Virtual Launching Ceremony

Demand for and supply of digital skills in Cambodia

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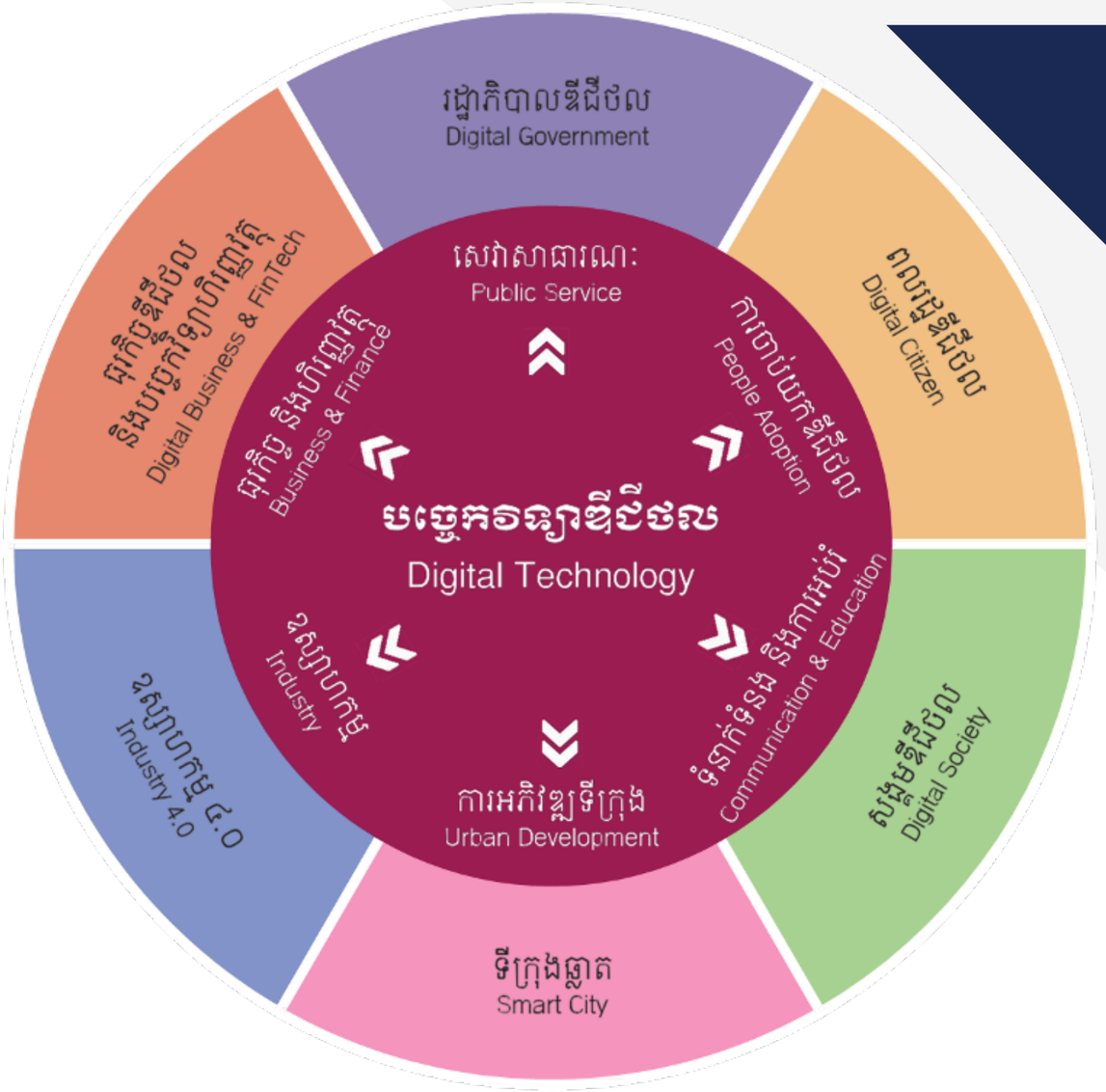
Economic and societal aspects of digital transformation



Source: RGC (2021, p.4). Cambodia Digital Economy and Society Policy Framework 2021-2035. Phnom Penh.

Digital skills and education would be an enabling factor. Nonetheless,

- Skill mismatches and shortages are common, in developing and developed economies.
- Some degree of mismatch or shortage is inevitable in the short term. It can slow down innovation and adoption of new technologies.
- Public policies could help address the issue and the successes of the policy intervention depend, to a large extent, on having good information on current and future skills needs.

Objectives of the project

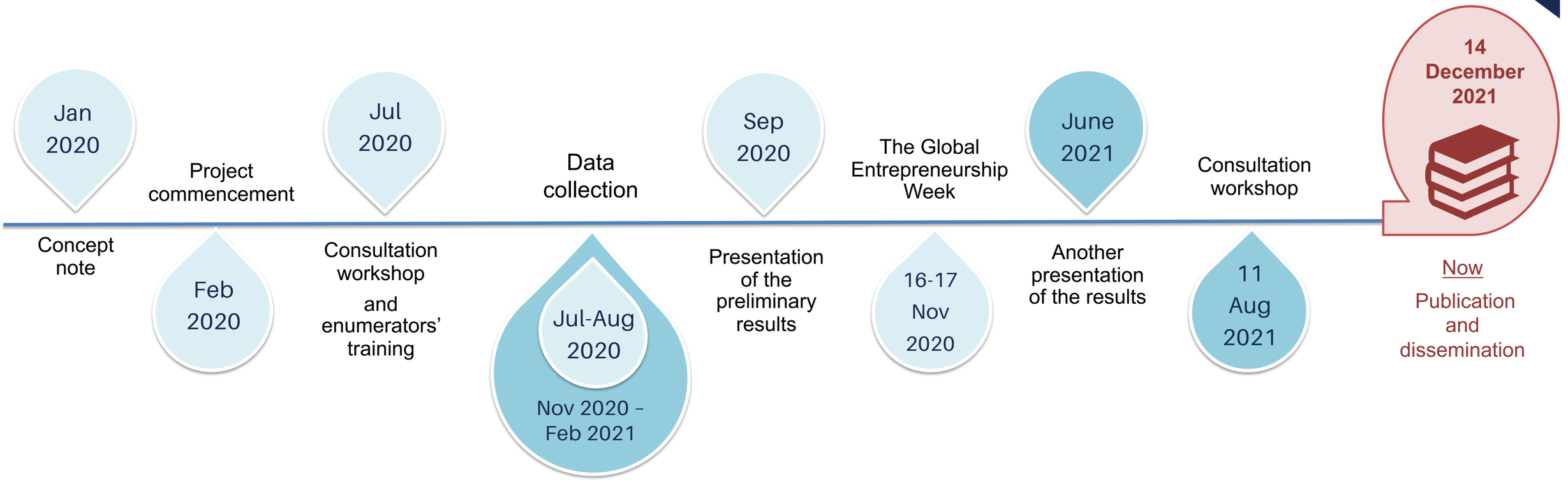
DEMAND SIDE

1. Assess the job markets for digital skills (ICT included) and the use of digitization by firms.
2. Identify the challenges faced by firms in recruiting qualified digitally-skilled employees and those with basic digital literacy.
3. Understand how they address recruitment challenges and the skills mismatch.

SUPPLY SIDE

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

Project timeline



(2) Project overview

A multi-stakeholder approach to the assessment

Supply

Educational institutions

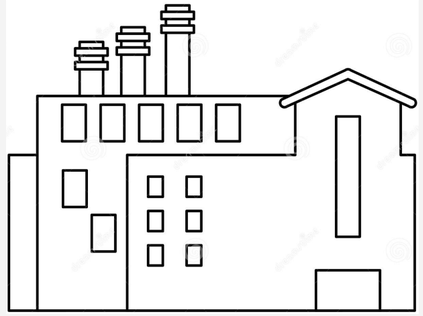
- Skills supplied
- Courses offered
- Curriculum design
- Linkages
- Internship and counseling

Students/Graduates

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

Demand

Employers

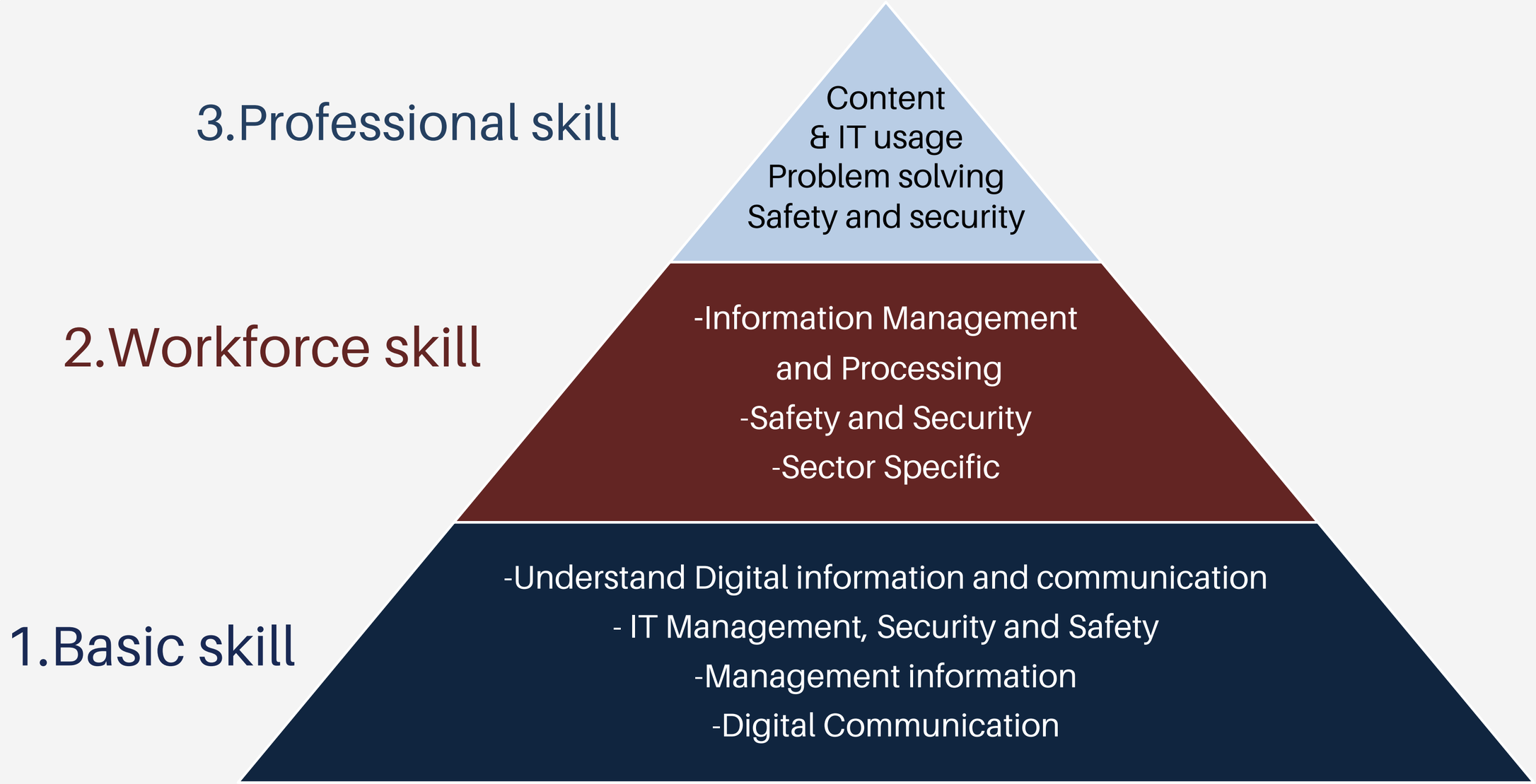


- Skills needs
- Investment in reskilling and upskilling
- Linkages
- Technology adoption

Government cross-cutting measures

(3) Project overview

Defining digital skills

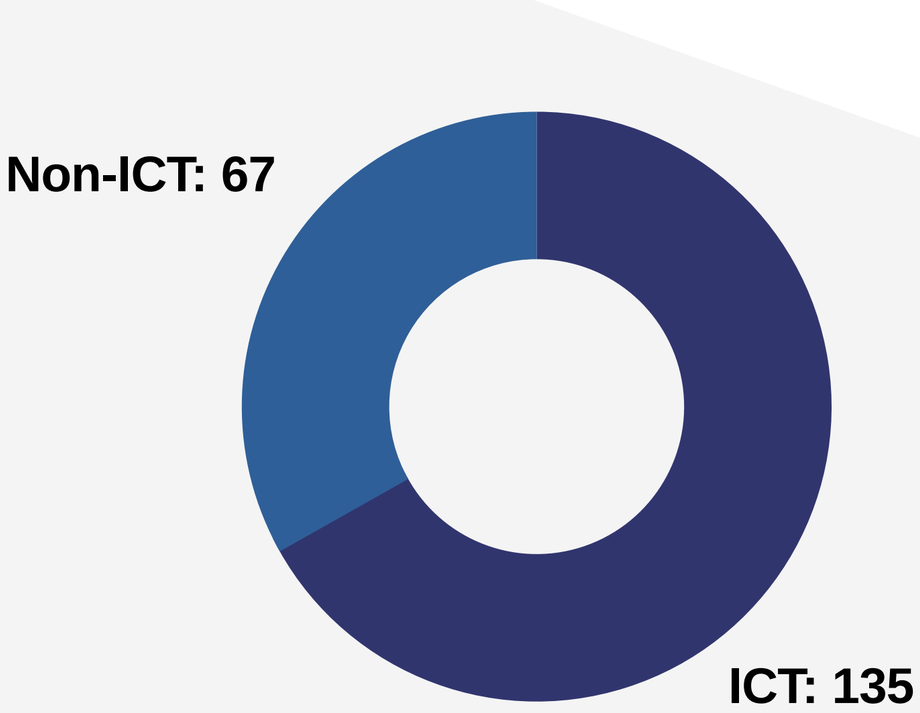


Source: ECORYS UK (2016)

Stratified random sampling and sample size: firm survey

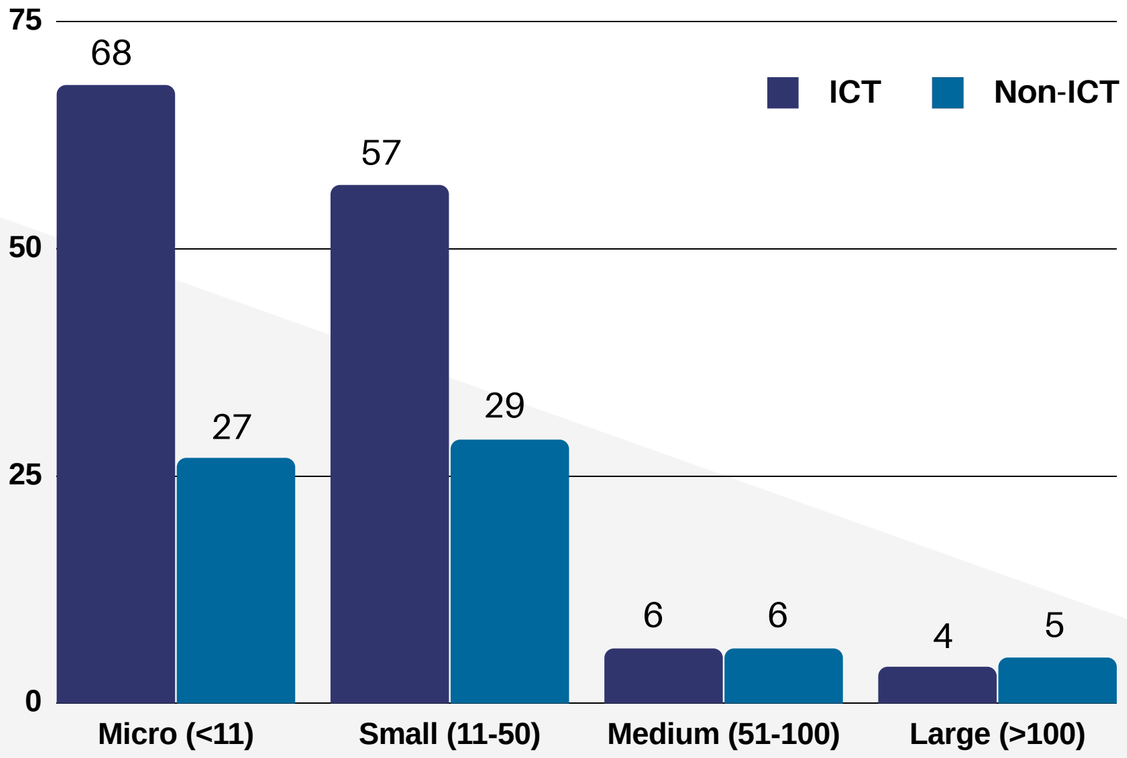
By firm type

(n=202)

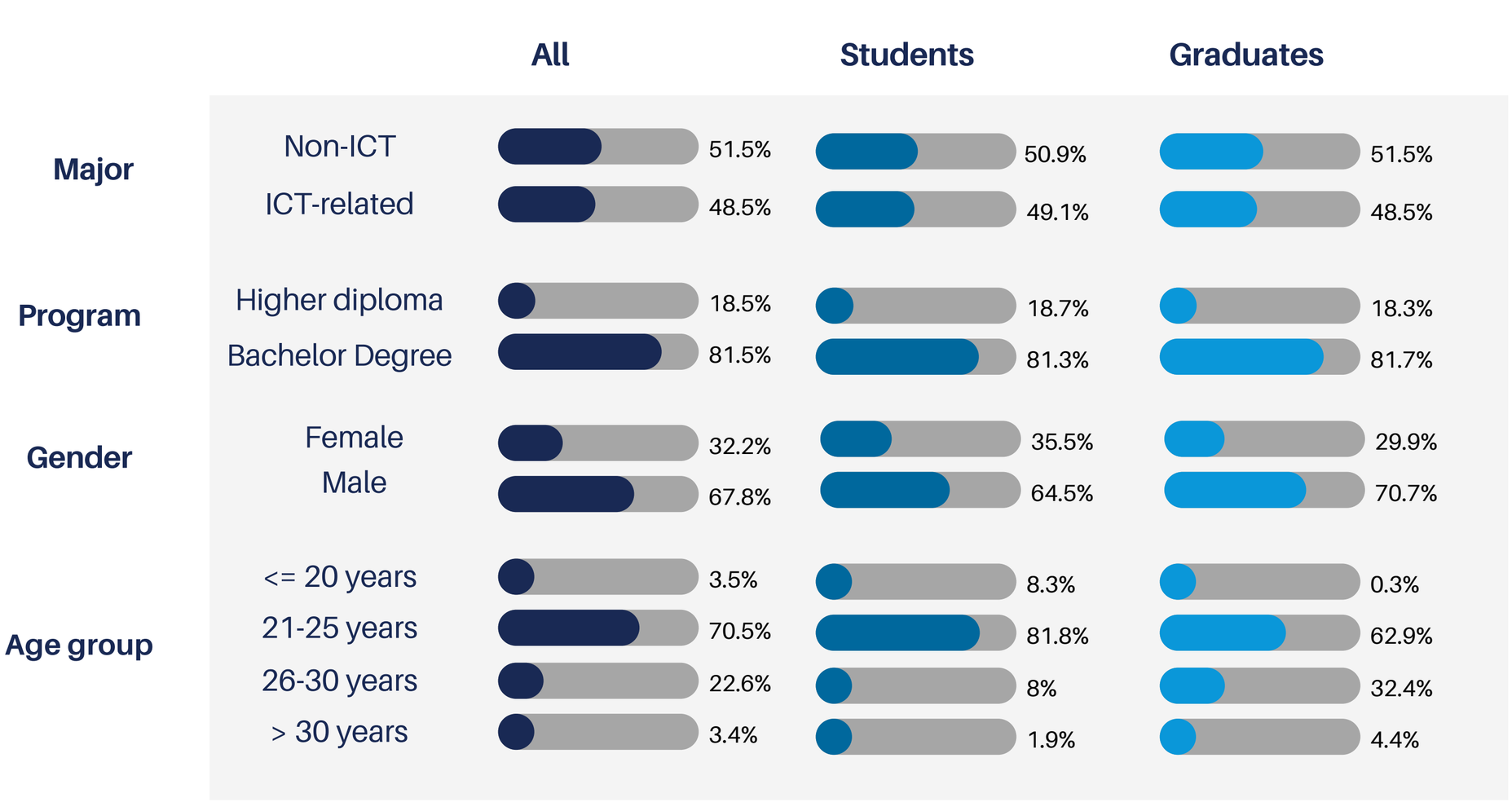


By size of employee

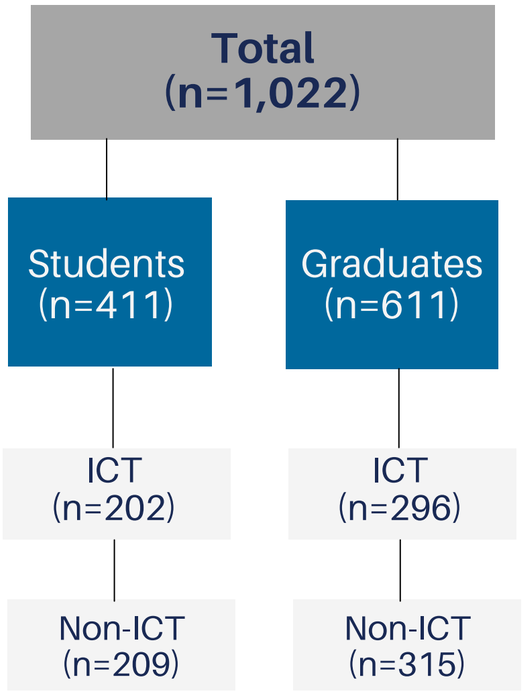
(n=202)



Stratified random sampling and sample size: student/graduate survey



Sample characteristics

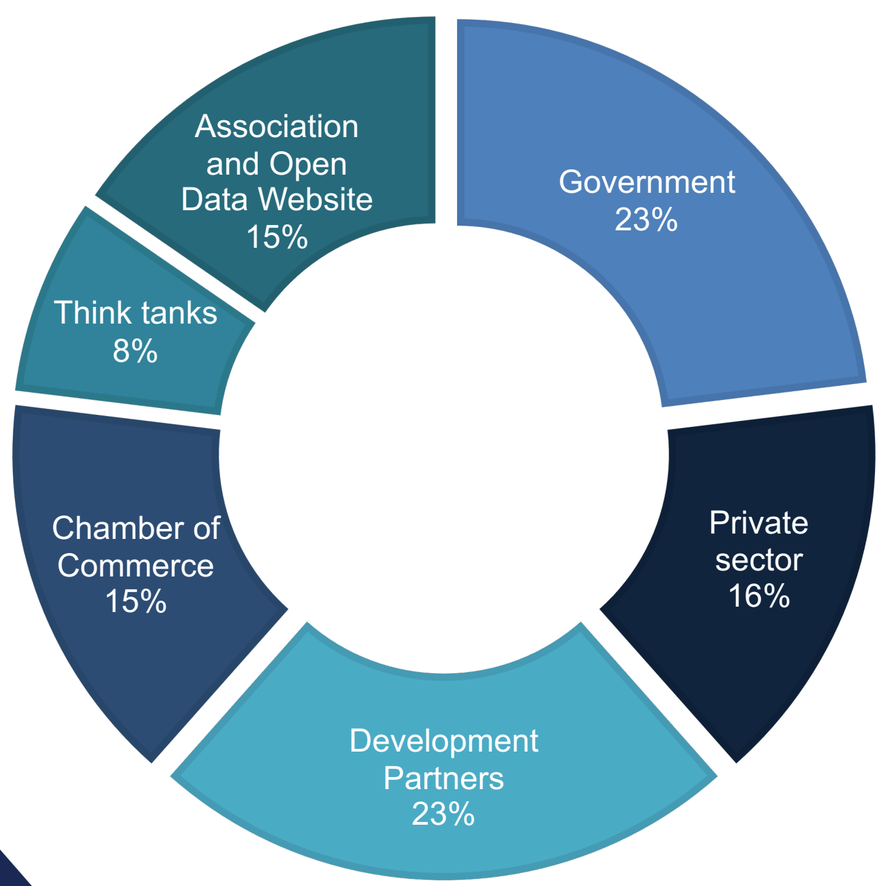


Sample size for qualitative component

Demand Side

Key Informant Interviews with stakeholders

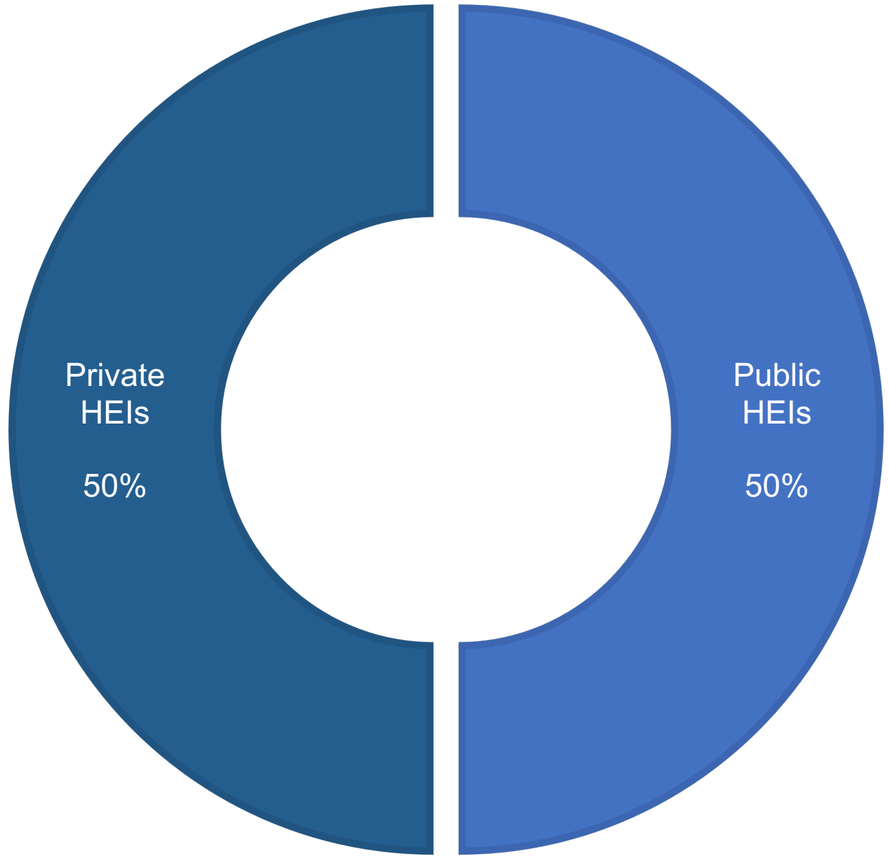
(n=13)



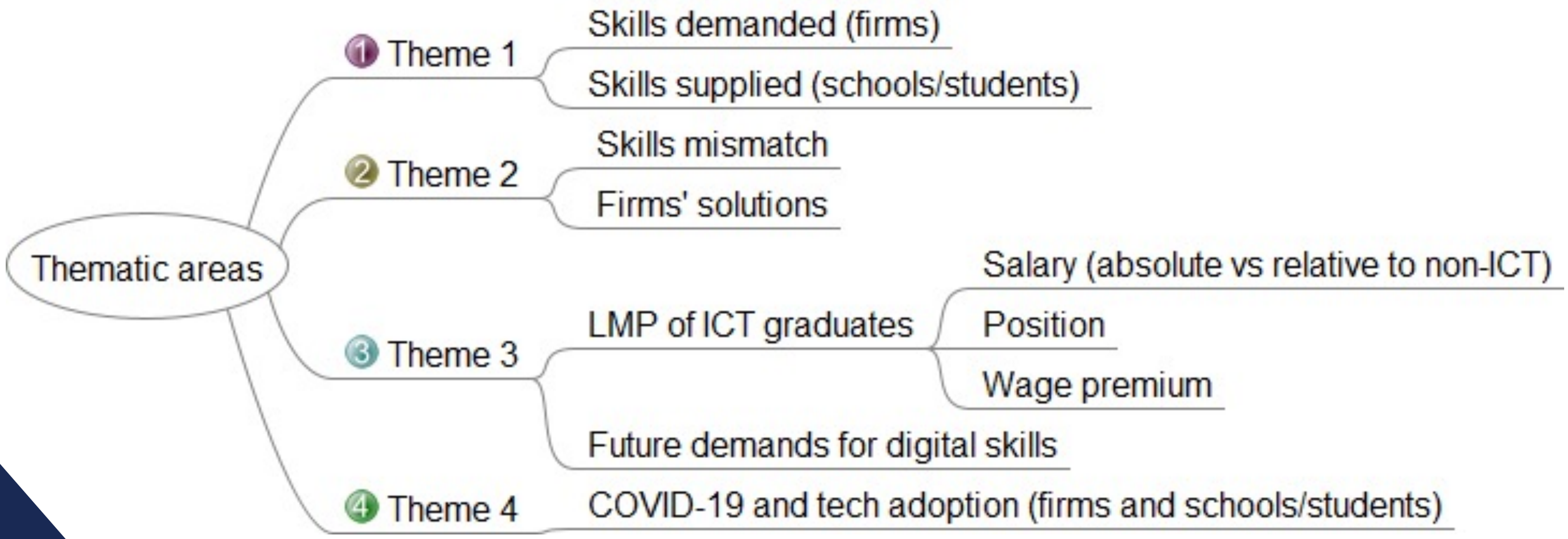
Supply Side

Key Informant Interviews with HEIs

(n=18)



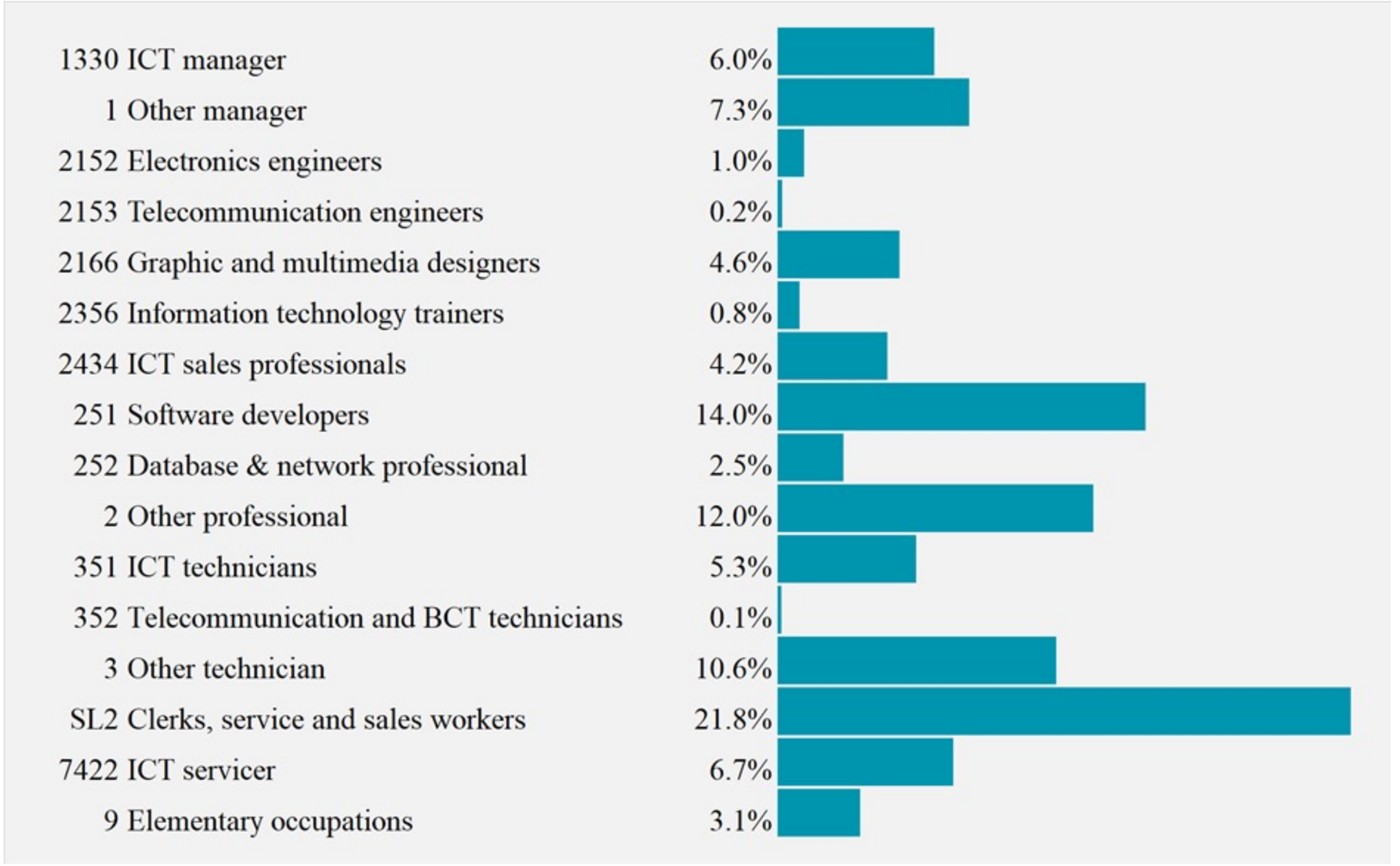
Main findings are presented based on the following themes.



(3) Main findings

Theme 1: (a). Occupational types in ICT firms

5 most prevalent ICT occupations in ICT firms: software and application developers and analysts, ICT servicers, ICT managers, ICT technicians and graphic and multimedia designers.

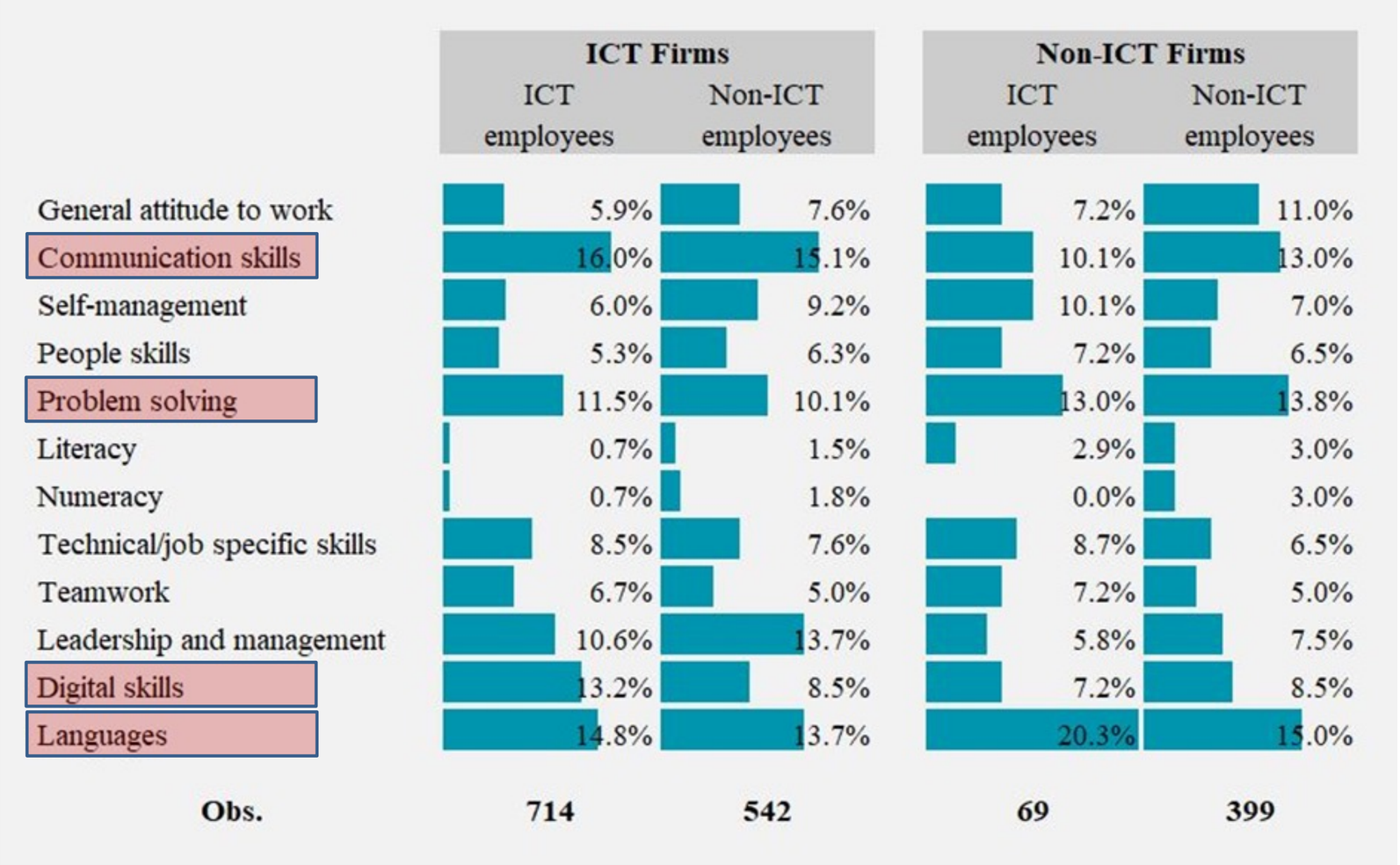


(3) Main findings

Theme 1: (a). General skills gaps reported

Among ICT employees, communication, foreign languages, digital and problem-solving skills are reported skills gaps.

These skills are also common skills gaps reported among non-ICT employees.



(3) Main findings

Theme 1: (a). Digital skills gaps

Digital skills gaps reported by sample firms

Digital Skills	ICT Sector		Non-ICT Sector	
	ICT employees	Non-ICT employees	ICT employees	Non-ICT employees
Basic Skills				
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
Workforce Skills				
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
Professional Skills				
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	0	2

(3) Main findings

Theme 1: (b). Skills supplied

STEM enrollment in Cambodia remains low by regional standards.

Country	Year	Science	Technology	Engineering	Mathematics	Total
Malaysia	2019	1.6%	6.9%	28.6%	3.7%	40.8%
Brunei	2019	N/A	13.6%	18.1%	8.4%	40.1%
Myanmar	2018	0.6%	2.2%	8.0%	23.6%	34.3%
Singapore	2018	0.2%	8.6%	19.6%	5.3%	33.7%
Philippine	2017	3.3%	12.0%	15.3%	1.5%	32.0%
Thailand	2016	3.0%	4.5%	19.0%	4.3%	30.9%
Lao	2019	7.5%	8.5%	12.7%	2.0%	30.7%
Vietnam	2016	4.5%	2.1%	19.9%	0.7%	27.2%
Cambodia	2019	3.8%	9.7%	9.0%	4.5%	27.0%
Indonesia	2018	4.1%	8.3%	7.9%	3.3%	23.5%

Source: UNESCO Institute of Statistics (accessed on June 05, 2021)
Note: i) Science majors: agriculture, forestry, fisheries, ii) Technology majors: information and communication technologies, iii). Engineering majors: engineering, manufacturing, and construction; and iv). Mathematics majors: mathematics, and statistics.

(3) Main findings

Theme 1: (b). Skills supplied

ICT enrolment is concentrated in the Capital.

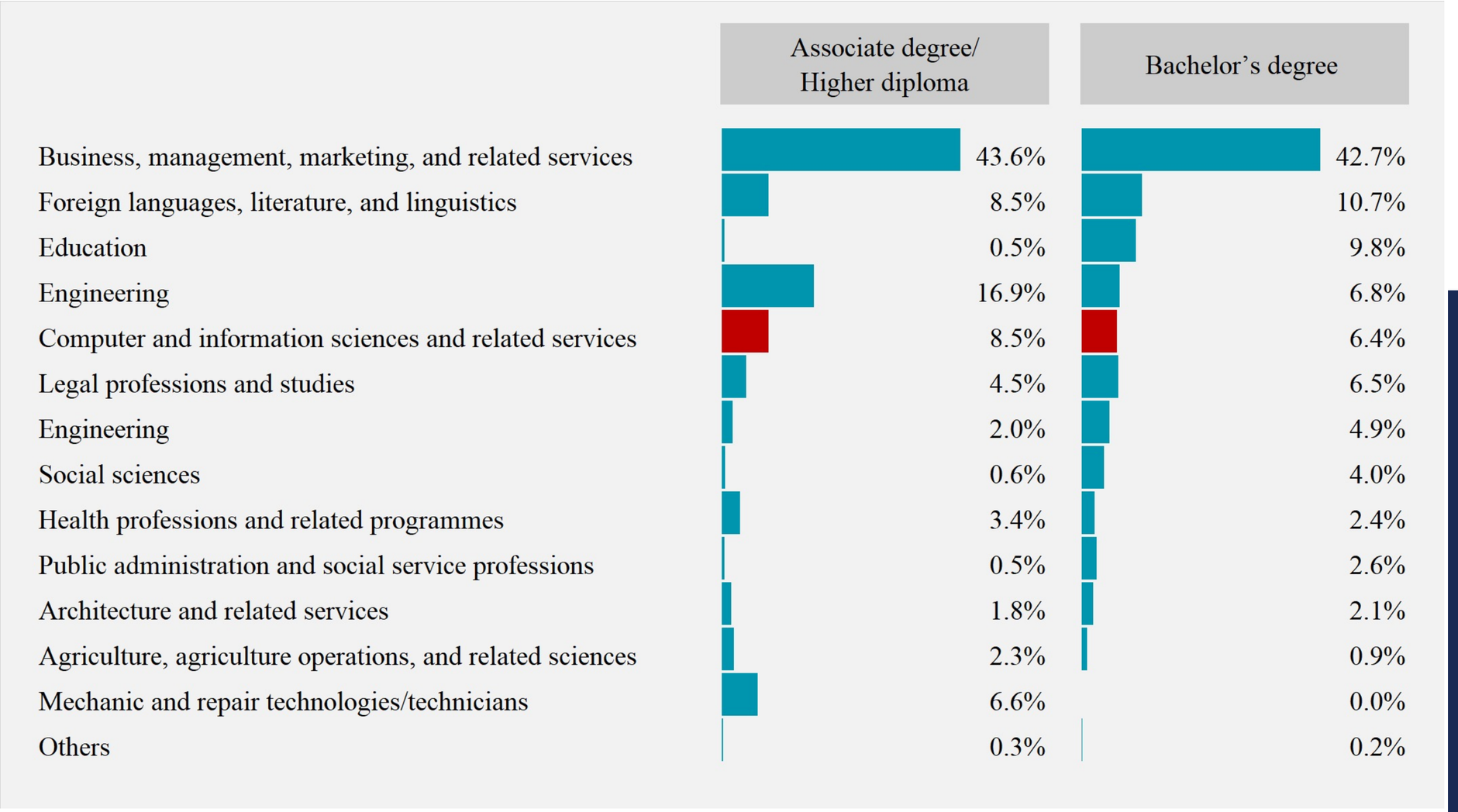
Province	Associate degree/ Higher diploma		Bachelor's degree		Total	
	Enrolment	Provider	Enrolment	Provider	Enrolment	Provider
Phnom Penh	1,461	17	10,873	35	12,334	36
Battambang	143	5	649	6	792	7
Siem Reap	77	3	706	5	783	7
Kampong Speu	72	2	233	2	305	3
Svay Rieng	78	1	200	2	278	2
Banteay Meanchey	90	3	148	3	238	4
Kampong Cham	88	3	120	4	208	5
Kampot	35	3	162	2	197	4
Takeo	16	2	141	3	157	4
Other Provinces	219	10	510	9	729	16
Total	**2,279**	**49**	**13,742**	**71**	**16,021**	16,021	88	**88**

Source: Authors' calculation based on MoEYS and MLVT statistics for the 2018-2019 academic year

(3) Main findings

Theme 1: (b). Skills supplied

ICT enrolment remains low relative to other majors.

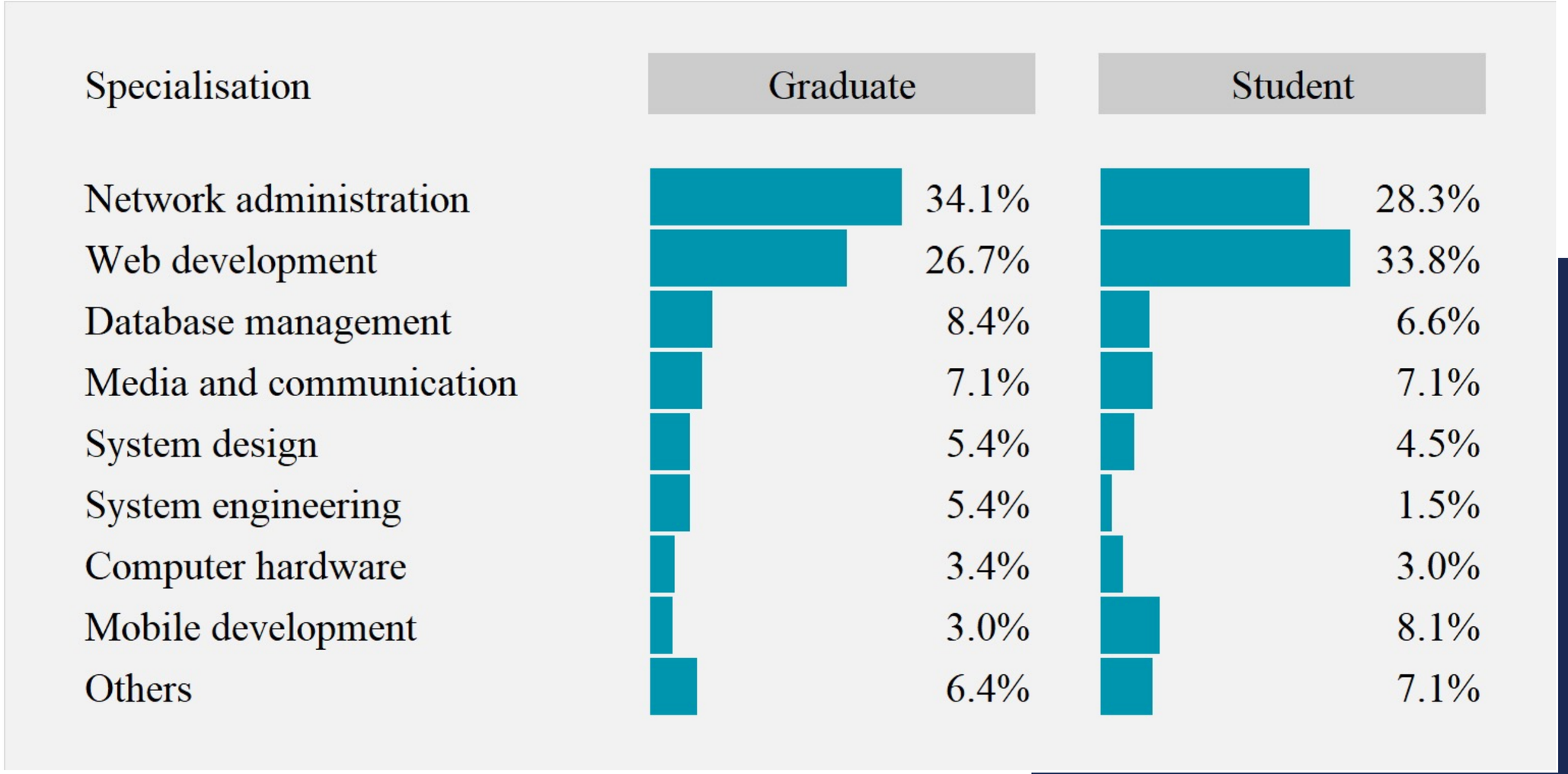


Source: Authors' calculation based on MoEYS and MLVT statistics for the 2018-2019 academic year

(3) Main findings

Theme 1: (b). Skills supplied

Network administration and web development are most common ICT majors.



Source: Authors' calculation using data from the student/graduate survey

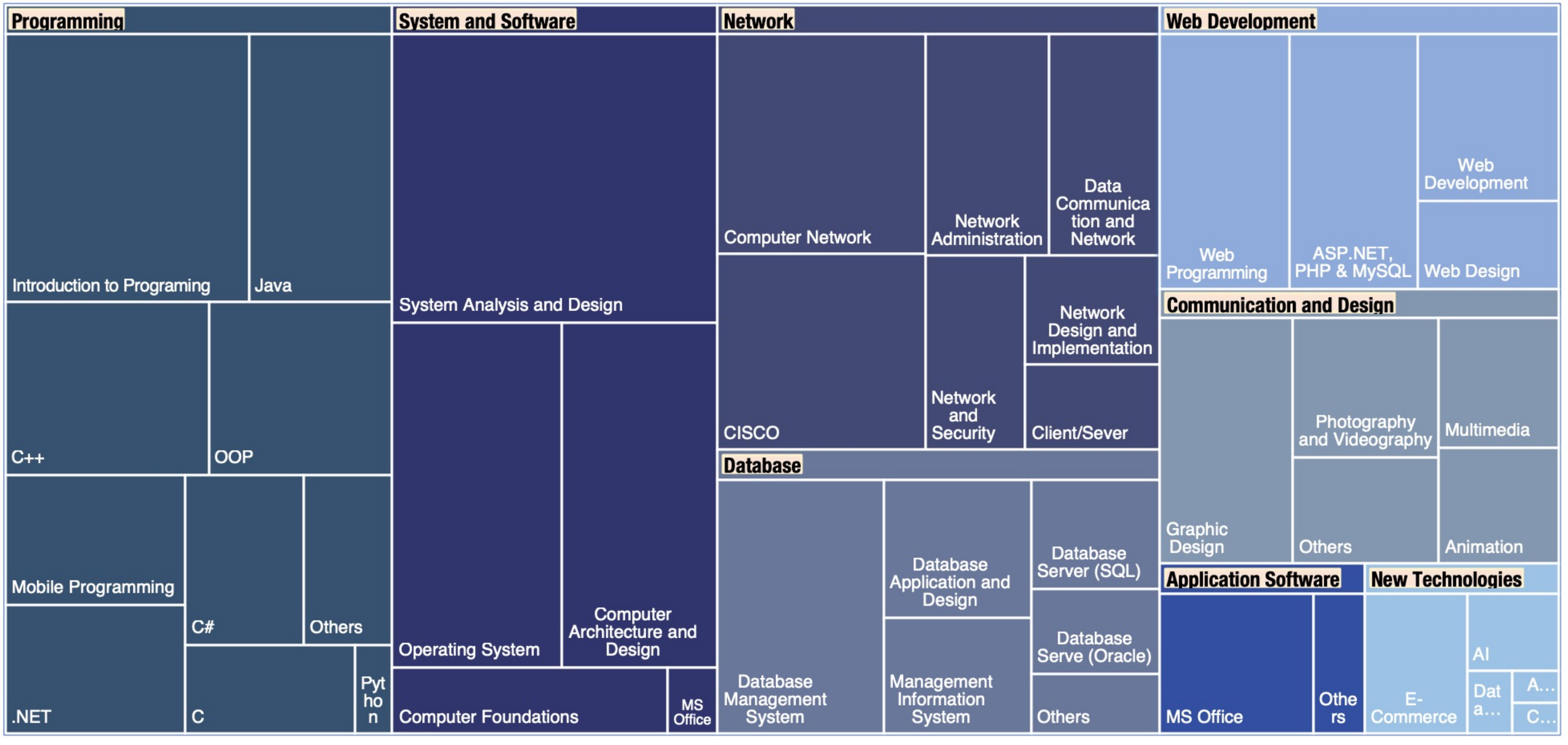
(3) Main findings

Theme 1: (b). Skills supplied

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.

ICT-related curricula at HEI(s)



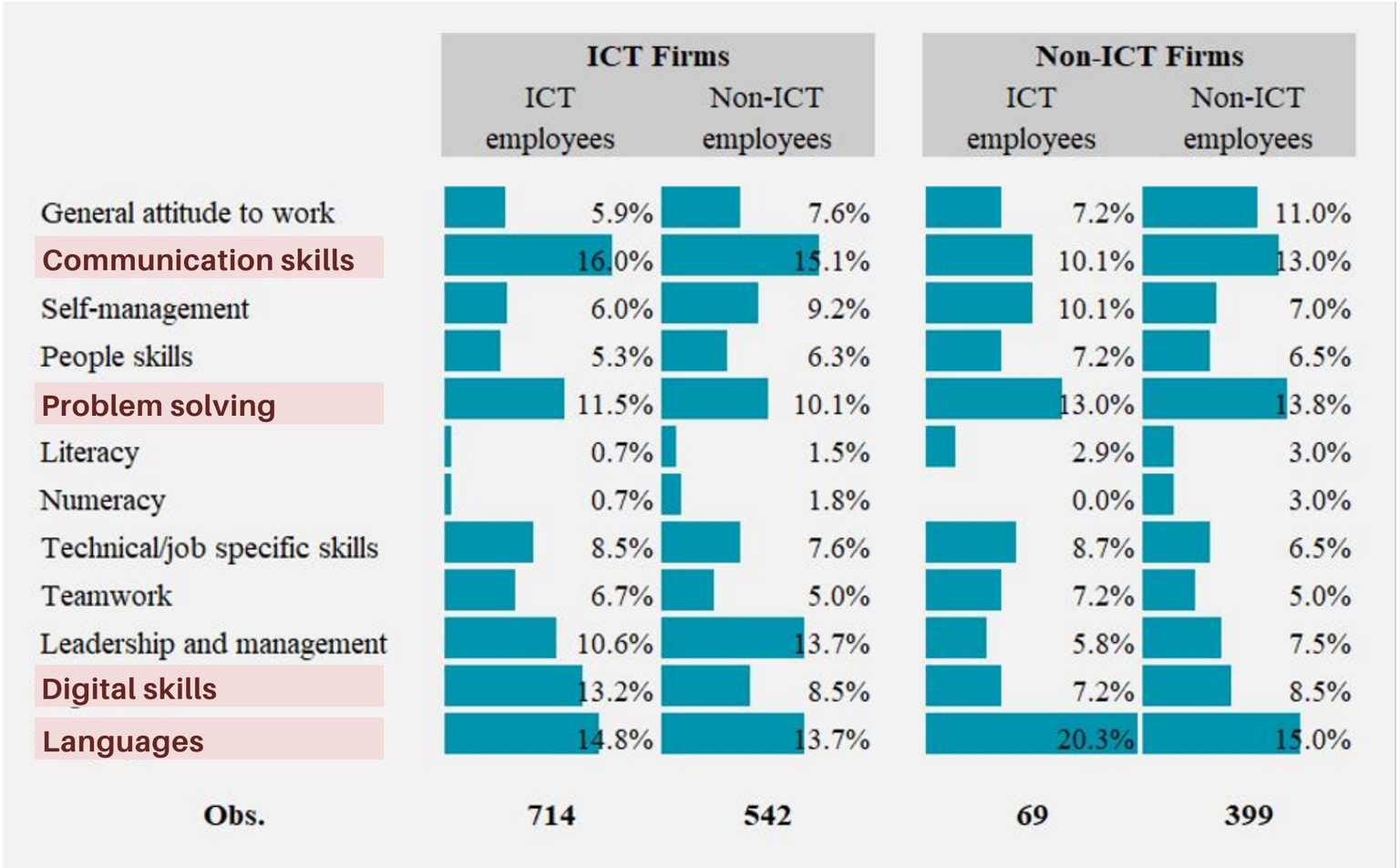
(3) Main findings

Theme 2: Skills mismatch and firms' solution

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

General and digital

General skills gaps reported by the sample firms

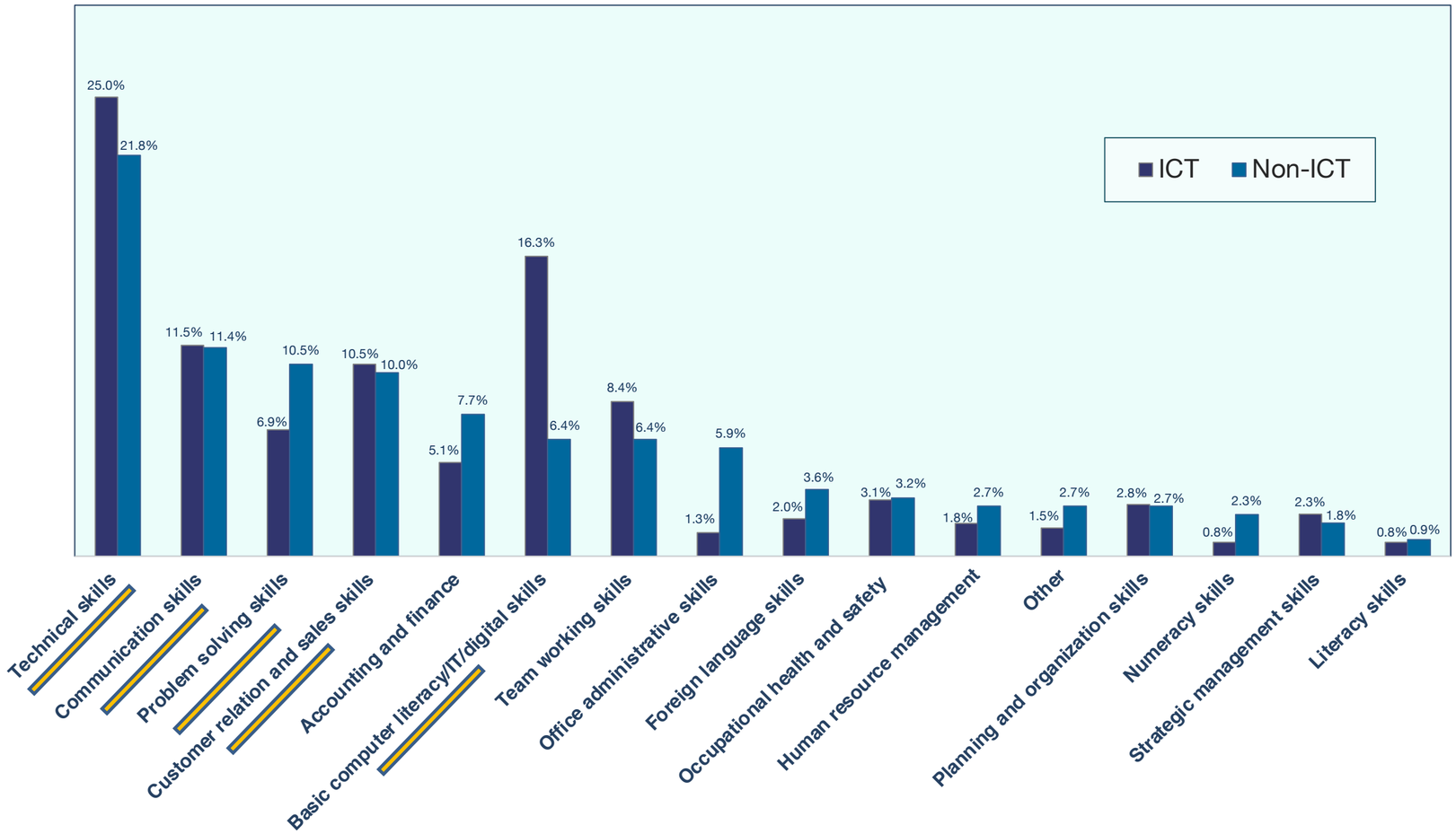


(3) Main findings

Theme 2: Skills mismatch and firms' solution

How did the sample firms deal with the skills gaps?

On-the-job training.



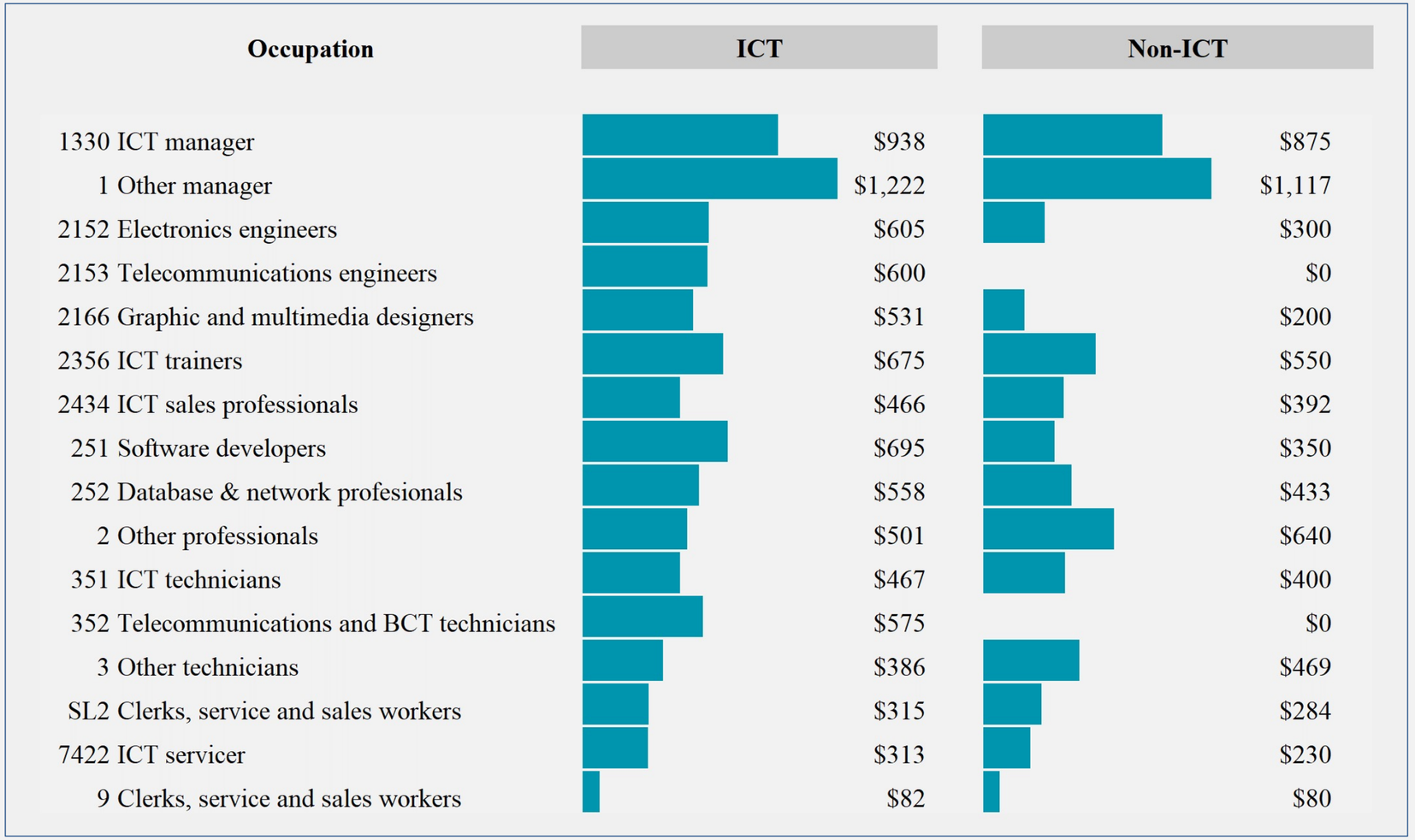
(3) Main findings

Theme 3: (a). Labour market performance of ICT graduates

Average monthly salary (ICT and non-ICT) is around USD450/month.

Average salary in ICT sector is higher than that in non-ICT sector.

Salary of Graduates



(3) Main findings

Theme 3: (a). Labour market performance of ICT graduates

The ICT workforce is growing but dominated by male. The wage premium of ICT majors is estimated to be around 10%.

ATE	(1)	(2)	(3)
	All	Male	Female
IPWRA	0.113**	0.0708	N/A+
	(0.050)	(0.051)	
PSM (nn=5)	0.100**	0.126**	N/A+
	(0.046)	(0.062)	

Note: Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

+ Due to the lack of common support of propensity score.

Source: Authors' calculation.

(3) Main findings

Theme 3: (a). Labour market performance of ICT graduates

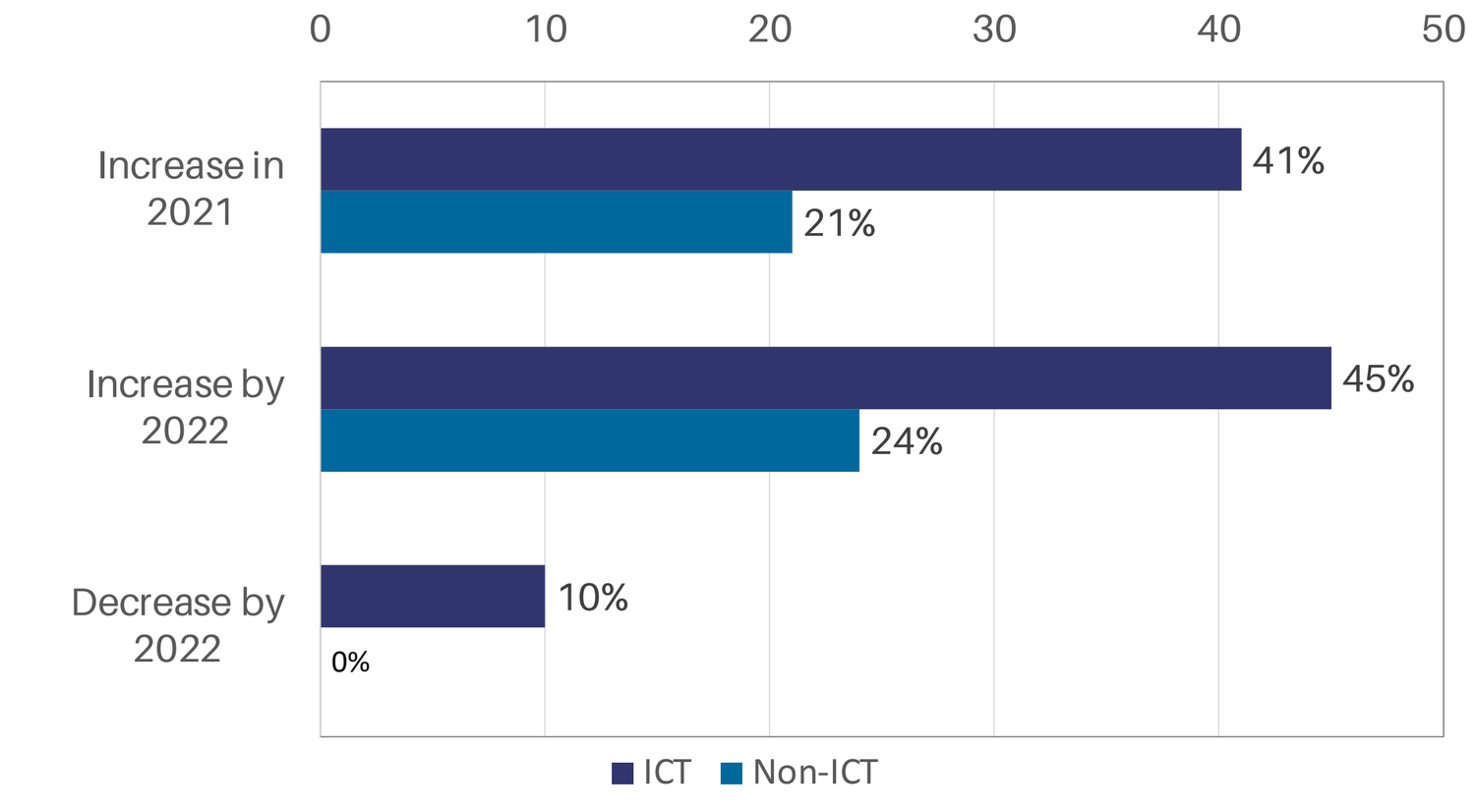
Competitiveness in the labour market, lack of working experience and English proficiency seem to be the forefront concerns of students. They are less concerned about the skill mismatches.

(3) Main findings

Theme 3: (b). Possible future demand for digital skills

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.

A. Average percentage change in ICT employees

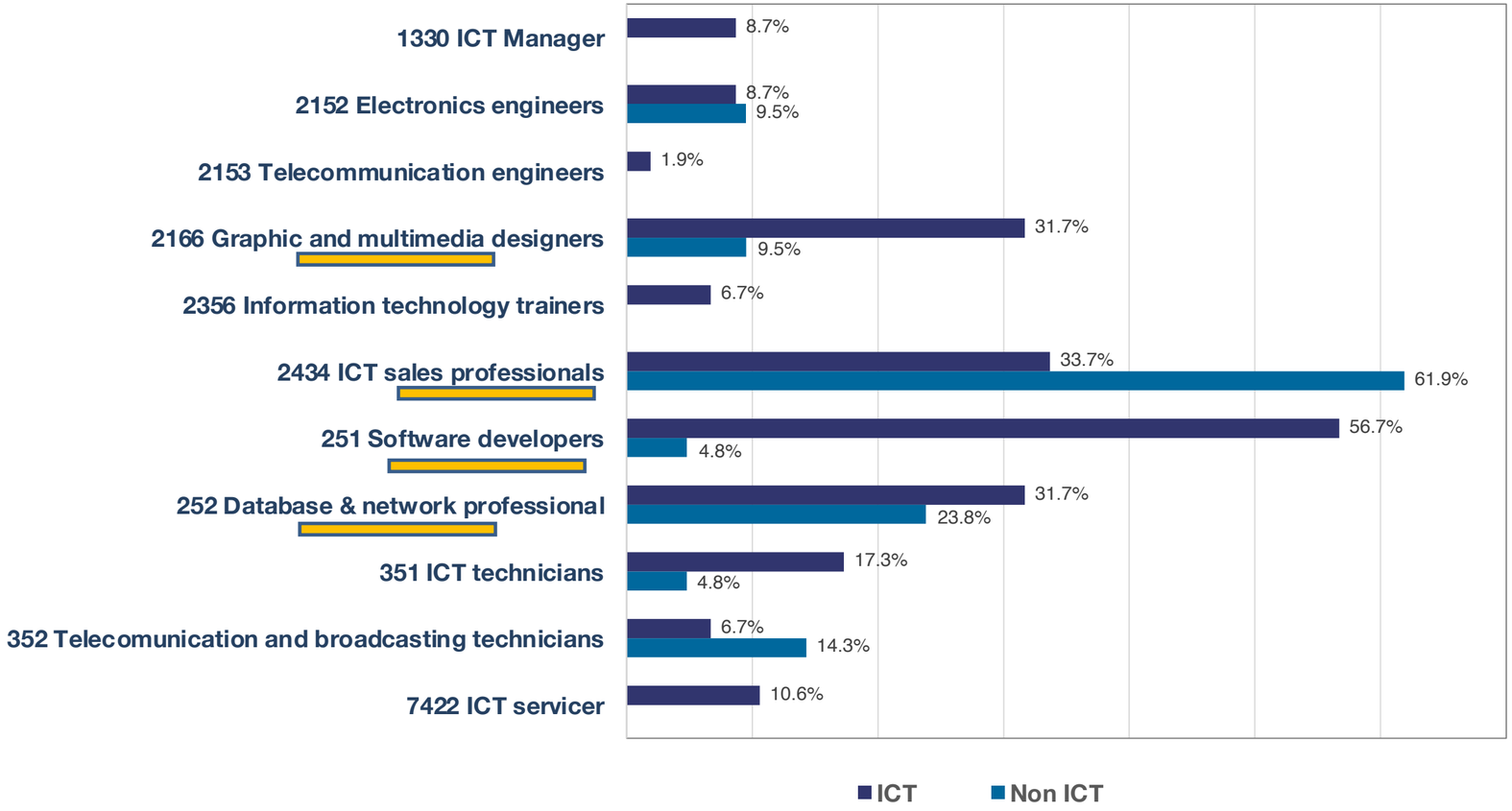


(3) Main findings

Theme 3: (b). Possible future demand for digital skills

Some of the ICT occupations demanded: software developers, ICT sales professional, graphic and multimedia designers and database and network professional.

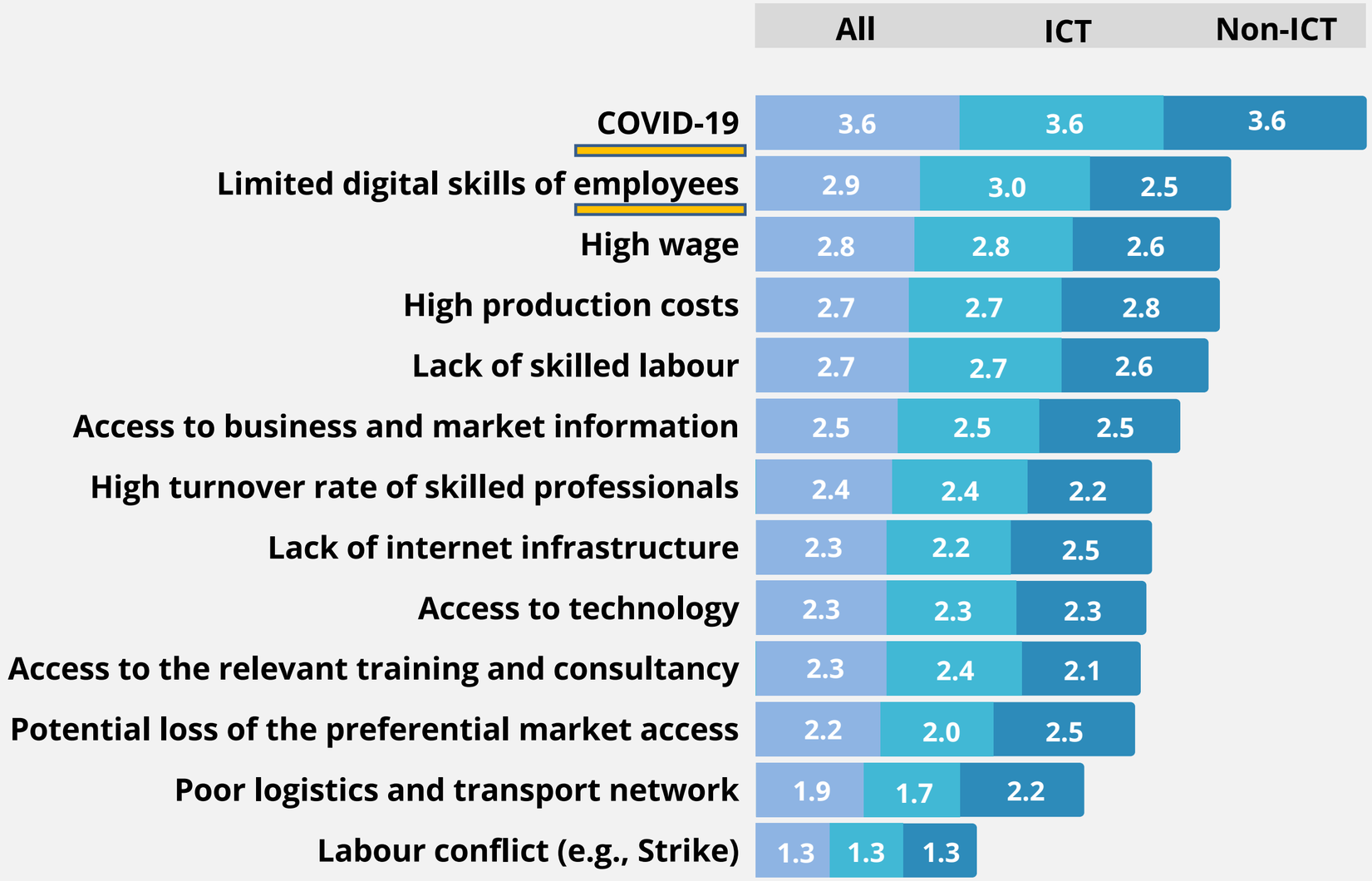
B. Future demand for ICT occupations



(3) Main findings

Theme 4: (a). Covid-19 and tech adoption

The challenges reported by sample firms.



(3) Main findings

Theme 4: (a). Covid-19 and tech adoption

The impacts of COVID-19

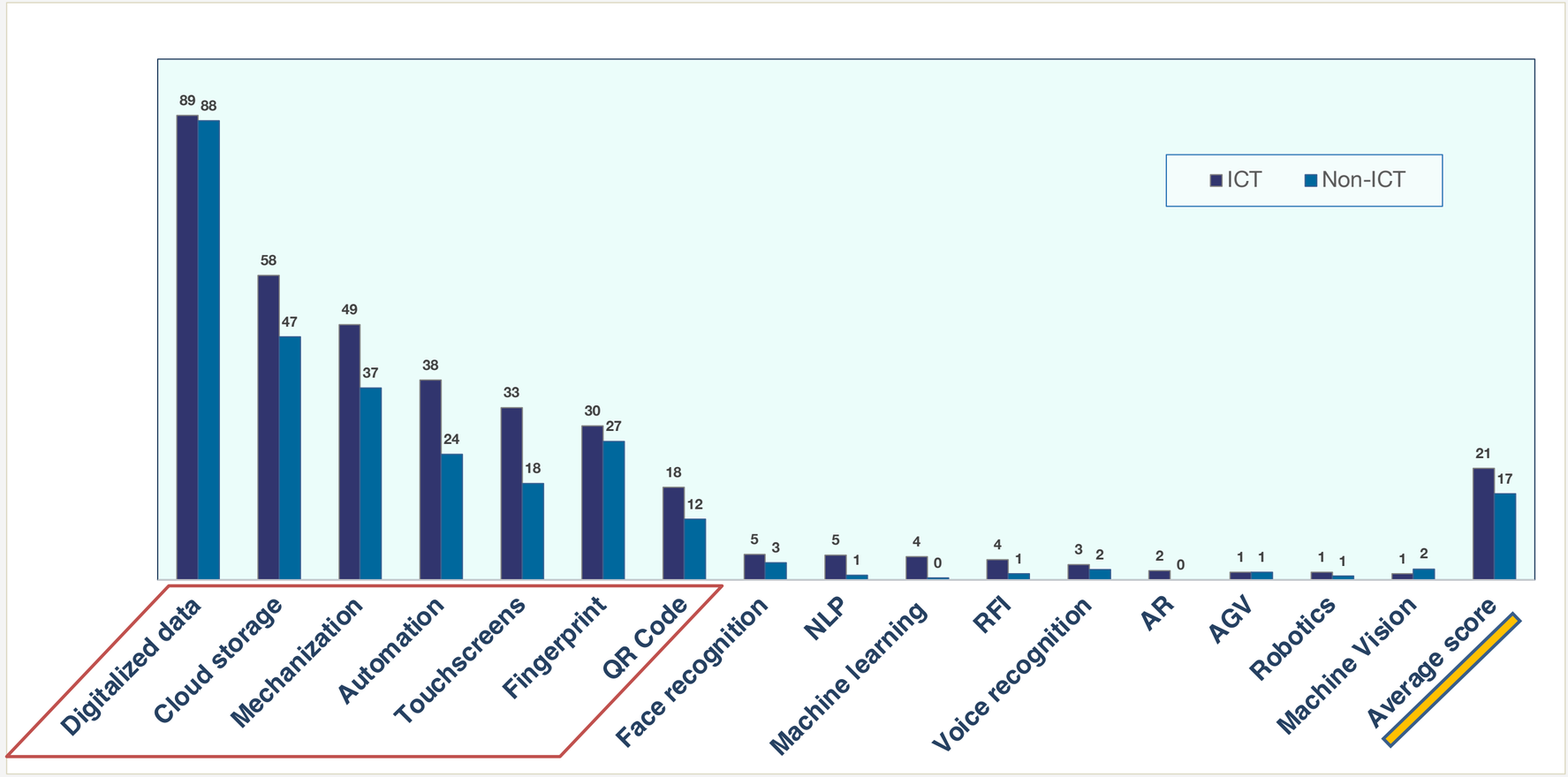
- COVID-19 was reported by ICT and non-ICT firms as the biggest challenge impacting operations and profits.
- There have been adoption of digital technology in response to COVID-19, but not significantly.
- Digital marketing and online sales are the most common.
- Educational institutions and students 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.

(3) Main findings

Theme 4: (a). Covid-19 and tech adoption

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

Firms' use of new technology



(3) Main findings

Theme4: (b). 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.

(4) Main messages

DEMAND SIDE

- The demand for ICT and digital skills is expected to **GROW**. There have, however, been mismatches and shortages of qualified digitally-skilled workforce (ICT included).
- Occupational demand for digital skills: **1** ICT sales professional; **2** software, application and web developer; **3** multimedia and graphic designers (including e-marketing professionals); and **4** programmers.
- Soft skills: inter-personal and communication with colleagues and manager, problem-solving and critical thinking and creative solutions, and English proficiency.
- Firms deal with the ICT and digital skills mismatches and shortages by providing **on-the-job training**.

SUPPLY SIDE

- Tertiary enrolment in STEM majors including ICT remains low, male dominated, and geographically concentrated (Capital).
- Curricular is mainly devoted to general subjects and lacks subjects on new technologies (i.e., machine learning, artificial intelligence, fintech, and data science).
- Lack of subjects devoted to soft skills: critical thinking and problem solving.
- Several challenges HEIs and TVET institutions are facing **1 limited support from the government**, **2 limited financial and human resources**, and **3 uneven ability and preparedness of students who enroll in the STEM programs in mathematics and digital literacy.**

(4) Some recommendations

Government

Strengthen industry-university and university-university linkages (sector skills council for ICT).

Capitalize and equip universities/TVET institutions, particularly ones the provinces

Ensure gender and geographically inclusive STEM education

Better equip students at upper secondary schools with basic digital skills and math competency

Educational institutions (HEIs and TVET)

Consult constantly with employers about their skills needs.

Modernise curricular to include subjects in new technologies (i.e., data science, fintech, artificial intelligence, and cyber security).

Collaborate with employers to provide internship or apprenticeship opportunities to students.

Combine hard and soft skills.

Private Sector

Participate in the sector skills council for ICT.

Work with educational institutions to offer internship and apprenticeship

Continue to provide on-the-job training

Many thanks for your attention.

We are happy to answer questions.