase in linear pathways or career changes in recent years. Analysts may decide to move from banking roles to those within financial technology and DeFi. For example, a quant can develop the skillset to become a software developer. There has been movement from investment banks to start ups. Employees are considering the benefits of a work life balance and flexibility of working hours when seeking new opportunities.

Key quotations from focus group discussions:

- 'We're seeing drain away from traditional banks to non-traditional banks, either fintech start-ups or people that want to go into decentralised finance'
- 'It's interesting the way that we see the movement of people laterally into different organisations'
- 'Some people don't mind having a side job on top of the day job. Suddenly they find that actually I want to be a software developer somewhere else and off they go.'

4.3 Immigration

Sponsorship of immigration visas can influence decisions as to where graduates head after they complete their programmes. Large banks and other top companies find it easier to sponsor visas due to their scale and the resources at their disposal. Employees may then choose to deviate from the traditional banking career once their sponsorship period is over.

5 Changes to the Workplace

In order to understand the workplace within the finance sector, specifically how teams collaborate, communicate and whether there had been significant impact since the COVID-19 pandemic forced global remote working; in the survey we asked how workplace collaboration has increased or decreased in recent years. The majority of responders believed collaboration had increased. More interaction occurs not only within teams who are not located together, but responders described more interaction across the organisation as technology has enabled them to do so.

Table E: Has collaboration among team members who are distributed increased or decreased in recent years?

	Graduate	Postgraduate	Professional	Manager	Senior Manager	Executive Manager	Total
Increased	33%	60%	55%	40%	63%	67%	55%
Decreased	33%	10%	13%	20%	13%	0%	13%
Not applicable	33%	30%	32%	40%	25%	33%	32%

Comments from the Survey:

- Easier to connect with other teams in companies because of online meetings and lack of need to meet in person.
- Location now has little impact. Remote working has lifted barriers.
- New technologies and tools have improved and facilitated remote collaboration.

Table F: Are new technologies being used because of COVID-19?

	Graduate	Postgraduate	Professional	Manager	Senior Manager	Executive Manager	Total
Yes	0%	70%	61%	50%	50%	83%	59%
No	0%	10%	26%	20%	13%	0%	19%
Blank	100%	20%	13%	30%	38%	17%	23%

5.1 The Impact of COVID-19 on collaboration during lockdowns

At the focus groups we discussed in more depth how the world was impacted by the ways teams needed to collaborate during the COVID-19 lockdowns. Participants discussed how the integration of software to facilitate meetings and communication was introduced and utilised. Zoom, Microsoft Teams and Google Meets were the most commonly used tools for meetings and collaborating with stakeholders, internally, locally and globally. Many organisations already employed virtual private networks to protect the sharing of data and processes remotely.

5.2 Utilisation of Technology following COVID-19 lockdowns

Focus groups participants discussed a variety of different workplace expectations following the utilisation of digital technology. Some described how remote working enabled flexibility with working hours, commuting, travel and the ability to pick your preferred method of working. Others described how their organisations wanted employees to return to office-based working as the benefits of working amongst a team on productivity and mental health were beneficial to operations.

Communication was the biggest hinderance of remote working. Group members described being left out of key communications, strategic discussions or team integration. It was noted that processes such as on-boarding new staff left new employees feeling isolated. Teams had to think carefully about the way they communicated to ensure inclusivity and many collaborations were felt not to be as beneficial as a in-person meeting or workshop.

Business travel, at the point of conducting the focus groups had not yet recommenced at the level it was prior to the pandemic. Focus groups felt there was still a place for travel globally especially when collaborating on projects. However, the savings of not travelling and conducting meetings and conferences via zoom will not doubt reduce the need for business travel and could have a significant impact to the spending within smaller organisations.

Key quotations from focus group discussions:

- 'It was smoother the way we worked before. You're not on each other's back all the time, so you have a little bit less pressure, and you can organize better things in your own way. *In the pandemic* there was quite a lot of micromanagement, a lot of meetings.'
- 'People will be coming back to the office'

6 Emerging Business Skills

To understand what other business skills were necessary for careers within the finance sector; in our survey we focused specifically on soft skills or leadership skills, and which were vital for career development. Whereas, in the focus groups, we asked more broadly whether there were any emerging skills they could identify that were necessary for future careers. We asked if companies invested in their own training and development, or whether employees learned on the job.

Table G: What leadership skills do you feel are needed for career advancement?

	Postgraduate	Professional	Manager	Senior Manager	Executive Manager	Total
Accountability	6%	8%	0%	17%	0%	7%
Adaptability	0%	3%	14%	0%	0%	3%
Communication Skills	19%	13%	14%	0%	29%	14%
Creative Thinking	6%	0%	0%	0%	0%	1%
Delegation	0%	5%	0%	0%	14%	4%
Emotional Intelligence	0%	10%	29%	0%	14%	9%
Influencing	0%	3%	14%	0%	0%	3%
Initiative	0%	5%	0%	0%	0%	3%
Motivation	13%	3%	0%	17%	0%	5%
Negotiating	6%	0%	0%	33%	0%	4%
Networking	13%	3%	0%	0%	0%	4%
Presentation Skills	6%	3%	0%	0%	14%	4%
Problem Solving	0%	5%	0%	0%	0%	3%
Project Management	6%	5%	0%	17%	14%	7%
Remote Working	0%	0%	0%	0%	14%	1%
Strategic Oversight	6%	3%	29%	0%	0%	5%
Teamwork	19%	25%	0%	17%	0%	18%
Time Management	0%	8%	0%	0%	0%	4%
Training Colleagues	0%	3%	0%	0%	0%	1%

Good communication and the ability to work in teams were the most frequently mentioned soft skills necessary for career enhancement. The need for good accountability and high emotional intelligence were also seen as important.

6.1 Training

Focus groups participants explained most new hires learn by action, shadowing existing employees or being trained by team members. Many discussed the need to learn on the job and rarely attended any in-house training or education sessions.

Learning by doing was common practice as many processes were bespoke to teams and not necessarily organisation wide. Those in focus groups suggested they often needed to learn new software or digital tool packages to analyse data when moving organisation to fit in with the operations of the team. Those in client facing roles also described the need to adapt their methods to the specifications of their clients. The skill of being flexible and adaptable to processes is fundamental.

6.2 Communication and Presentation Skills

The ability to communicate effectively is seen as the top soft skill needed by all levels in the survey and focus group. Executive managers particularly value good communication skills; the need to be concise and effective in both verbal and written communications; explaining complex topics in a simple easy-to-

understand way. They also value the ability to communicate effectively to clients, stakeholders and to all levels of seniority. An individual who possesses digital skills and can effectively communicate is seen as an asset.

Key quotations from focus group discussions:

- 'Presentation skills are important. Being able to speak in public, with a lot of stakeholders, not being shy with colleagues that are in higher positions'
- *Graduates need to know how to communicate more effectively, how to articulate their thoughts, their ideas'*

6.3 Teamwork

Working as part of or leading an effective team is also considered essential. Teamwork has consistently played a crucial role in the productivity of a department. Strong managers are seen to be assets, the ability to develop team members and support them with achieving their career goals.

Key quotations from focus group discussions:

- 'Teamwork is crucial, but I guess more leaderships skills, you need to be able to manage and resolve potential conflict of interest across different teams'
- 'Take ownership and accountability for your work. Be proactive to discover problems and work with team to find solutions.'

6.4 Adaptability

Adaptability was discussed consistently amongst focus group participants. With digital technologies advancing, the ability to upskill, learn new tools to improve the efficiency of their work is needed. Advancing within an organisation, individuals must find ways in which they can add value. As technologies advance, there's a worry their skillset may not be relevant in future years. Adaptability enables individuals to cope with organizational change at different paces.

Key quotations from focus group discussions:

- 'Employees need a willingness and motivation to develop and learn new skills, good work ethics and integrity.'

6.5 Problem Solving and Strategic Oversight

The ability to understand the overall strategy and bigger picture is needed when solving problems and finding solutions to complex issues. Coupling this skill with the understanding of digital skills like programming and data analysis creates a strong employee.

Key quotations from focus group discussions:

- As part of your data analysis, you need to be able to problem solve. It's important, it's really key.

6.6 Further Education

Knowledge is seen as a way to advance careers. Continuing further development and education is the preferred route for many to gain further skills. Organisations may embed or reserve time in a calendar year for individuals to take a course of their choosing. Some may take time out to further study or undertake research into their chosen field within finance.

7 Ethics and Privacy Issues

To understand the extent in which ethics plays a part in roles within the finance sector, we asked survey responders whether ethics or privacy matters impacted their work. We were able to delve deeper into this area with focus groups.

Table H: Have Ethics of Privacy Matters impacted your companies work?

	Graduate	Postgraduate	Professional	Manager	Senior Manager	Executive Manager	Total
Yes	0%	40%	37%	30%	38%	17%	33%
No	33%	50%	63%	60%	50%	83%	60%
Unsure	67%	10%	0%	10%	13%	0%	7%

From the survey only 33% stated that ethics impacts their companies work.

When asked about privacy issues, many focus group participants considered ethics to be a concern at a wider institutional level as opposed to within their day-to-day job. Much is informed by organisational policy and built into an organisation's infrastructure; therefore, decisions have been made already.

On a team level, ethical decisions are a consideration when handling data, particularly customer or client data when creating new processes. The use of data is often discussed, what data can/can't be used and what processes are in line with regulation. Senior members of the focus groups mentioned that younger generations had more ethical and moral concerns and would enforce this onto their operations.

Key quotations from focus group discussions:

- 'I think it's applicable to our salespeople, who would find a *university* ethics course more useful than others because they are really client facing'
- 'When working for a large retail bank, we use a lot of data per customer so there's always ethics of how you far you can use that'
- 'A huge implication for ethics going forward with the increasing use of technology, you have access to a lot more information but actually there's some information that you could potentially use that is statistically significant but it could potentially create biases within your models'

7.1 Privacy and Cybersecurity

Cybersecurity is a concern due to the nature of the data within the sector. Employees and new starters are given training programmes on email phishing and scams to avoid data leaks. Reminders are provided so it's always in their consciousness when receiving requests for information. Most of the larger organisations have robust processes and ways of working to ensure data is kept internally. For example, employees wouldn't be able to operate remotely without using their VPN's or other privacy networks. Employees largely don't think about it as processes are very robust.

Key quotations from focus group discussions:

- 'We are prepped from day one, we have a lot of training. We have a lot of the classic phishing emails and so on, but we also have weekly emails so you know potential threats and how to protect yourself.'
- 'The pandemic was a big driver *to increase cybersecurity* because everything was remote.'

8 Skills Needed for Early Career Graduates

Within the survey we asked specifically what skills Business Schools could teach to prepare graduates for roles within the finance sector. We also proposed this question to the focus groups and went into further discussion about the ways in which skill development can be embedded within the curriculum.

Table I: What skills could business schools assist in preparing our students for the workforce? Responders commented on the following digital skills.

Data Analytics	12%
Ethics, Data Protection and Governance	2%
General Digital Skills	8%
Machine Learning	2%
Programming	24%

Survey comments:

'Development of strategic overview skills.'

'Maybe more topics on big data, machine learning, extracting information from data'

'Technical skills are most important for recent graduates. Working in teams is also important.'

'All graduates should be able to code, or at least have an understanding of coding'.

Table J: What skills could business schools assist in preparing our students for the workforce? % Responders commented on the following soft skills.

Communication Skills	8%
Creative Thinking	2%
Emotional Intelligence	4%
Influencing	2%
Negotiating	2%
Presentation Skills	12%
Problem Solving	2%
Project Management	2%
Resilience	4%
Strategic Oversight	6%
Teamwork	10%

Similarly, to the digital skills highlighted previously, the survey highlighted programming and data analytics as the important digital skills for graduates as they begin their careers.

Soft skills were also prevalent, especially presentation skills, the ability to work as a team and good communication.

Some further comments within this section on the survey included:

- 'It's time that the Business Schools stress more on developing listening skills rather than speaking skills. They should also teach students to be brief and to the point.'
- 'Enhance their self-esteem and ability to identify when to insist on something and when to step back'
- 'More behavioural finance, more philosophy. Too much focus on making students calculators.'
- 'An ethics course shouldn't be only about complying with regulations, but how to survive and foster collaborative and respectful environments. Finance programs could take a hint or two from the tech culture.'
- 'In the working world, it's impossible to get everything done on your own - you need to rely on a team hence teamwork is essential especially when working towards tight deadlines.'
- 'Cultivate a culture of continuous knowledge seeking'

From the survey, 56% of responders mentioned their company was training new hires on general skills they require. 44% expect new hires to arrive with the skillset.

8.1 Curricular Impact of New Skill Requirements

These key skills were very much echoed when we posed the same question to our focus groups. Graduates need to be developed as 'all-rounders'. The ability of utilising specific digital skills isn't enough in the finance sector today. They need to harmonise these with a strong set of soft skills. For example, the ability to analyse data and then present it to multiple stakeholders complement each other.

At the focus groups, we were able to delve deeper into this question by asking what they would expect from a Finance curriculum to support the development of these key skills.

8.2 Applied Learning

The focus groups appreciated that a curriculum grounded in theory is important. Students still require a strong statistical and theoretical foundation in finance and to be able to apply these concepts when embarking in their careers. Being able to use real life case studies and situations is important as students would have then had relevant experience when commencing internships or full-time positions across the sector; they need to gain an understanding of what the sector is like to be successful from the start.

Key quotations from focus group discussions:

- 'Confront students to real life situations of a company, with multiple variables (time, budget, market crash, Human Resources) and different scenarios'
- 'Blend of theory and practical applications incorporated into the syllabus.'
- 'Business schools should try to emulate real-life situations as much as possible in order to teach and prepare the students. Role playing and guest lecturers are two ways this can be done very effectively.'
- 'Simulate their working weeks for them. Super helpful and gets less overwhelming on their first day at work'

8.3 Critical Thinking

The ability to analyse and solve problems, especially when utilising digital skills is crucial. For example, strong skills in a programming language is a great a tool, but an understanding of how it can be used, the limits and influences when analysing data and how codes can be scaled up is considered an advantage. Students need to learn how to undertake operational tasks but also the bigger picture of where and why specific tasks are utilised.

Key quotations from focus group discussions:

- 'Development of strategic overview skills by understanding the fundamental aspects of the material taught.'

8.4 Soft Skills

Opportunities to work as a team, improve communication skills, present ideas and reflect on these are important. An awareness to what they've done well and ways in which they can improve is essential. Graduates from focus groups often commented on their ability to develop softer skills were not present within the curriculums. Working in teams seemed to be common but presenting ideas or concepts to a variety of audiences, large and small, was limited whilst studying.

Key quotations from focus group discussions:

- 'I think a lot of people get to practice presenting, being really succinct in the way they speak'
- 'Practice storytelling. How do I make it, short and sweet but get the point across and tell the story to the client through the slides without boring them.'
- 'Perhaps presenting seminars can be introduced, presenting for seven minutes in front of the whole class of 80 people.'
- 'You just don't really think about the person you're presenting to because you're so nervous about yourself. It's important to think about the audience'

9 Key Findings

We have summarised the key findings of this report into the following statements:

1. An understanding of programming languages plus the ability to analyse and present data are the top digital skills currently in demand within the finance sector.
2. There's a move towards automation of processes by machine learning. Finance processes are extremely complex and human decision making is still needed as it's not easy to create automated processes that fit all.
3. The sector has seen an increase in roles within regulation and or with a focus on environmental, social and governance (ESG).
4. Decentralised Finance is changing the landscape of the finance sector.
5. Soft skills, particularly communication, presenting and teamwork are still very much in demand.
6. The need to be flexible, adaptable, and willing to learn new skills (upskill) are essential for career progression.
7. Graduates need to be problems solvers, have strategic oversight, and understand how their operations fit into the bigger picture.
8. Curriculums need to embed applied and simulated content to give graduates a realistic understanding of the workplace.

10 Appendix

10.1 Survey Questions

1. What do you consider is the newest digital skill you have learned?
2. Was this new skill introduced by your place of work or did you take interest in a new skill for your own personal needs?
3. Do you feel your workplace collaboration has changed in the recent years due to the increased use of technology? Please briefly explain how?
4. When you hear about new technological advances do you get excited and want to know more or do you wait until there is a need to learn more?
5. Have ethical issues and privacy matters impacted your companies work?
6. What training/skill prerequisites have been introduced for your company's new hires?
7. Are any new prerequisites the result of COVID-19?
8. Has collaboration among team members who are co-located increased or decreased in recent years? If it has increased, please specify how?
9. Has collaboration among team members who are distributed increased or decreased in recent years? If it has increased, please specify how?
10. Are new technologies being used because of COVID-19?
11. What leadership skills do you feel are needed for career advancement?
12. What skills could business schools assist in preparing our students for the workforce?
13. What digital skills are needed for your new hires?
14. Are you training existing employees on these new skills?
15. What programming languages are being used across your company?
16. Is your company relying on machines to incrementally make decisions, or to inform your decisions?

10.2 Examples of questions asked at Focus Groups

1. Which digital technologies are currently impacting the Finance Sector?
2. How are existing roles in Finance changing?
3. Are there any new roles emerging within this digital age? What roles are disappearing?
4. How are career pathways changing?
5. How does your organisation develop new employees?
6. How is the workplace changing?
7. Has there been any significant changes due to the pandemic?
8. How are decisions being made by artificial intelligence, or by humans?
9. What new business skills does the sector need?
10. How does an employee get promoted? What skills do they need to rise up in the sector?
11. How do teams collaborate? Is this changing?
12. What skills do you see being valued in the future?
13. What key ethical issues are being addressed within Finance?
How can new graduates prepare for these?
14. What skills should Business Schools help develop in graduates?
15. How can these be integrated into a curriculum?