

# CADT

Cambodia Academy of  
Digital Technology



**Topic: Digital Skill Assessment** (Prepared by CADT and CDRI)

Event: The Asia and the Pacific Regional Dialogue on Digital Transformation, 8<sup>th</sup> December 2021

# Objectives of the project

## DEMAND SIDE

1. Assess the current ICT job markets and the use of digitization by firms.
2. Identify the challenges faced by firms in recruiting qualified ICT employees and those with basic digital literacy.
3. Understand how they address recruitment challenges.

## SUPPLY SIDE

1. Identify ICT-related subjects and skills universities/TVET institutions offer to students.
2. Examine challenges and concerns ICT students are facing in their career advancement.
3. Quantify labor market outcomes of ICT students compared to those of non-ICT students.

# A multi-stakeholder approach to the assessment

## Supply

*Educational institutions*



- Skills supplied
- Courses offered
- Curriculum design
- Linkages
- Internship and Counseling

*Students/Graduates*



- Degree and skills choice
- Labour market performance
- Internship and apprenticeship

## Demand

*Employers*

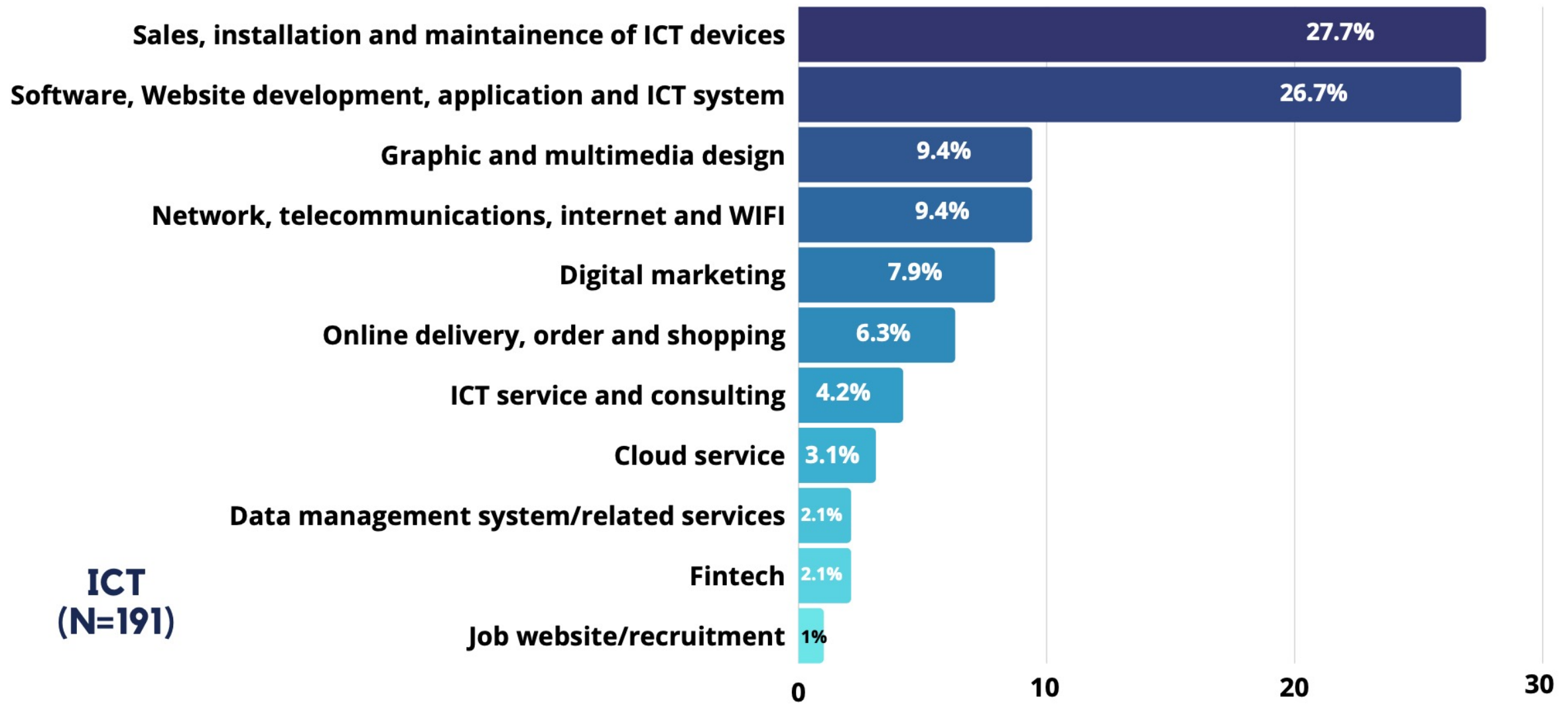


- Skills needs
- Investment in reskilling and upskilling
- Linkages
- Technology adoption

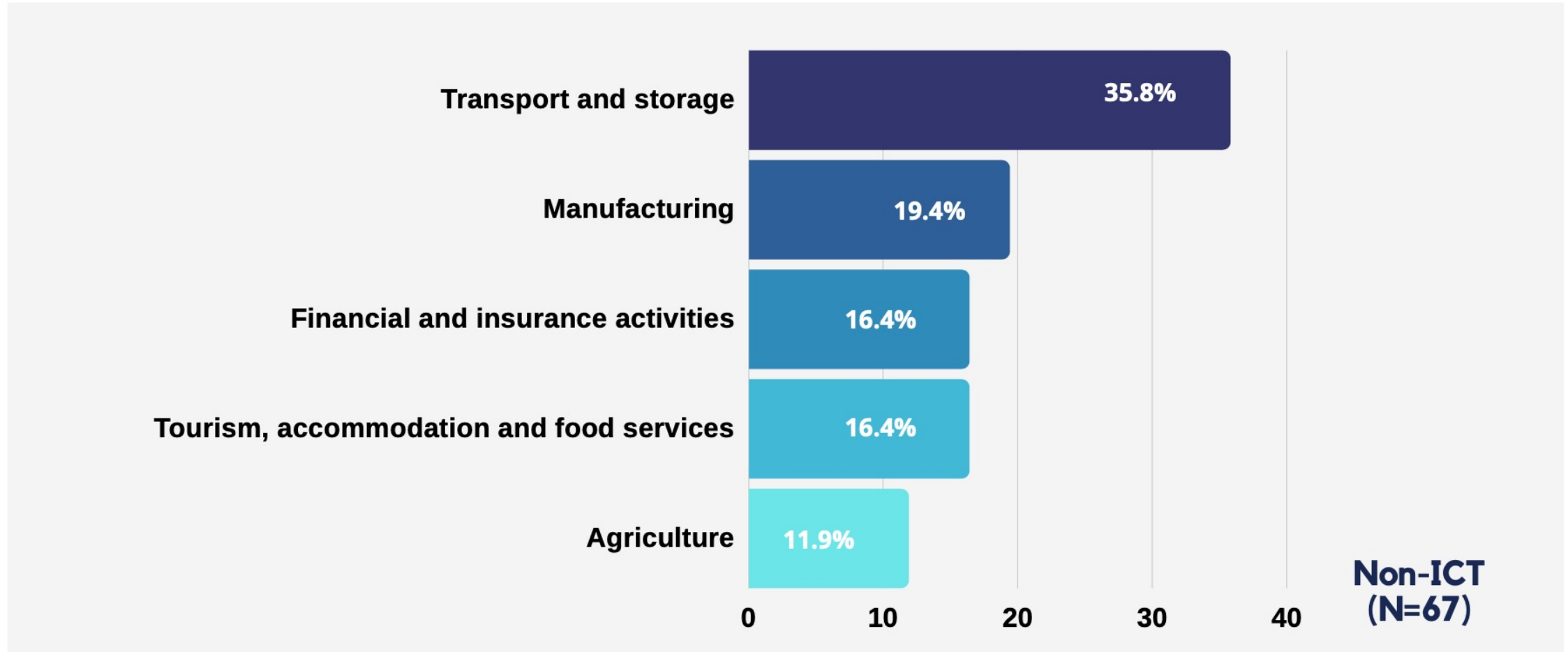


**Government Cross-cutting measures**

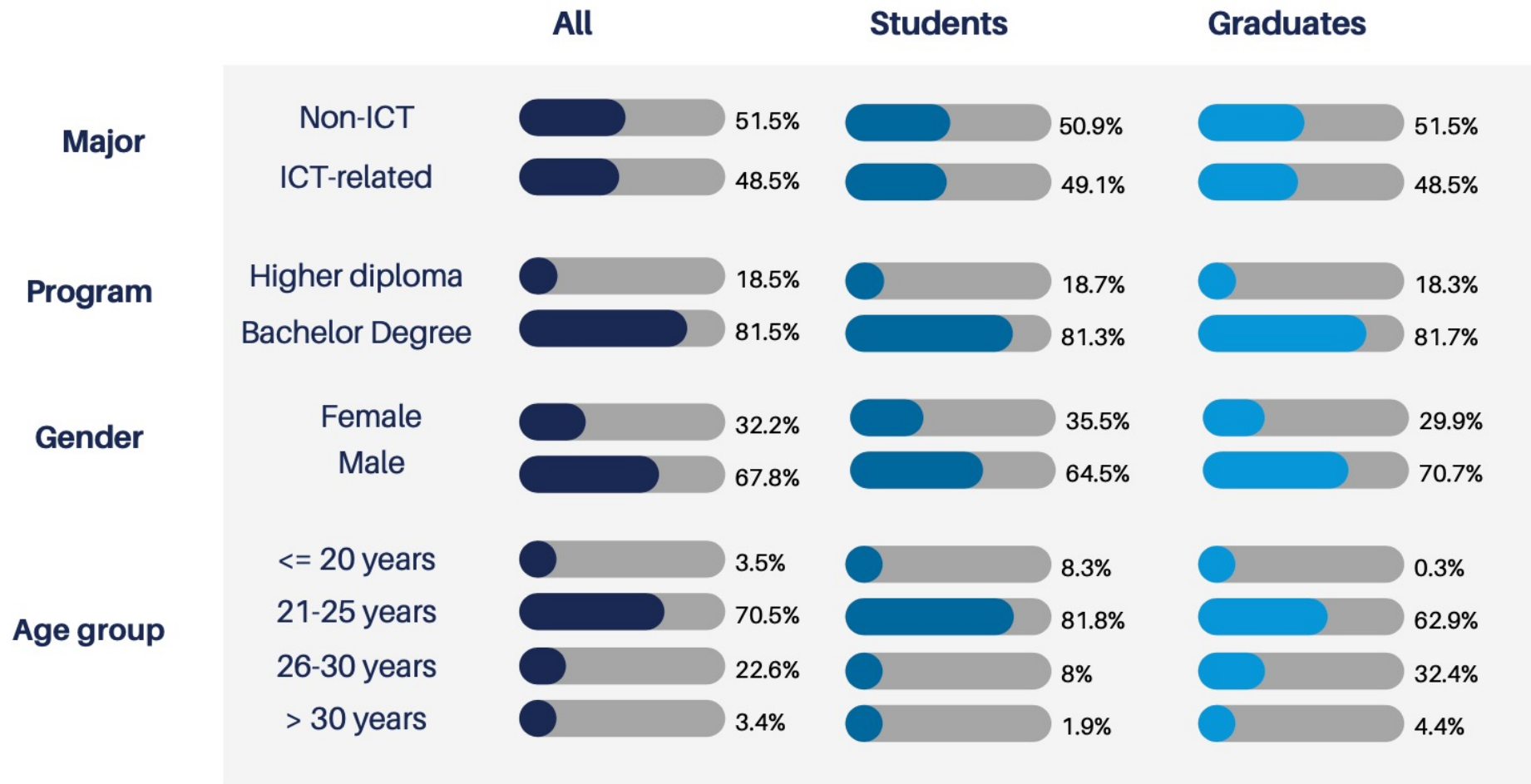
# Services and products offered by sample ICT firms



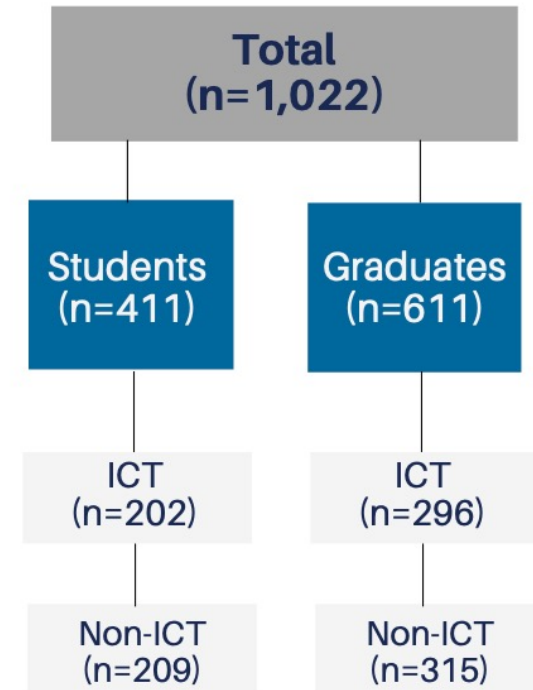
# Services and products offered by sample non-ICT firms



# Stratified random sampling and sample size: student/graduate survey



## Sample characteristics





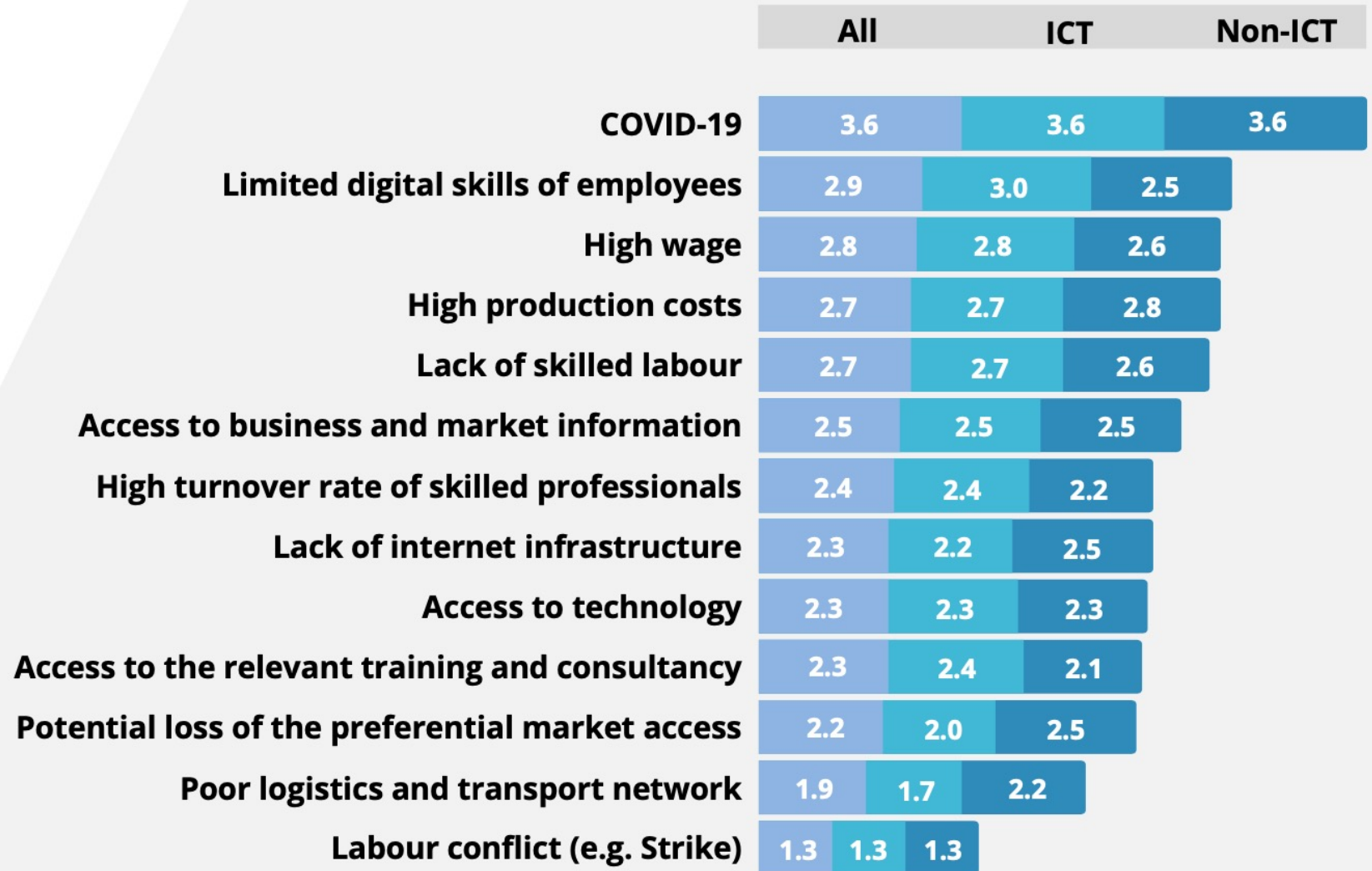
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# Main findings



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# The challenges reported by sample firms





# The impacts of COVID-19

- COVID-19 was reported by ICT and non-ICT firms as the biggest challenge impacting operations and profits.
- There have been adoption of digital technology in response to COVID-19, but not significantly.
- Digital marketing and online sales are the most common.
- Educational institutions and students also adopt technologies in teaching and learning, but uneven.
- Covid-19 is likely to have widen the digital divide between the rich and the poor and between urban and rural students.

# EdTech adoption during Covid-19



## SWITCH TO DIGITAL

After school shutdown in March 2020, all sampled HEIs have switch to online or remote teaching and learning by August 2020.



## SLOW ADOPTATION

However, while some schools could establish their Learning Management System (LSM), some provincial schools merely used messaging platforms (i.e., telegram or messenger) to keep.



## COMMON PLATFORMS

Microsoft Teams or Google G Suit for Education are the most common platforms used by HEIs, although a few schools used open-source Moodle as their LSMs.



## TRADITIONAL CLASSROOM PREFERENCE

Nearly half of the survey students are unsatisfied with the online learning offered by their schools, and most of students prefer traditional classroom.



## CHALLENGES

Challenges include poor internet connection (especially in rural areas), student assessment, technological readiness of students and teachers.

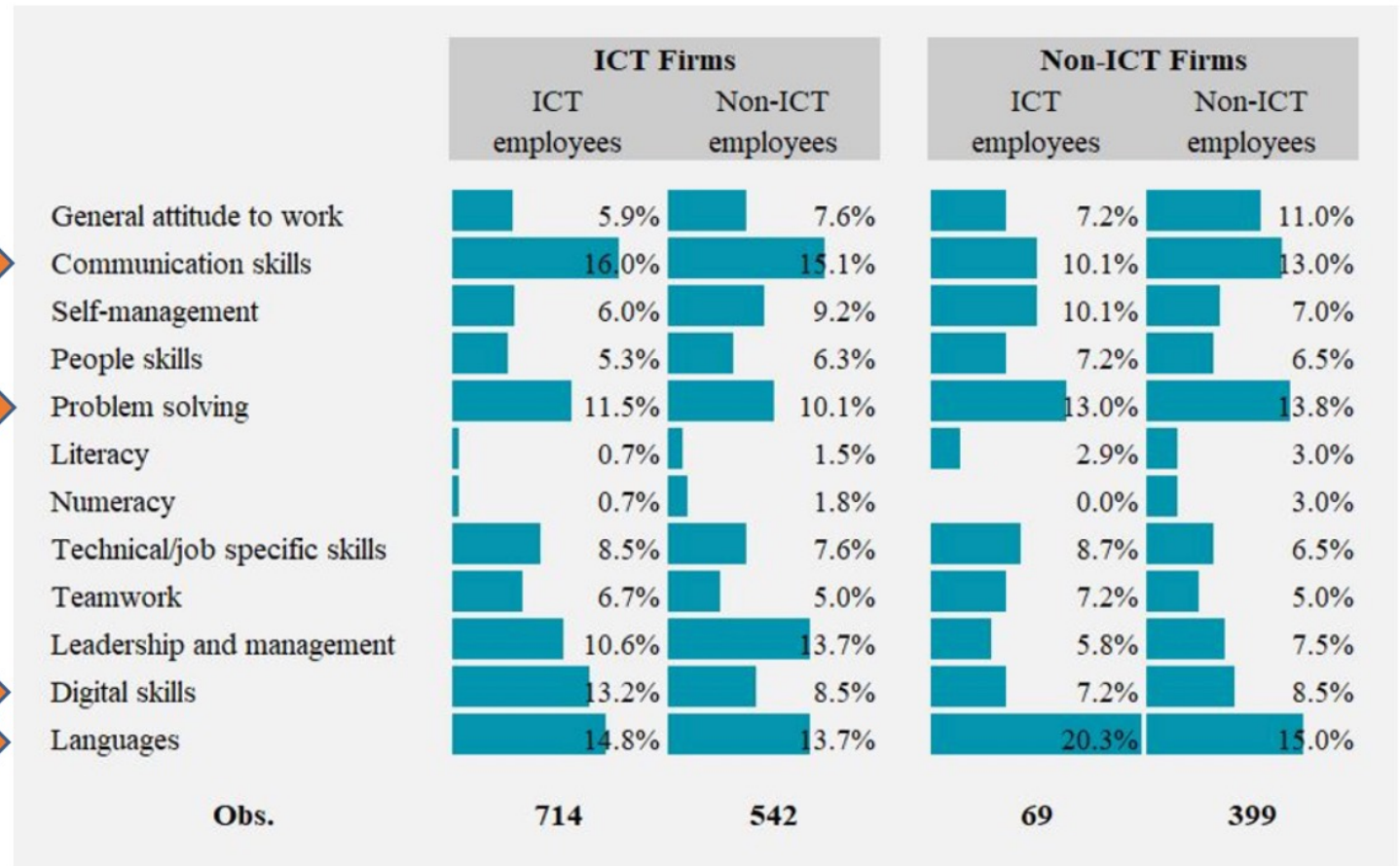


## CONTINUED ONLINE OFFER

Nevertheless, nearly all interviewed HEIs intend to continue to offer online course (either in blended format or separated courses) even after the covid-19.

## General skills gaps reported by the sample firms

**Skill mismatches and shortages remain for both ICT and non-ICT firms. General and digital**



## Digital skills gaps reported by sample firms

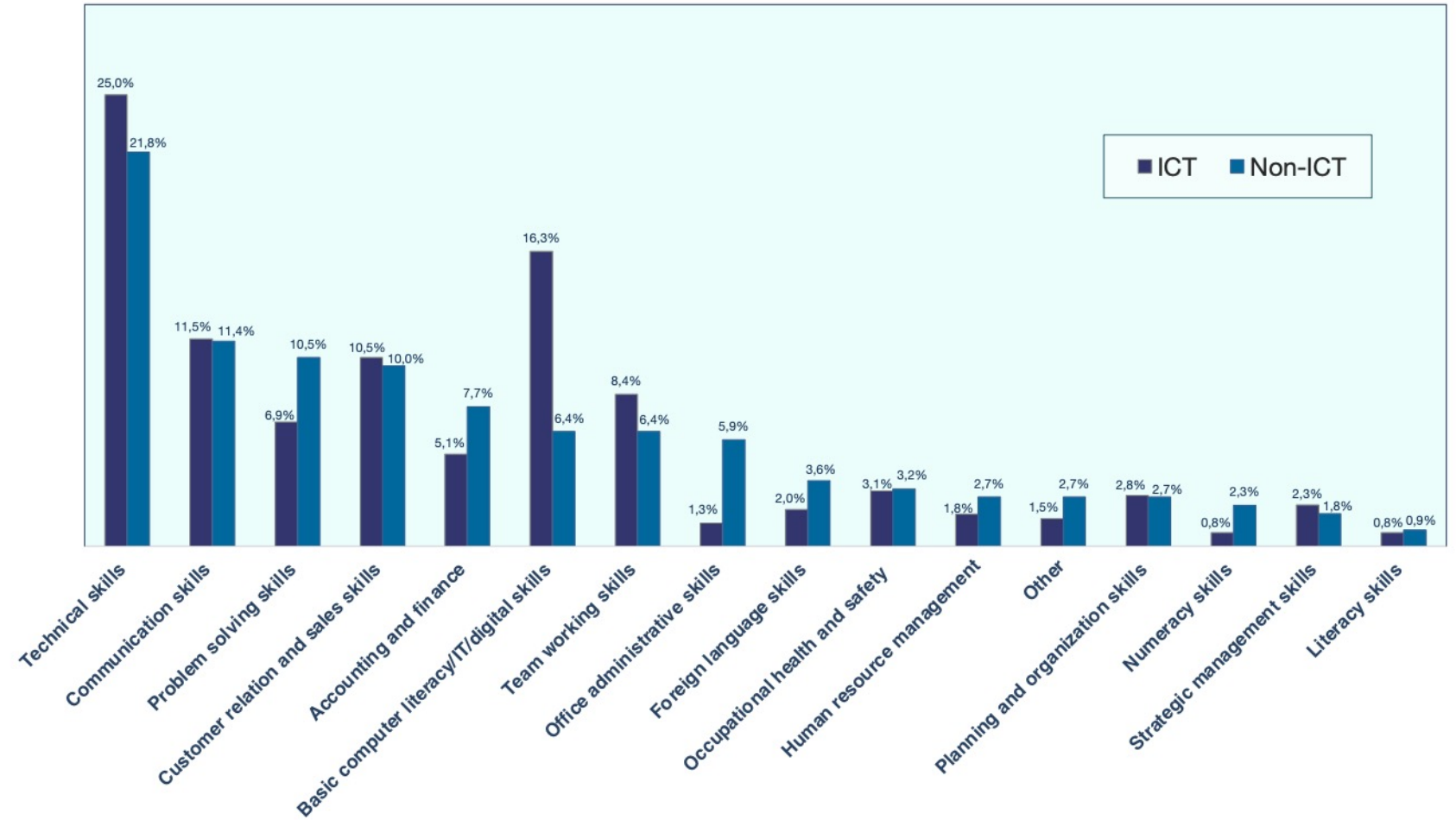
Digital Skills	ICT Sector		Non-ICT Sector	
	ICT employees	Non-ICT employees	ICT employees	Non-ICT employees
<b>Basic Skills</b>				
Literacy	5	6	0	2
Numeracy	3	8	0	6
Writing	4	15	2	10
Communication skills	7	13	1	14
Understanding the basic laws and ethics applying to use ICTs	8	4	0	4
Hardware	12	4	0	1
Software skills	31	16	1	8
Protecting personal data	9	9	0	3
Health (e.g. ergonomics of ICT usage)	9	6	0	1
Environment issues (e.g. relating to disposal of ICTs)	9	5	0	2
Identifying, evaluating and procuring relevant ICTs	6	5	0	1
Browsing, searching and filtering information	13	9	0	3
Evaluating information	14	6	0	2
Retrieving and storing information	14	9	0	5
Interacting and collaborating through ICTs	8	5	0	2
Sharing information and content	7	7	1	2
Engaging in online citizenship	5	6	1	2
Netiquette	10	8	1	1
Managing digital identity	16	10	1	2
<b>Workforce Skills</b>				
Using relevant apps to create documents	7	10	0	3
Using information of various digital formats effectively and efficiently	8	10	0	2
Legal, contractual and ethical conditions relating to the workplace	13	7	0	2
Digital skills specific to changing workplace environments	20	12	1	2
<b>Professional Skills</b>				
Developing and re-purposing content	27	13	0	1
Adopting appropriate good practice regarding copyright and licensing	12	7	0	1
Applications/programming skills	24	15	1	3
Evaluating and using physical versus cloud-based ICT infrastructures	11	9	0	2
Solving information, software and technical (hardware) problems	14	13	0	2
Creativity and innovation using technology	21	8	2	2
Reviewing and evaluating ICT developments	9	7	0	2
Protecting sensitive information	14	7	0	2
Cybersecurity - Securing IT infrastructures	8	8	0	2
Policies and practices for securing extended information infrastructures	9	7	12	2



Assessing demand for and supply of ICT and digital skills

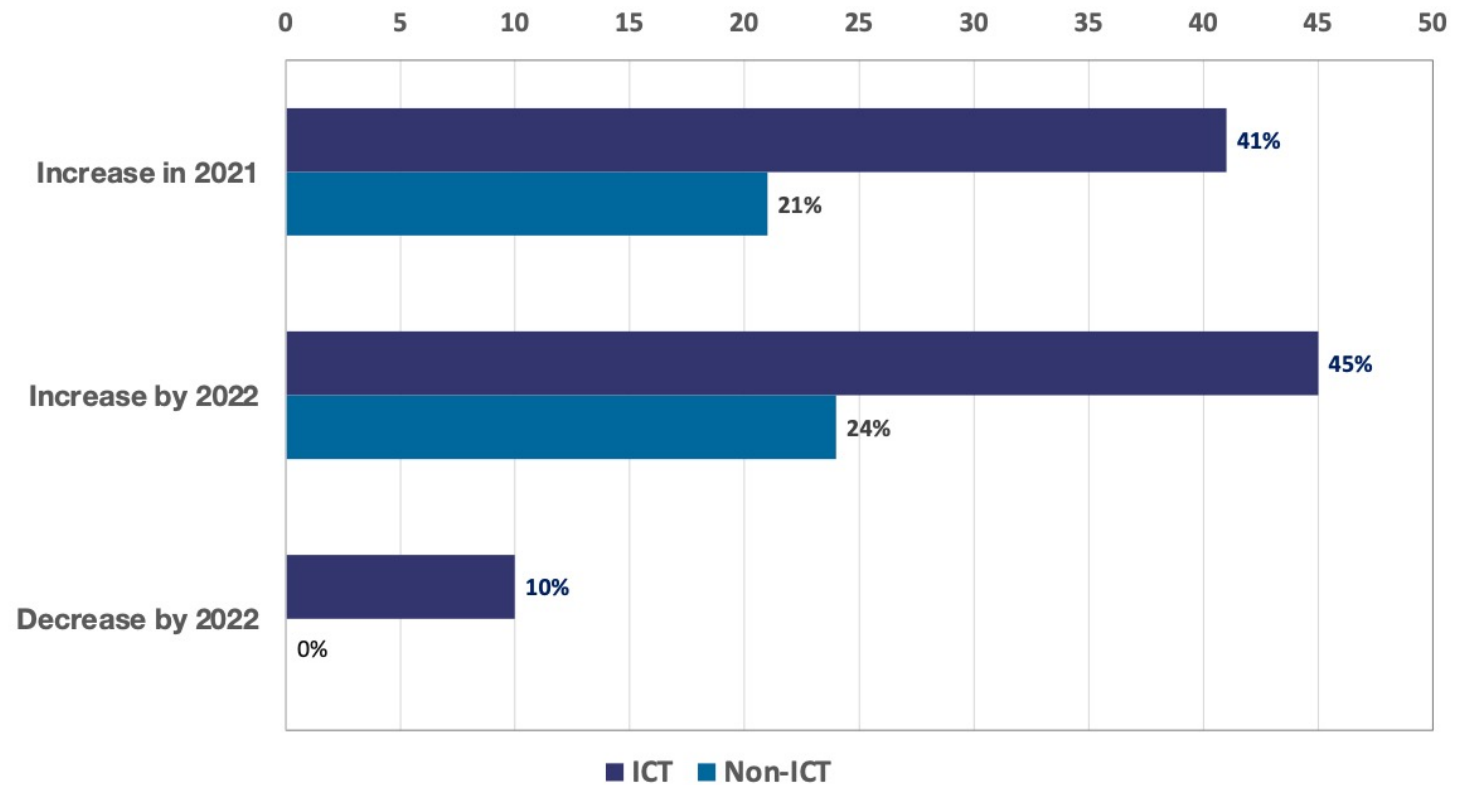
How did the sample firms deal with the skills gaps?

**On-the-job training.**



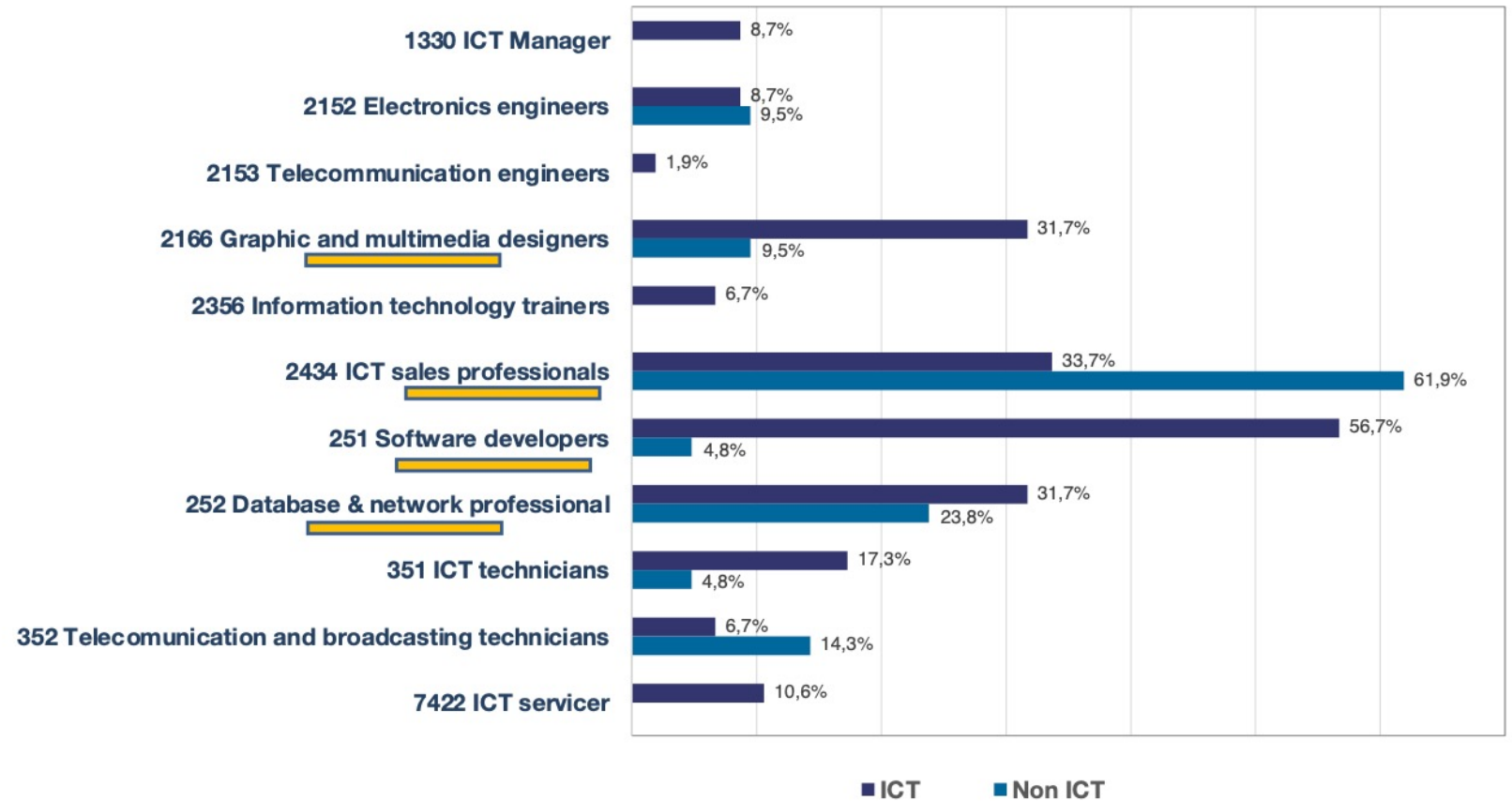
## A. Average percentage change in ICT employee

Demand for ICT and digital skills is expected to increase in the next two years, averaging 40% for ICT firms and 20% for non-ICT ones.



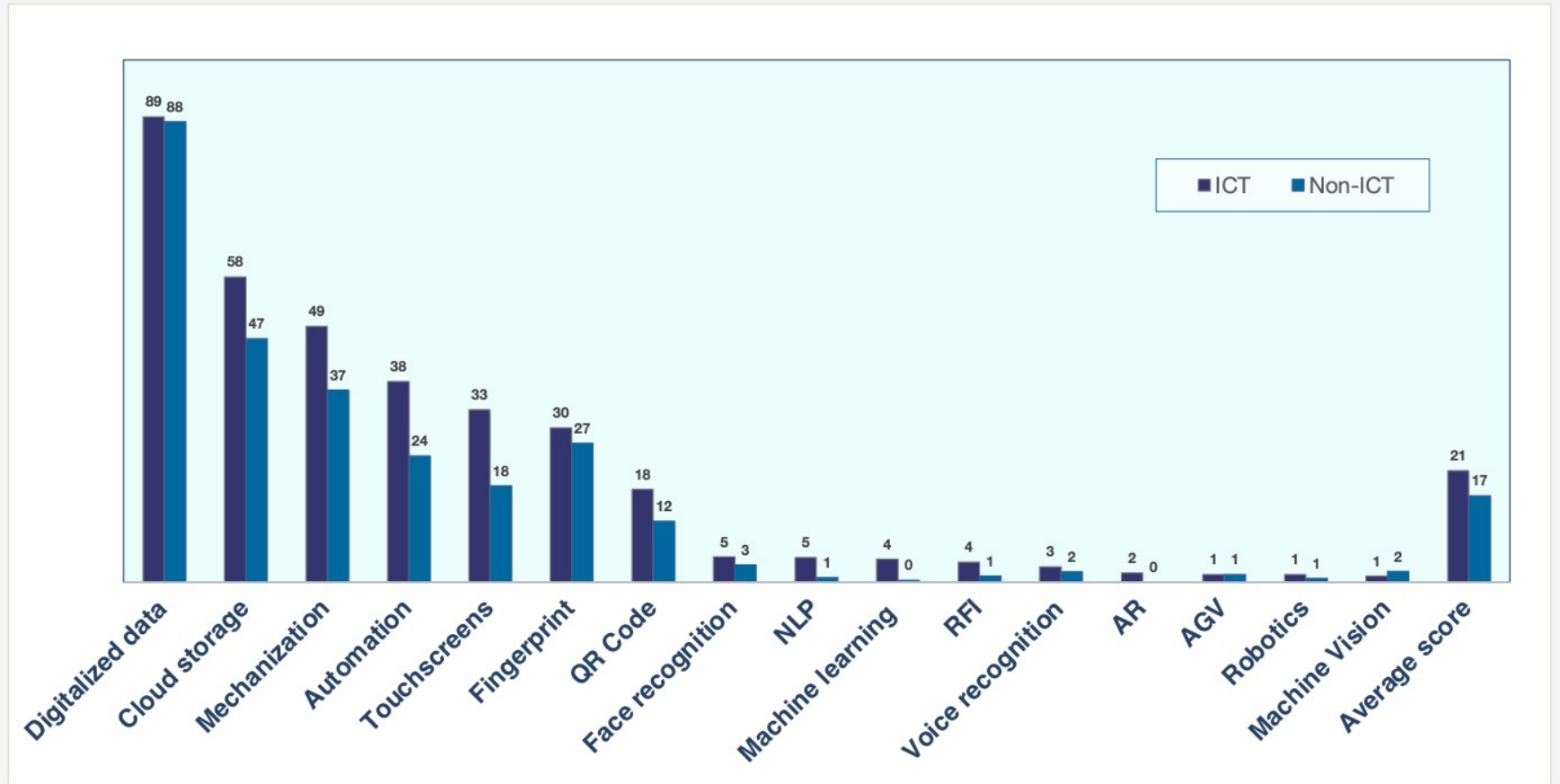
## B. Future demand for ICT occupations

Demand for ICT and digital skills is expected to increase in the next two years, averaging 40% for ICT firms and 20% for non-ICT ones.



## Firms' use of new technology

The use of new technology remains low and is mostly basic technology.





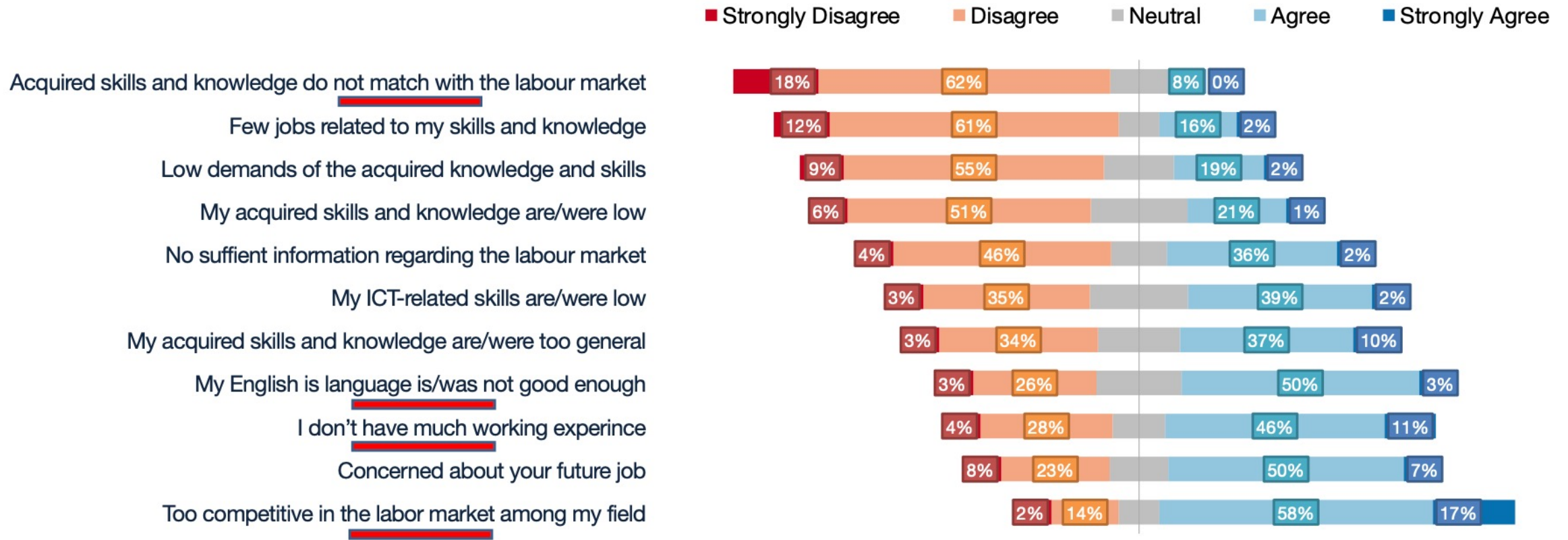
# ICT curriculum

- Curricula are designed by individual HEIs, but they need approval from supervising ministries.
  - About one-fourth of the curricular is dedicated to general subjects (English, mathematics and statistics, etc.).
  - Programming (17%), system and software (14%), network (12%).
  - New technologies (such as AI, fin-tech, data science, or cyber-security) are not common subjects among the sampled HEIs.
- Very few schools offer dedicated subjects related to soft skills.
  - Most schools also offer basic computer course (MS Office, e-mail and internet) to their non-ICT students.
  - Industry-university linkages are still weak as many HEIs are mainly informed about the demands through their alumni.

power outlet.

Programming		System and Software		Network			Web Development			
Introduction to Programing	Java	System Analysis and Design		Computer Network	Network Administration	Data Communication and Network	Web Programming	ASP.NET, PHP & MySQL	Web Design	
C++	OOP			CISCO	Network and Security	Client/Sever	Communication and Design			
Mobile Programming	C#	Others	Operating System	Database			Graphic Design	Photography and Videography	Multimedia	
.NET	C	Pytho n		Computer Architecture and Design	Database Management System	Management Information System				Database Server (SQL)
			Computer Foundations	MS Office	Database Application and Design	Database Serve (Oracle)	Application Software		New Technologies	
					Others	Others	MS Office	Others	E-Commerce	AI
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## Competitiveness in the labour market, lack of working experience and english proficiency seem to be the forefront concerns of students. They are less concerned about the skill mismatches.



## Main Messages

- ❖ The demand for ICT and digital skills is expected to **grow**. There have, however, been mismatches and shortages of qualified ICT workforce.
- ❖ The occupational demand will be: ICT sales professional, software, application and web developer, multimedia and graphic designers (including e-marketing professionals), and programmers.
- ❖ Firms deal with the ICT and digital skills mismatches and shortages by providing **on-the-job training**.

## Main Messages

- ❖ Despite the constant growth, tertiary enrolment in STEM majors including ICT remains low. Enrollment in STEM majors remains male dominated.
- ❖ Higher education institutions face several challenges in keeping up with the current trends of technological changes.
- ❖ Those include **limited support from the government**, **limited financial and human resources**, and **uneven ability and preparedness of students who enroll in the STEM programs in mathematics and digital literacy.**

# Some recommendations



**Continue to strengthen industry-university and university-university linkages. A promising mechanism is establishing a sector skills council for ICT**



**Continue to provide on-the-job training as it would help address skills shortage and mismatch given the fast-changing technological advancement.**



**Better equip students at upper secondary school with basic ICT and digital skills and mathematical competency.**



**Ensure inclusive STEM education for girls and students in/from rural areas.**



**Capitalize and equip universities/TVET institutions, particularly ones in the province.**



**Combine hard and soft skills both at school and at work.**

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**Many thanks for your attention.**

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**We are happy to answer questions.**