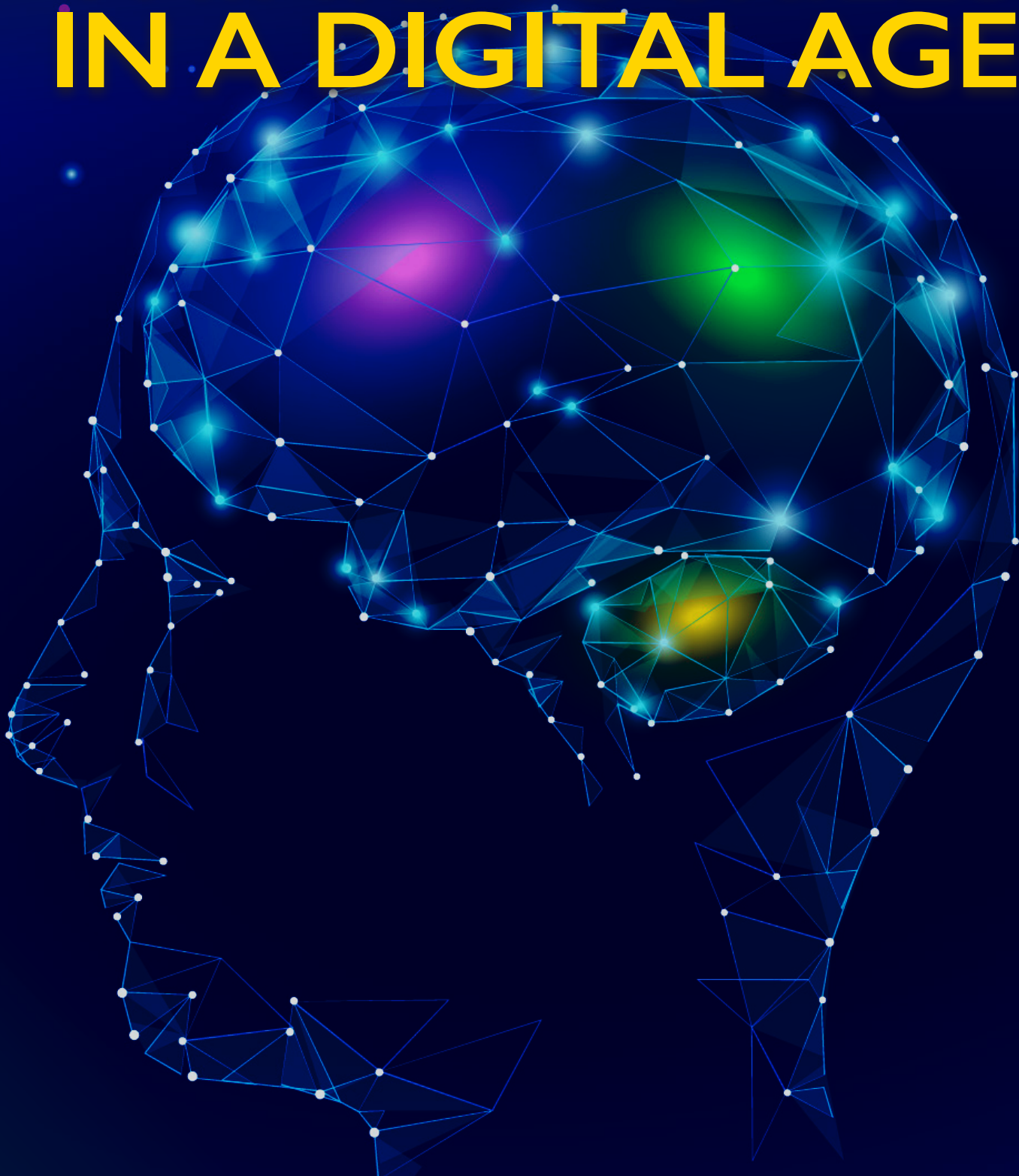


SPECIAL REPORT 2024
THINKING SKILLS
IN A DIGITAL AGE

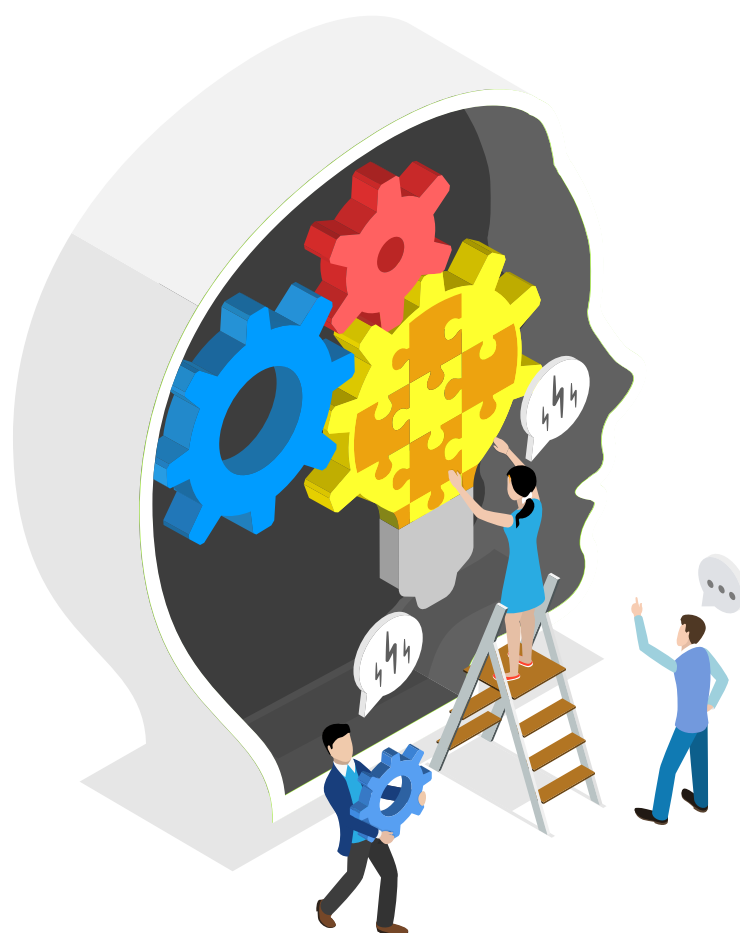


Shifting consumer expectations and technological innovations are encouraging organisations to embrace automation and digitalisation to remain competitive¹. Today, human skills have become more essential than ever as they cannot be replicated easily by automation. Particularly, critical thinking skills allow individuals to analyse issues, ideas, and reason from multiple perspectives².

This is especially crucial in an environment abundant with data, information, and opinions as it empowers individuals to discern valuable insights and fact from fiction³, thereby allowing them to make well-informed decisions. Besides digital literacy, critical thinking also drives creativity and problem-solving, enabling individuals to produce original and meaningful content in addition to developing innovative solutions even when technology is unable to do so⁴.

Therefore, it is not surprising that employers in Singapore are intent on hiring candidates with communication, problem-solving and strategic thinking skills⁵. In fact, critical thinking has evolved into a vital transferable skill applicable across all job functions and industries⁶. Critical thinking is not merely an additional skill to technical skills, but rather serves as the foundation to successfully navigate an increasingly digital world.

In this report, we investigate the role of thinking skills in complementing technical skills to build a resilient workforce capable of navigating the complexities of the emerging digital economy. Our report also explores the transferability of thinking skills across industries and roles, underscoring the need for training to enhance workers' adaptability and career prospects.



1 The Straits Times. 2023. [Ready and resilient: Report identifies top skill sets you need to thrive in the future](#).

2 SkillsFuture Singapore. 2023. [SKILLS DEMAND FOR THE FUTURE ECONOMY 2023/24](#).

3 Medium. 2023. [The Role of Critical Thinking in Digital Literacy](#).

4 Deloitte. 2020. [Future Skills: Keeping the workforce human](#).

5 The Straits Times. 2021. [S'pore employers prioritise skills over education, experience: LinkedIn survey](#).

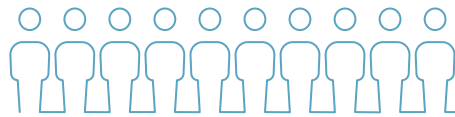
6 SkillsFuture Singapore. N.d. [Critical Core Skills - What They Are And Why They Matter](#).

Empowering the Digital Economy with Thinking Skills

Technological innovations are driving digital transformation today. Artificial Intelligence (AI) in particular, has been gaining widespread attention and is set to reshape the future of work, with its potential to boost productivity⁷.

Although AI is increasingly integrated into business operations⁸, it still often relies on established patterns of information. This also raises concerns about the susceptibility of large volumes of data to cyberthreats⁹. Since AI cannot replicate the nuanced understanding and flexibility of human thinking¹⁰, many leaders view soft skills as more important than AI skills¹¹, prompting businesses to prioritise developing the critical thinking competencies of their workforce¹².

Consequently, nearly all business leaders (54% very important, 45% somewhat important) surveyed perceive thinking skills as important for employees to adapt and meet changing workplace demands, such as those arising from greater AI adoption and increased cybersecurity threats. As such, more than three in four business leaders (13% strongly agree, 64% somewhat agree) agree that their workforce is equipped with the thinking skills needed to handle AI-driven changes.



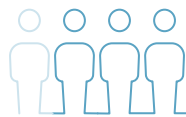
Nearly all business leaders perceive **thinking skills as important** for employees **to adapt and meet changing workplace demands**, such as those arising from greater AI adoption and increased cybersecurity threats.

54%

Very important

45%

Somewhat important



More than 3 in 4 business leaders agree that their **workforce is equipped with the thinking skills** needed to handle AI-driven changes.

13%

Strongly agree

64%

Somewhat agree

7 Forbes. 2023. [How AI Is Changing The Future Of Work](#)

8 CNBC. 2023. [Here are the top skills you will need for an 'A.I.-powered future,' according to new Microsoft data](#)

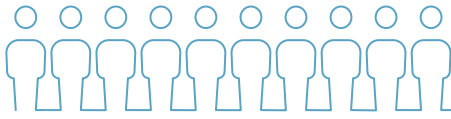
9 Forbes. 2024. [The Future Of Cybersecurity Is More Human Than You Think](#)

10 Forbes. 2024. [In The Age Of AI, Critical Thinking Is More Needed Than Ever](#)

11 The Straits Times. 2024. [When your technical skills are eclipsed, your soft skills will matter more than ever](#)

12 Deloitte. 2019. [Critical thinking rivals technical skills for Industry 4.0 success](#)

Moreover, nearly all business leaders (47% very important, 49% somewhat important) view thinking skills as important for augmenting or supplementing employees' technical skills in the face of emerging technologies like AI, with the majority (41% strongly agree, 57% somewhat agree) concurring that thinking skills help employees to stay relevant and employable as technology advances, as opposed to being replaced.



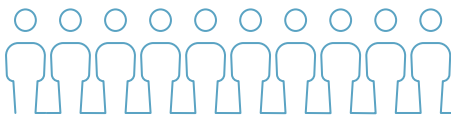
Nearly all business leaders view **thinking skills as important for augmenting or supplementing employees' technical skills** in the face of emerging technologies like AI.

47%

Very important

49%

Somewhat important



Nearly all business leaders agree that **thinking skills help employees stay relevant and employable** as technology advances, rather than being replaced.

41%

Strongly agree

57%

Somewhat agree



“

Strong thinking skills are essential for employees to navigate technological advancements. Critical thinking enables well-informed decisions, systems thinking reveals the interconnected nature of business functions, and creative thinking drives innovation by integrating new technologies into operations. For example, applying these skills in operations can identify inefficiencies and automate solutions, saving time and resources. Transferable across roles, these skills foster adaptability, efficiency, and resilience, empowering employees to thrive amid change,” says Tham Chien Ping, Representative and Master Facilitator, South-East Asia, Society for Human Resource Management (SHRM).

Unlocking Human Potential with Thinking Skills

As sophisticated technologies create new high-quality jobs, the demand for a good mix of technical and critical core skills grows¹³. A comprehensive skill set hence equips individuals to effectively harness technologies and drive transformation¹⁴. For instance, insights gained from human-led fact-checking and source analysis improve the quality of AI systems and steer them to deliver the right outcomes for specific use cases¹⁵, thereby allowing employees to add value to the workplace.

Nearly all business leaders (44% strongly agree, 52% somewhat agree) agree that combining thinking skills with technical skills enables employees to take on higher-value roles in a technology-driven world.

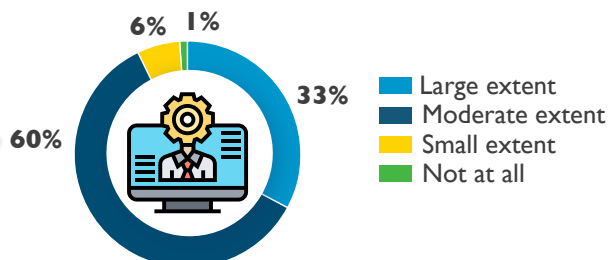


Nearly all business leaders agree that **combining thinking skills with technical skills** enables employees to **take on higher-value roles** in a technology-driven world.

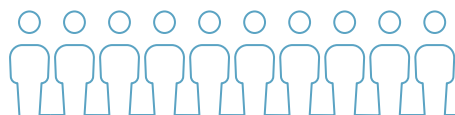
44% | **52%**
Strongly agree | Somewhat agree

Since organisations view technology as a means to augment the efforts of human workers¹⁶, nine in ten business leaders (33% to a large extent, 60% to a moderate extent) opine that thinking skills can help bridge the gap between technology and human capabilities within their organisation.

To what extent do you believe that thinking skills can help bridge the gap between technology and human capabilities within your organisation?



The ability to make strategic decisions due to strong thinking skills often leads to better outcomes for the organisation¹⁷. As such, most business leaders (54% very important, 44% somewhat important) also view thinking skills as important for employees to be more effective in their work, beyond technical skills or emerging technologies like AI.



Nearly all business leaders view **thinking skills as important** for employees to be more effective in their work, **beyond technical skills or emerging technologies like AI**.

54% | **44%**
Very important | Somewhat important

¹³ World Economic Forum. 2019. [These are the 10 most in-demand skills, according to LinkedIn](#)

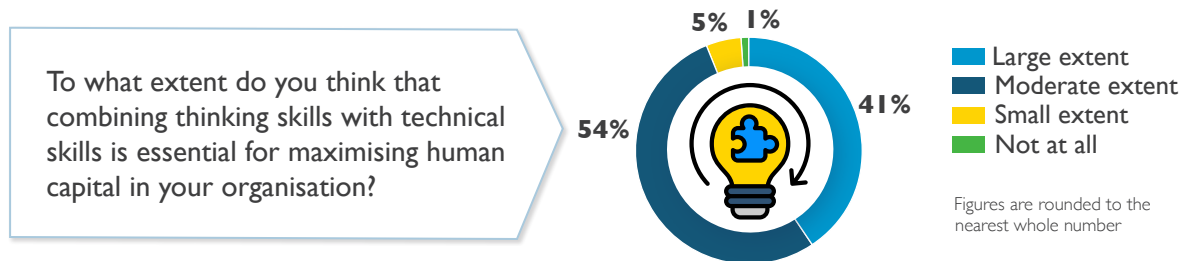
¹⁴ The Straits Times. 2023. [Ready and resilient: Report identifies top skill sets you need to thrive in the future](#)

¹⁵ Forbes. 2024. [In The Age Of AI, Critical Thinking Is More Needed Than Ever](#)

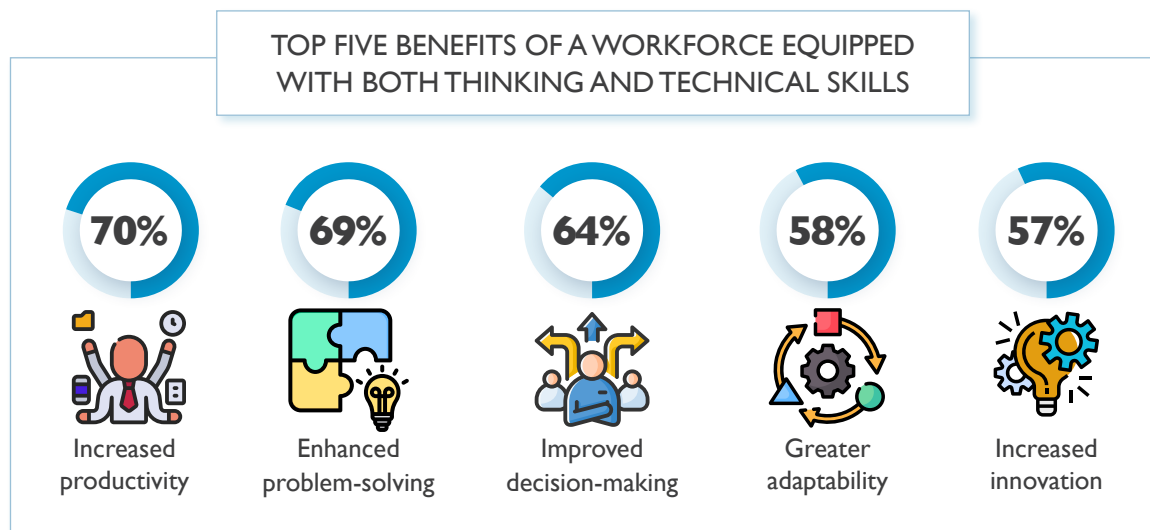
¹⁶ Deloitte. 2019. [Critical thinking rivals technical skills for Industry 4.0 success](#)

¹⁷ Forbes. 2023. [Why Your Business Needs Critical Thinking](#)

This sentiment may be rooted in the belief that a workforce with a greater mix of skills is crucial for business success as organisations with a highly-skilled workforce achieve higher productivity¹⁸. Consequently, half of business leaders (41%), believe that combining thinking skills with technical skills is essential for maximising human capital in their organisation to a large extent. This is followed by 54% believing so to a moderate extent, and 5% to a small extent.



The harmonisation of thinking and technical skills results in increased productivity (70%), enhanced problem-solving (69%), and improved decision-making (64%) according to business leaders. This is followed by greater adaptability (58%) and increased innovation (57%) as skills like creative thinking allow individuals to assess complex organisational challenges through different angles and adopt a growth mindset, often leading to creative breakthroughs¹⁹.



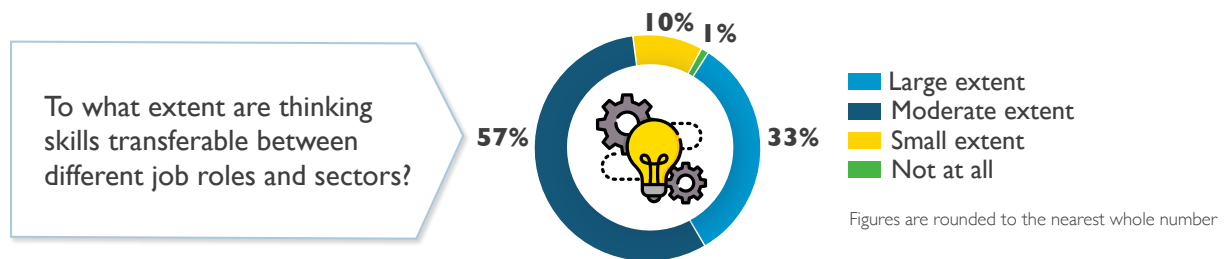
“The complexity of the modern workplace demands leadership accountability. As a result, critical thinking stands out as one of the essential skills that modern leaders should possess, augmenting with relevant technical skills to better navigate these challenges successfully. In this environment, strong decision-making and problem-solving abilities enable individuals to make sound strategic decisions that benefit their organisation. Similarly, adaptability allows them to embrace challenges with flexibility and openness to new approaches. Ultimately, employees who possess a well-rounded combination of technical and thinking skills are well-positioned to manifest their leadership potential,” says **Amos Tan, Chief Core Skills Officer, NTUC LearningHub.**

¹⁸ Deloitte. N.d. [Soft skills for business success](#)

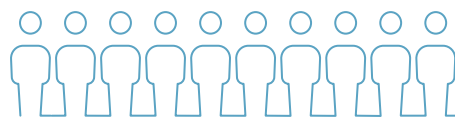
¹⁹ Forbes. 2024. [70% Of Employers Say Creative Thinking Is Most In-Demand Skill In 2024](#)

The Transferable Power of Thinking Skills

Since thinking skills can be applied to most roles and in the future tech-rich workplace²⁰, a third of business leaders (33%) endorse the transferability power of thinking skills as they believe thinking skills can be applied across diverse job roles and sectors to a large extent. This is followed by 57% and 10% of them who believe thinking skills are transferable to a moderate and small extent respectively.



Hence, almost all business leaders (45% very important, 51% somewhat important) emphasise the need for all employees, regardless of their industry or job role, to possess a fundamental level of thinking skills.



Nearly all business leaders think it is important for all employees to be **equipped with basic level of thinking skills**, regardless of their industry or job role.

45%

Very important

51%

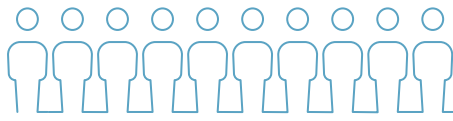
Somewhat important

“

Today's competitive business landscape is characterised by dynamic shifts in consumer expectations, technology disruptions, and the rapid evolution of job roles. In such an ever-changing climate, it is increasingly vital for employees to tap into their critical thinking abilities to address obstacles, adapt to changes, and make well deliberated decisions, ultimately boosting their productivity and personal effectiveness. As such, critical thinking is a highly transferable skill that is also essential for fostering resilience among employees. This not only empowers employees with the ability to meet challenges head on but will also unlock new opportunities for growth and innovation within their organisations, thereby positioning them for success,” says **Amos**.

²⁰ Deloitte. N.d. [Future skills: Keeping the workforce human](#)

Due to the transferability of these skills, nearly all business leaders (40% strongly agree, 57% somewhat agree) corroborate that thinking skills have the potential to facilitate seamless career transitions and advancements for employees.



Nearly all business leaders agree that thinking skills can help employees **better navigate career transitions and advancements**.

40%

Strongly agree

57%

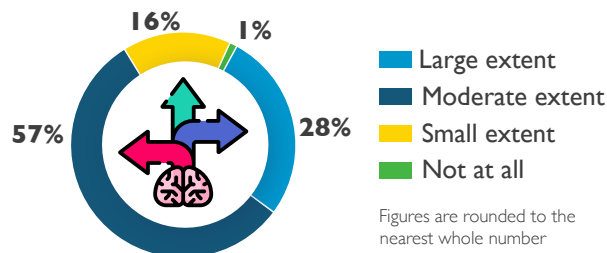
Somewhat agree

However, more than four in five business leaders (28% to a large extent, 57% to a moderate extent) believe that there is a gap in thinking skills among employees in their organisation to a certain extent.

The gap may stem from a lack of clear metrics/tools to measure progress in thinking skills development (41%), inconsistent understanding or definition of what constitutes effective thinking skills (38%) and difficulty in tailoring thinking skills training to suit diverse roles or departments (38%) alongside cultural factors that emphasise following instructions over independent thought (37%).

Additionally, business leaders cite a shortage of leaders within the organisation who demonstrate strong thinking skills (36%) as another key challenge they encounter when cultivating thinking skills among their employees. This shortage may be rooted in a command-and-control leadership style, where leaders prioritise technical skills over people management²¹.

To what extent is there a gap in thinking skills among employees in your organisation?



TOP FIVE CHALLENGES FACED IN CULTIVATING THINKING SKILLS AMONG EMPLOYEES



41%

Lack of clear metrics/tools to measure progress in thinking skills development



38%

Inconsistent understanding or definition of what constitutes effective thinking skills



38%

Difficulty in tailoring thinking skills training to suit diverse roles/departments



37%

Cultural factors that emphasise following instructions over independent thought



36%

Lack of leaders within the organisation who exemplify strong thinking skills

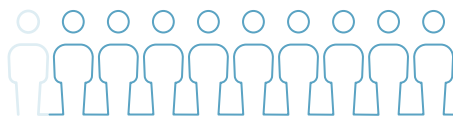
21 Forbes. 2024. [Graduates Lack Skills In Communication, Collaboration And Critical Thinking, Study Finds](#)



A key challenge in developing thinking skills is overcoming employees' reliance on routine tasks, as many see creative or critical thinking as abstract or time-consuming. Embedding thinking skills into practical tasks and linking them to real-world challenges helps demonstrate their benefits and encourages employees to step beyond their routines. Integrating thinking skills into technical training further strengthens these abilities—for instance, applying systems thinking in data analytics enables employees to assess broader implications, fostering both technical expertise and adaptability for long-term success,” says **Chien Ping**.

Bridging the Thinking Skills Gap with Training

Given that thinking skills are among the highly sought-after core skills among Singapore's workforce²², the need for adequate workforce training to close the skills gap is more pressing than ever²³. In fact, more than nine in ten business leaders (34% very important, 60% somewhat important) consider strong thinking skills crucial in their decision to hire candidates for their organisation.



More than 9 in 10 business leaders consider **strong thinking skills important in their decision to hire candidates** for their organisation.

34%

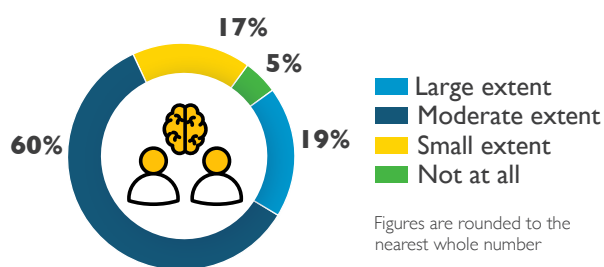
Very important

60%

Somewhat important

The growing demand for thinking skills likely explains the heightened emphasis on evaluating candidates' critical thinking capabilities, with over three-quarters of business leaders (79%) incorporating case studies or tests into their organisation's hiring process to a large or moderate extent.

To what extent do you utilise case studies and/or tests to assess candidates' thinking skills during your organisation's hiring process?



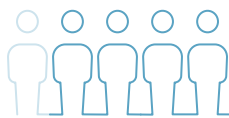
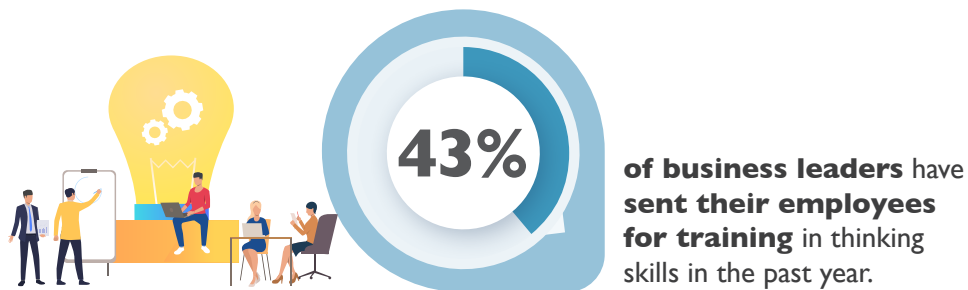
²² Yahoo! Finance. 2023. [3 soft skills that are most wanted in Singapore](#).

²³ Forbes. 2023. [Why Your Business Needs Critical Thinking](#)



In recruitment, we assess thinking skills through behavioural interviews, where candidates share how they've applied creative or critical thinking to overcome challenges. This offers insights into their strategic thinking and adaptability. Companies can also use scenario-based tasks, presenting candidates with hypothetical challenges like logistics bottlenecks to evaluate their problem-solving abilities. This approach identifies individuals with both technical expertise and the strategic mindset needed to navigate complex operational environments," says **Chien Ping**.

Despite its high demand, less than half of business leaders (43%) have sent their employees for training in this area in the past year. Nevertheless, a positive outlook remains as nearly four in five business leaders (24% very likely, 54% somewhat likely) are likely to send their employees for training in thinking skills, with about half (55%) intending to do so within the next six months and almost a third (31%) in the next one year.

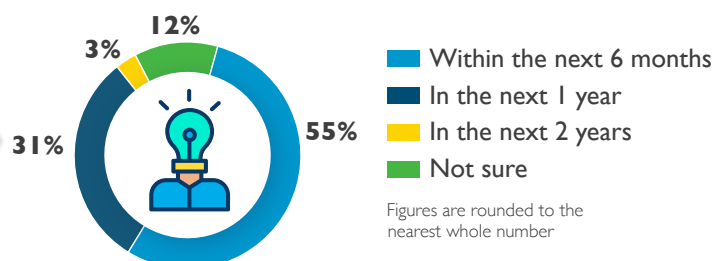


Nearly 4 in 5 business leaders are likely to send their employees for training in thinking skills.

24%
Very likely

54%
Somewhat likely

When are you likely to send your employees for training in thinking skills?



On a closer look, business leaders place equal importance on a variety of thinking skills with problem-solving (12%), strategic thinking (11%), and critical thinking (10%) ranking as the top three thinking skills important to their organisation. This underscores the necessity for a diverse set of skills to gain a well-rounded understanding of situations and tackle the various complex challenges present in the workplace²⁴.

RANK	THINKING SKILLS	WEIGHTED RANKING %
1	Problem-solving <i>Identifying solutions to specific challenges/issues</i>	12%
2	Strategic thinking <i>Developing long-term plans to achieve organisational goals</i>	11%
3	Critical thinking <i>Evaluating information and data to make reasoned decisions</i>	10%
4	Analytical thinking <i>Breaking down complex information into easy to understand patterns</i>	10%
5	Logical thinking <i>Systematic reasoning and drawing conclusions based on clear, rational principle</i>	10%
6	Agile and lean thinking <i>Adapting to quick change and offering incremental improvements efficiently</i>	9%
7	Systems thinking <i>Understanding how different components of a system interact with each other</i>	9%
8	Creative thinking <i>Coming up with innovative and original ideas/solutions</i>	9%
9	Design thinking <i>Understanding and addressing people's needs through feedback</i>	8%
10	Statistical thinking <i>Using statical methods and data analysis to make informed decisions</i>	7%
11	Computational thinking <i>Using computational tools and methods to develop solutions</i>	7%

24 Forbes. 2023. [Why Your Business Needs Critical Thinking](#)



The significance of cultivating a diverse set of thinking skills cannot be emphasised enough for success at work today and in the future. For example, adopting a critical and analytical mindset, augmented with emerging technologies enables employees to dissect a wide range of information or problems, tackle them in a rational manner, while applying design thinking skills will facilitate the creation of impactful solutions. This interplay among different skills is crucial for employees to navigate challenges smoothly and thrive in a dynamic and complex work environment. However, as new technologies continue to emerge and the value of thinking skills continues to grow, so too will the skills gap. Thus, it is paramount that employers tap on the comprehensive critical core skills training offered by training providers like NTUC LearningHub to bridge this gap and ensure the long-term success of both their organisations and their workforce,” says Amos.

Conclusion

As the future workplace continues to evolve with the integration of advanced technologies, the value of human capabilities become even more apparent. While organisations increasingly rely on innovations like AI, enhanced and quality outputs are only possible when human skills like critical thinking and creative thinking are leveraged. These skills allow individuals to successfully navigate an environment increasingly saturated with data and information as they empower them with the ability to analyse content, make informed decisions, and successfully harness emerging technologies to further business goals.

However, thinking skills are not only valuable for tech-related roles but are highly relevant across a myriad of positions and industries as employees face complex challenges in various contexts. It is therefore clear that technical expertise alone is not sufficient. Rather, a balanced combination of technical and thinking skills is crucial for thriving in the future workplace. Thus, skills training is more vital than ever to bridge the skills gap, or both organisations and employees risk falling behind.





To find out more about how you or your company can tap on training schemes and grants to upskill in Thinking Skills, contact **NTUC LearningHub** [here](#).

SURVEY BACKGROUND

RESEARCH METHODOLOGY

NTUC LearningHub ran an online poll at the start of September 2024 to investigate the role of thinking skills in complementing technical skills to build a resilient workforce capable of navigating the complexities of the emerging digital economy. Our report also explores the transferability of thinking skills across industries and roles, underscoring the need for training to enhance workers' adaptability and career prospects.

RESPONDENT PROFILE

The survey gathered a total of 200 business leaders, consisting of 52% males and 48% females; senior managers (75%) and directors and above (25%).

The profile of respondents includes those from private sector MNCs (52%), private local SMEs (27%), private large companies (6%) and other companies (15%). Additionally, we sampled respondents from various industries including Financial Services (9%), Manufacturing (9%), Infocomm Technology (8%), and others (7%).

About NTUC LearningHub

NTUC LearningHub is the leading Continuing Education and Training provider in Singapore which aims to transform the lifelong employability of working people. Since our corporatisation in 2004, we have been working with employers and individual learners to provide learning solutions in areas such as Infocomm Technology, Generative AI & Cloud, Healthcare, Retail & Food Services, Employability & Literacy, Business Excellence, Workplace Safety & Health, Security, Human Resources & Coaching and Foreign Workers Training.

To date, NTUC LearningHub has helped over 29,000 organisations and achieved close to 2.6 million training places across more than 2,900 courses with a pool of about 900 certified trainers. As a Total Learning Solutions provider to organisations, we also forge partnerships to offer a wide range of relevant end-to-end training. Besides in-person training, we also offer instructor-led virtual live classes (VLCs) and asynchronous online learning. The NTUC LearningHub Learning eXperience Platform (LXP) — a one-stop online learning mobile application — offers timely, bite-sized and quality content for learners to upskill anytime and anywhere. Beyond learning, LXP also serves as a platform for jobs and skills development for both workers and companies.

For more information, visit www.ntuclearninghub.com.



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