Digital Literacy Assessment

Final Report

Sponsored by

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Content

Detailed Content

EXECUTIVE SUMMARY

This digital skill gap assessment report presents the digital Skill mismatch in capturing the extent to which employers experience difficulties recruiting certain types of digital skill (basic, workplace and advanced) and estimating the extent to which employer's consider their employees to be fully competent or proficient at the jobs they are currently undertaking. Thus, this assessment has been done with aim to:

1. Identify gaps between digital skills required by employers (demand) in selected sectors / locations, and digital skills obtained through formal education, TVET and university levels (supply);
2. Identify barriers and bottlenecks in digital skills provision, as well as map-out existing digital skill education and training offers / providers in both formal and informal education and training system; and
3. Develop first set of recommendations for future digital skills framework based on assessment results.

The three industries selected for this study were Hospitality, Construction and Metal industries. In addition, ministry offices working in digital skill development and education programs, professional associations and teaching/training institutions and those supporting the educational program were included. The findings of the study justifies that in the Hospitality industry work–place and advanced digital skill use has a positive impact on their competitiveness and profitability. There, is a huge desire to improve services by using advanced digital technologies such as Mobile check-ins, geolocation services, special discount application and real-time order at a Bar and restaurant etc. However the assessment has revealed some differences between hotels located in the capital city and outside.

In the Metal industry, Semi-automated machines are in use and are often operated by foreign experts. Basic skills are used for back office and occasionally for designing. The state of digital skill development and the desire to have an automated production process using digital technologies is very minimum. Likewise, in the construction industries, software are used only for designing and back office activities. As a result, there is a visible limitation of using advanced project management software, POS, business intelligence software and often, low level of participation in virtual meetings. Consequently, management cost has surged, frequent delay of project execution is common, and aspiration to be competitive locally and internationally is subdued. Seeing the state and advancement of digital technology, the understanding and the tendency for both sectors to invest and use improved workplace and advanced digital skill technology is at infancy.

Moreover, when we see from Educational Providers or skill supplier's perspective, there is a discrete effort made to catch up with the fast growing digital technology. Here, the assessment has revealed that there is no national digital skill demand and supply survey done yet. Also, there is no clear road map for digital skill policy and most of all there is no coordinated effort among the stakeholders. As a result the digital skill framework is not aligned to match the existing curriculum and not developed with full engagement of the private sector.

Besides, occupational standard is not structured to meet the timely need for digitally skilled workforce and the ICT infrastructure gap exists in all educational sectors. However, the ICT setting in TVET is the most underprivileged one. Dual training role, incentive for private sector and guidelines to engage them in apprenticeship program is not clearly put in place. As a result, hands on practical skills training has been seriously compromised.

Finally, in this assessment, the key area of influence recognized are: timely introduction of digital skill policy, growing investment in training, reviewing the existing curriculum framework, enhancing digital technologies with the right equipment and fully operating network system, and giving young children as school an opportunity to understand the possibilities of a career in digital technologies. Without investment in a digital future, technologies and a coordinated national effort, public and private sector partnerships, creating jobs, developing digitally competent graduates and productive workforce will be far from reach.

In summary, it is worthwhile to act on the findings of this report, not tomorrow but today. Because there is an urgent need for every graduate or workforce to be armed with the right level digital literacy, so they can continue to engage in everyday life, increase their employability, improve productivity, interact and lead life and business at reasonable speed.

ACRONYMS

APC - Adama Polytechnic College

AASTU - Addis Ababa Science and Technology University

ASTU - Adama Science and Technology University

BDIOT - Bahir Dar Institute of Technology

BDPC - Bahir Dar Polytechnic College

CTTI - Catering and Tourism Training Institute

ESC- Educational Standard Center

ETHERNET- Ethiopian Education and Research Network

ERP – Enterprise Resource Planning

GWPC - General Wingate Polytechnic College

GIZ – German Corporation for International Cooperation

HERQA- Higher Education Relevance and Quality Agency

IFC - International Finance Corporation

IOT - Institute of Technology

JIOT: Jimma Institute of Technology

JPC: Jimma Polytechnic College

MiNT- Ministry of Innovation and Technology

MOSHE - Ministry of Science and Higher Education

STEP – Sustainable Training and Education Program

SSA- Sub Saharan African

TEPC – Tegbare-Id Polytechnic College

TVET- Technical and Vocational Education and Training

UNCTAD - The United Nations Conference on Trade and Development

WEF – World Economic Forum

OS- Occupational Standard

WB – World Bank

1. INTRODUCTION

The economic importance of digital skill in creating opportunity for young graduates to find jobs, improve productivity in work places and its potential to influence the future businesses is undeniable. While this is true in advanced economy, and some developing African countries, it is witnessed that the impact of digitisation, robotics and automation in everyday lives of people is growing at exponential rate. However, in countries like Ethiopia, there is a slow move towards digitalisation.

This digital skill gap assessment has been sponsored by GIZ-STEP who tries to ensure, as a partner, the nation can realise its potential through developing digitally skilled and capable workforce prepared for the future of work. As a result, the state and impact of digital skill in selected sectors and locations with respect to demand and supply of skilled man–power, delivery of course curriculum by private and government providers and the role of stake–holders has been studied.

The sectors selected for this study were from the emplyers side, hospitality, construction and metal industries. Whereas, from the Supply side, universities, TVET and private educational institutions. In addition, institutions engaged in development of curriculum, designing educational strategy, implementers of quality in of education including ministry offices working in the same area were interviewed.

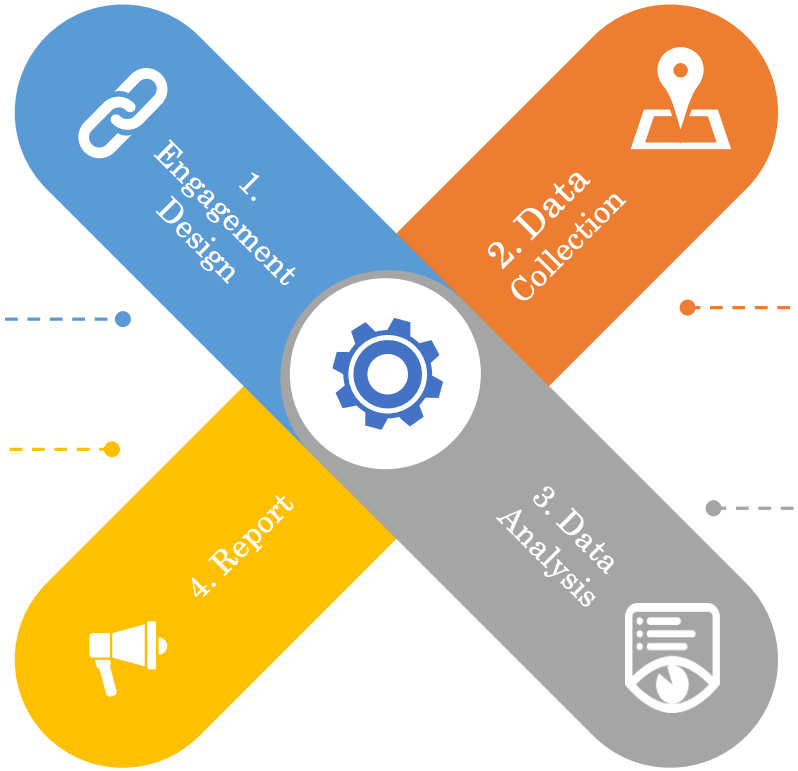
The approach used to conduct the assessment was through interviewing potential survey respondents selected upon the recommendation of GIZ. This study was conducted in four cities, namely Addis Ababa, Adama, Bahir-Dar & Jimma. The assessment has reviewed and realized the importance and impact on digital economy, and identified skill divide or variations with respect to sampled industries and locations

The detailed assessment report is put together in 4 sections: Section 1 presents executive summary of the assessment, where it summarises the whole of the study, Section 2 shows the Methodology used, industries selected including stakeholders, Section 3 shows all findings in graphical presentation with description of the result and Section 4 presents the concluding part of the assessment with brief discussion and recommendations.

2. METHODOLOGY

PROJECT PHASES

The team designed the approach to be used to effectively conduct the digital skills gap assessment. Survey questionnaires and interview questions were developed. Potential survey respondents and interviewees were contacted.



Input Data for the gap assessment was collected from four cities – Addis Ababa, Adama, Bahir Dar & Jimma – using the instruments that were designed prior.

A report expounding on key information elicited from the analysis with sets of recommendations is prepared as a final deliverable of the assessment.

The collected data was analyze and converted to charts, tables and graphs to describe the status and gaps of digital literacy in the selected sectors.

INSTRUMENTS USED

- Desk Research
- Survey Questionnaire
- In-depth Interview

TARGET GROUP

EMPLOYERS

Hotels in Addis Ababa	4
Construction Companies in Addis Ababa	4
Metal Companies in Addis Ababa	4
Hotels in Bahir Dar	4

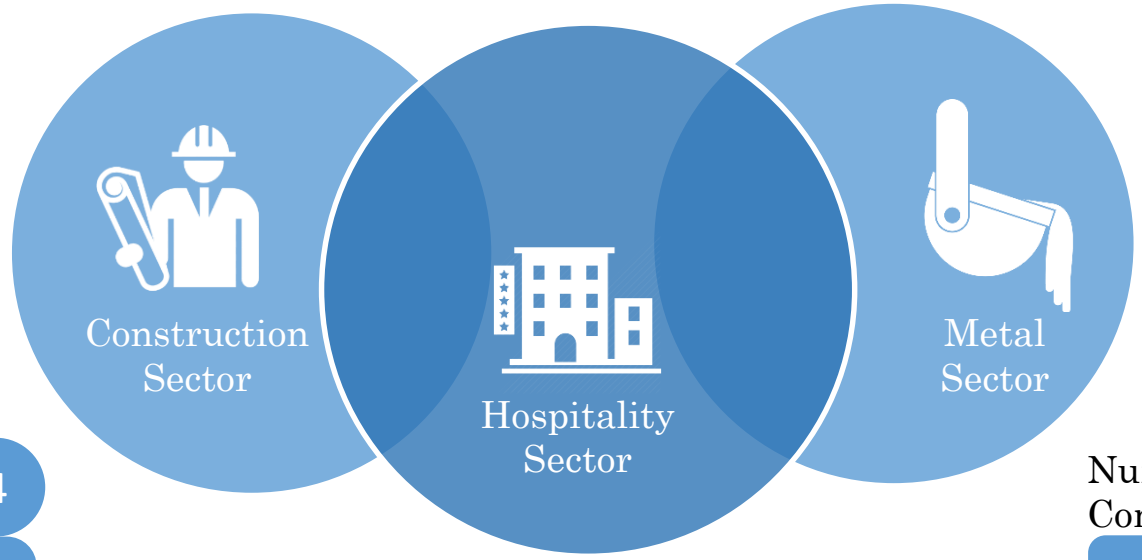
EDUCATIONAL PROVIDERS

Science and Technology Universities	2
Institutes of Technology	2
TVET Colleges	6

OTHER ACTORS

Sectorial Associations	3
Africa 118	
ETHERNET	
HERQA	
MiNT	
HESC	
MOSHE	

CHARACTERISTICS OF PARTICIPANT FIRMS



Number of Companies: 4

3 Local Owned Private Firms
1 Government Institution

Years in Operation

1-5 Years	6-10 Years	>10 Years
1	1	2

Number of Employees

1-100	101-250	>250
1	1	2

Number of Companies: 8

All local owned private companies

Years in Operation

1-5 Years	6-10 Years	>10 Years
6	1	1

Number of Employees

1-100	101-250	>250
2	1	1

Number of Companies: 4

All Local Owned Private Firms

Years in Operation

1-5 Years	6-10 Years	>10 Years
0	0	4

Number of Employees

1-100	101-250	>250
2	1	1

EDUCATION INSTITUTIONS

SCIENCE & TECHNOLOGY UNIVERSITIES

- Addis Ababa Science & Technology University
- Adama Science and Technology University

INSTITUTES OF TECHNOLOGY

- Bahir Dar Institute of Technology
- Jimma Institute of Technology

TVET COLLEGES

- Tegbareid Polytechnic College
- General Wingate Polytechnic College
- Catering and Tourism Training Institute
- Adama Polytechnic College
- Bahir Dar Polytechnic College
- Jimma Polytechnic College

DEFINITION OF DIGITAL SKILL CATEGORIES

Based on international experience, we have categorized digital skills as follows:

BASIC DIGITAL SKILLS

Digital skills employees need to acquire as a foundation for employment in any sector. They are also digital skill sets employees need for the purpose of operating ICT devices, software, searching for data & information as well as sharing them with other through basic digital technologies.

- Operate Computers and Basic Office Machineries (Printers, Scanners, Projectors, etc)
- Use MS Office applications (e.g. MS Word, Excel and PowerPoint) to create simple digital content such as text, spreadsheets, presentations)
- Search for, collect, store data and process information using ICT (e.g. offline, online/Internet);
- Create personal and professional accounts online and interact with others (Eg. Emails, Social Media,
- Collaboration Sites) Protect digital devices and personal data (eg. Antiviruses, Passwords)

WORKPLACE DIGITAL SKILLS

Digital skills that involve operating sector specific digital technologies for the purpose of smoothly performing regular and periodic tasks/duties in an organization.

- Operate Sector Specific Software (Eg. Hotel Management Systems, AutoCad, CNC Programs, CATIA, etc….)
- Use MS Office applications (e.g. MS Word, Excel and PowerPoint) to undertake calculations, data analysis, create databases and professional standard presentations)
- Use Project Management Software (Eg. Cost & Inventory Control, MS project)
- Apply Digital Marketing Tools (Social Networking, SEO, Updating Websites etc..)
- Process customer transaction (by using Point of Sales System (POS)
- Participate in Virtual Meeting (Eg. Webinars, online conferences)
- Use Business Intelligence Software (Eg. SAP, Micros)

ADVANCED DIGITAL SKILLS

Digital skills that are require application beyond workplace, to create, improve and maintain digital technology.

- Create a Website
- Create and Maintain a Computer Network
- Undertake Programming for Software and Application Development
- Configure or Modify Firewall and Security Settings of Digital Devices
- Design, Create and Modify Databases with a Computer Tool
- Create or Design Cloud Computing Solutions

3. FINDINGS

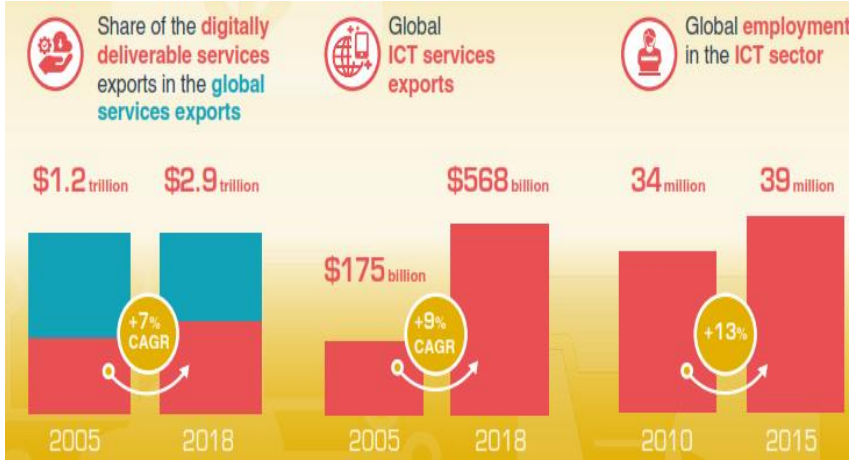
3.1. DESK RESEARCH

This section addresses the latest insights on Digital Skills, Digital Economy and Initiatives focusing on global, continental and local scenarios concisely.

According to digital economy report (UNCTAD 2019) :

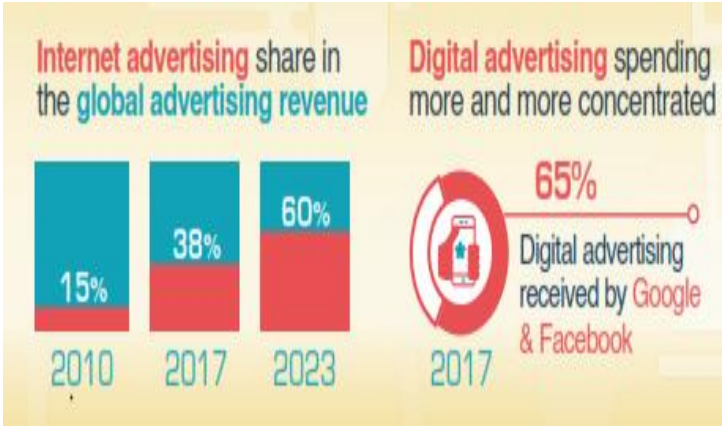
- There is growing importance of digitalization in the global economy.
- More than half of the global population has access to technology in 2019, compared to 30% in 2010.
- Nearly 65% of world population have access to mobile phones. These shifts are reshaping the skills people will need to access markets, operate factories, or run their own businesses in the future.

As depicted below, global share of digitally deliverable service, global ICT export and employment in ICT sector has shown increasing trend



Source : Global Digital Economy (UNCTAD, 2019)

There is growing trend of using digital platforms use for global advertisement.



Source : Global Digital Economy (UNCTAD, 2019)

Brief summary of digitalization, digital economy, digital skills features in selected African countries is presented hereafter:

According to digital economy report (UNCTAD 2019): -

- Africa's share of global digital economy is 1.3%.
- SSA has 22% of internet penetration and 44% mobile penetration.
- Only 50% of countries in Africa have computer skills in their curriculum for education from KG-University, compared to 85 percent globally.
- Without growth in digital skills, Africa's economies will falter in the future.
- Africa's current status shows availability of huge potential for growth.

The number of mobile subscribes, internet users, and active social media users in selected African countries are presented on the following table:

Parameters for Comparison	Selected Countries in Africa					
	Ethiopia	**Kenya**	**Ghana**	**South Africa**	**Egypt**	**Nigeria**
Total Population	107m	51.58m	29.78m	57.7m	100.3 m	198.4m
Urban Population Rate	21%	27%	56%	67%	43%	51%
Mobile Subscription Rate	39%	91%	130%	169%	93%	75%
Internet Penetration Rate	16%	84%	34.6%	55%	49%	49.60%
Active Social Media Users Rate	5.70%	16%	19.5%	40%	40%	12%

Source : Global Digital (Hootsuite , 2019) ; Performance Report (Ethio telecom, 2019), ITU 2019

According to IFC 2019 report:

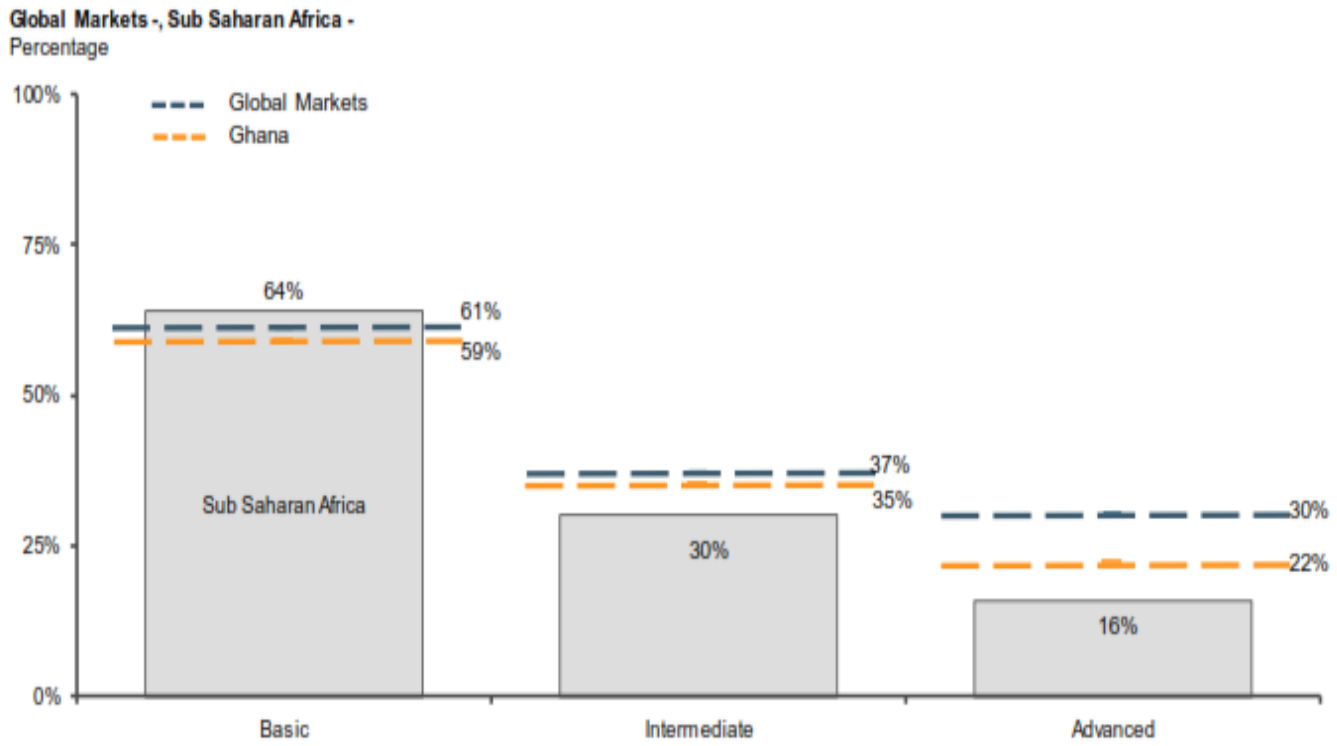
- About half of the current jobs in Africa require some level of digital skills.
- Over 230 million jobs in SSA will require digital skills by 2030, resulting in almost 650 million training opportunities.
- An estimated $130 billion investment on trainings opportunity exists to provide digital skills across SSA until 2030.
- The market for digital skills across SSA over the coming decade is significant
- Demand for digital skills is expected to grow at a faster rate in the region than in other global markets.
- A significant gap in supply and demand exists across all levels of digital skills in the region.
- Short courses are ideal, typically 3 to 12 months long, with a mix of instructional methods geared toward practical learning rather than theoretical understanding.

Digital skills requirements and selected initiatives in Africa

- As the demand for digital skills are becoming critical, a number of African countries have introduced several measures. For example:
  i. In Ghana, ICT Education is integrated in the curriculum starting from foundational level.
  ii. In Kenya, among other initiatives, Government of Kenya Presidential Digital Talent Program has been introduced. It is 12 month on-the-job training program targeting fresh graduates from both public and private universities. It is coordinated by MICT of Kenya in partnership with public and private stakeholders
- Reports suggest that, the digital skills challenge in Sub-Saharan Africa is significant, but it is addressable.
- Digital skill courses are identified as critical to enhance graduates' employability. Offerings should align with market demand and employer requirements to ensure students gain the technical and soft skills required by the industry.

The following barograph shows digital skill requirements by levels: comparison is made considering global market, SSA and Ghana as an example

Proportion of Digital Recruits Requiring at Least the Stated Level of Digital Skills -



Source : Digital Skills in SSA spotlight on Ghana (IFC / The WB report , 2019)

Digital skills requirements and selected initiatives in Ethiopia

Ethiopia is relatively lagging behind many African countries in terms of internet penetration, and readiness to use digital technologies benefitting from the growing digital economy, etc.

However, such scenarios are slowly changing. According to Homegrown economic reform agenda (2019), Ethiopia is aspiring to build inclusive digital economy through:

- Expediting the telecom reform agenda and ongoing work on digital ID system;
- Sandbox regulatory approaches to support technology start-ups and incumbents;
- Scaling up ongoing government ICT initiatives such as *e-governance, WoredaNet, the rural connectivity program,* and *rural public internet access centres;*
- Promoting e-commerce and digitization of the financial and logistic sectors;
- Developing ICT parks and fostering the development of the ICT ecosystem;
- Investing on ICT literacy and advanced vocational and tertiary education.

Review of Ethiopia's upcoming ten years perspective plan also aspires to build a resilient and diversified middle income-level economy that is going to be achieved through, among other things:

- Diversification, technological upgrading, and innovation
- Building inclusive digital economy

Similarly, review of documents from Ministry of Innovation and technology show that the Ministry is working on various initiatives such as:

- The digital literacy initiative (the proposal is completed), which aspires to make 70% of the population digitally literate in 2025 .
- Establishment of "Electronic World Trade Platforms" (Memorandum of understanding was signed with Alibaba Group)
- Strategic plan on digital certification for ICT professionals from 2018-2022
- *eGovernment* Strategic Implementation Plan 2020 (developed by KPMG East Africa).

Ethiopian Science, Innovation, and Technology (MiNT) Policy which has been in use for the last 8 years was revised with the involvement of experts from Ethiopia and abroad.

The revised policy brief (not yet approved) focuses on:-

- The need to create a strong link between industry and skills of graduates in natural science and engineering disciplines
- Building digital economy platforms such as e-government and e-taxation;
- Supporting manufacturing export of firms (ensuring their competitiveness) through technology.

There are comprehensive initiatives to support the digitalization ambitions of Ethiopia. For instance, MiNT has announced the following national level initiative: 2,2,2,2 Strategy.

Source: http://www.mcit.gov.et/

According to Ethiopian Educational Development Roadmap (2018-2030):

- There is serious disparity in terms of quality and relevance of TVET & university education.
- During the development of occupational standards (OS), attempts were made to engage major stakeholders. Nevertheless, the number of OS has grown from 600 to 800 which is more than occupational standards recognized by ILO. This is partly due to development of micro occupations that are not actually serving skill needs of industries in the country.
- Cooperative learning largely remained unstructured, not sufficiently contextualized, did not indicate clear incentive & motivation for industry to participate.
- There is poor participation and ownership of industry both in cooperative training and COC assessment;
- There is greater infrastructure limitations in educational institutions
- Weak skills training alignment with the national economy and workforce needs;

In general, review of various national policy documents and initiatives in Ethiopia clearly indicates that :

- A growing attention for digitalization and building inclusive digital economy.
- To be successful in the achieving the plans set, it is essential to integrate ICT with the entire educational system in the country.

THE 4TH INDUSTRIAL REVOLUTION

The Fourth Industrial Revolution can be described as the advent of "cyber-physical systems" involving entirely new capabilities for people and machines. While these capabilities are reliant on the technologies and infrastructure of the Third Industrial Revolution, the Fourth Industrial Revolution represents entirely new ways in which technology becomes embedded within societies and even our human bodies. Examples include genome editing, new forms of machine intelligence, breakthrough materials and approaches to governance that rely on cryptographic methods such as the block chain.

The possibilities of billions of people connected by mobile devices, with unprecedented processing power, storage capacity, and access to knowledge, are unlimited. And these possibilities will be multiplied by emerging technology breakthroughs in fields such as artificial intelligence, robotics, the Internet of Things, autonomous vehicles, 3-D printing, nanotechnology, biotechnology, materials science, energy storage, and quantum computing.

On the whole, there are four main effects that the Fourth Industrial Revolution has on business—on customer expectations, on product enhancement, on collaborative innovation, and on organizational forms. Whether consumers or businesses, customers are increasingly at the epicenter of the economy, which is all about improving how customers are served. Physical products and services, moreover, can now be enhanced with digital capabilities that increase their value. New technologies make assets more durable and resilient, while data and analytics are transforming how they are maintained. A world of customer experiences, data-based services, and asset performance through analytics, meanwhile, requires new forms of collaboration, particularly given the speed at which innovation and disruption are taking place. And the emergence of global platforms and other new business models, finally, means that talent, culture, and organizational forms will have to be rethought.

Given the nature of the 4IR, what African entrepreneurs require is for governments to help build the knowledge economy. Government investment in the African knowledge base is sorely needed, as it may be argued that the most serious (but not only) constraint to African entrepreneurs' making use of the opportunities of the 4IR, and which exposes workers to being replaced by automation, is the lack of skills and education. The need for schooling and re-tooling of the African labor force to find occupations less susceptible to automation, needs more recognition.

Source: WEF, 2019 (https://www.weforum.org/agenda/2016/01/what-is-the-fourth-industrial-revolution/
Entrepreneurship, Education and the Fourth Industrial Revolution in Africa, Wim Naudé, IZA Institute of Labor Economics

3.2 ASSESSMENT: EMPLOYER'S PERSPECTIVE

A. HOSPITALITY SECTOR

i. Technologies Used and Perceived Impact

Technologies Used

- All
- All
- All
- All
- All
- All
- All

Digital tools and technologies used

Commonly used digital technologies among most hotels in Bahir Dar and Addis Ababa:

- Computers, tablets , internet, POS machine, Portable devices
- Digitally operated laundry machine
- Digital marketing platforms, Social media platforms
- Software for hotel operations such as CNET (locally produced software), locally developed ERP
- Peachtree (and other accounting software)

Additionally used digital technologies among most star and brand hotels located in Addis Ababa:

- CCTV camera, Scanner machine
- Biometric attendance , Digitally controlled gates and door access
- IDS and/or OPERA (full package software including HR and Revenue and Inventory Management Systems)

Digital Technologies to be used

International branded hotels and five star hotels have plan to use :

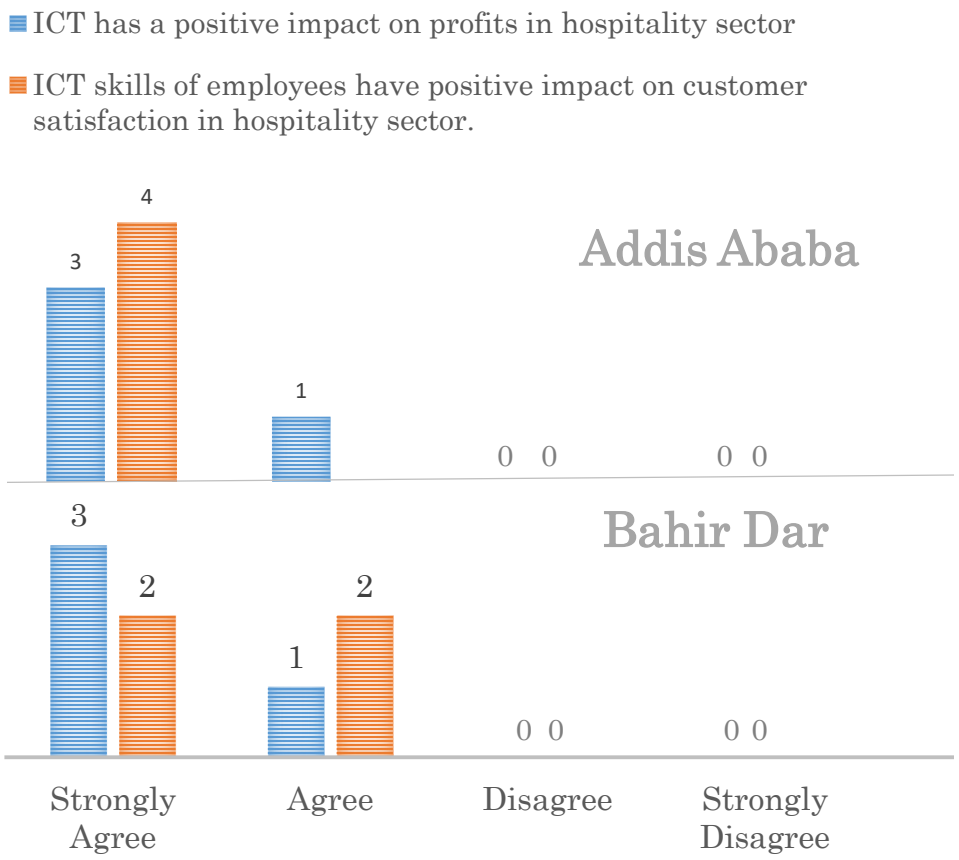
- Mobile check-ins and geo-location to special discount application
- Digital menu for real-time order at bar and restaurant
- Real-time customer satisfaction assessor machine

Remark on digital technology use

Based on interview responses obtained from hotels managers:

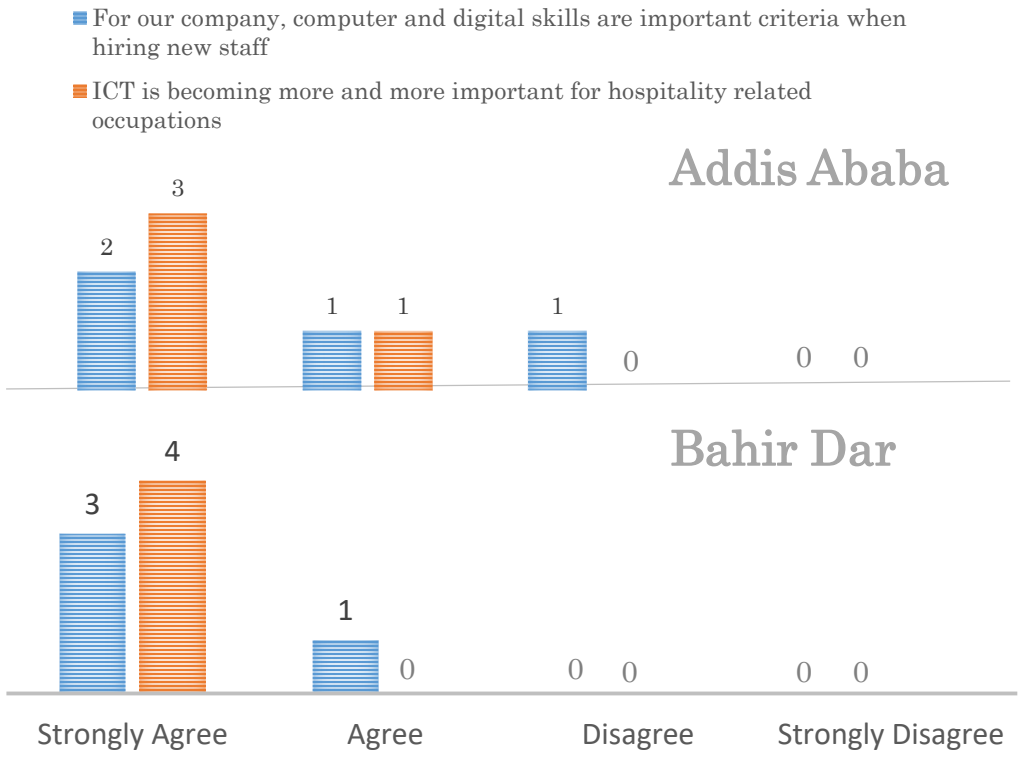
- Hotels are slowly realizing the positive impact of using digital technologies.
- There is growing interest to use full package authorized software to improve profitability, competitiveness, and customer service .
- Based on interview responses, in international branded hotels entering the hotel industry market, the need for digital technology use among four and five star hotels specially in Addis Ababa is increasing
- Use of CNET software in Addis Ababa is almost replaced by IDS and OPERA among branded and star hotels.
- CNET software is used among hotels at Bahir-Dar
- There is a strong & growing competition among hotels in the use of digital skills which is leading employers to potch employees of other hotels.

PERCEIVED IMPACT OF ICT ON PROFITABILITY & CUSTOMER SATISFACTION

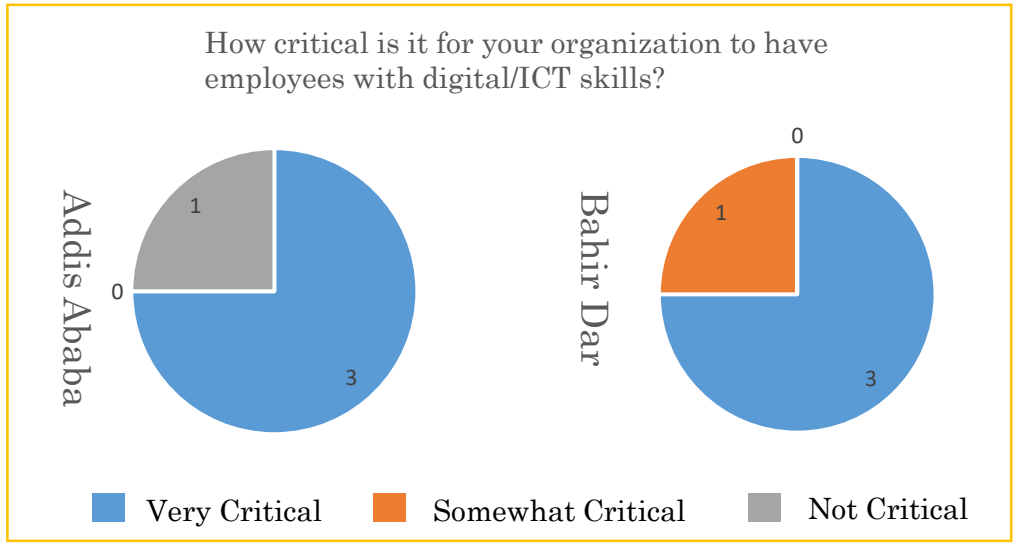


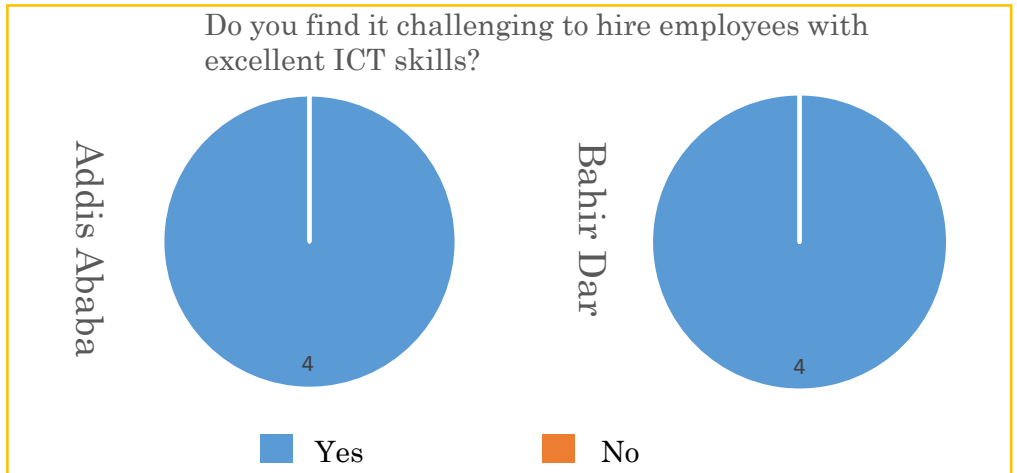
All respondents have positive views on the effects of ICT on profits and customer satisfaction in the hospitality sector. As a result, they believe that ICT plays important role for their businesses.

ii. Digital Skills and Hospitality Jobs (Occupations)



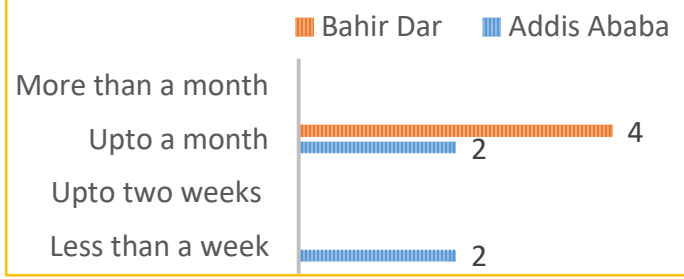
Most respondents agree that ICT is becoming more and more important for hospitality related occupations and digital skills are important criteria when hiring new staff.





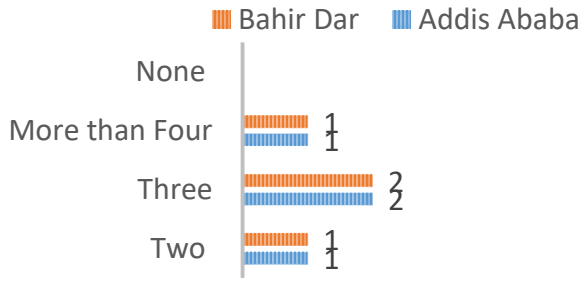
All respondents said that they find it challenging when hiring new staff. High salary demand has been cited as the main reason in Bahir Dar and lack of demanded skills among new recruits in Addis Ababa

ON AVERAGE, HOW MUCH TIME DO YOU TAKE TO HIRE NEW EMPLOYEES WITH DIGITAL/ICT SKILLS?



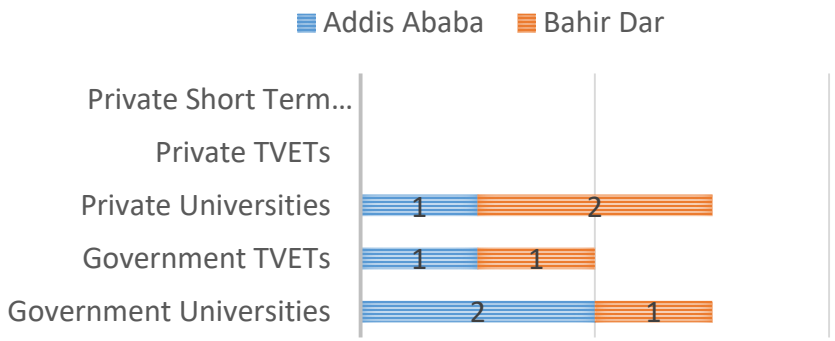
On average, employers take from a week to a month to hire employees with Digital/ICT skills.

HOW MANY VACANCIES WITH REQUIREMENTS FOR DIGITAL AND COMPUTER SKILLS DID YOU ADVERTISE IN THE PAST 6 MONTHS?



The number of vacancies with requirements for ICT skills, the respondents in Addis Ababa and Bahir Dar advertised in the last 6 months is identical. Half of them have done it three times.

FROM WHICH EDUCATION/TRAINING PROVIDERS DO YOU USUALLY HIRE GRADUATES WITH BETTER DIGITAL/ICT SKILLS?

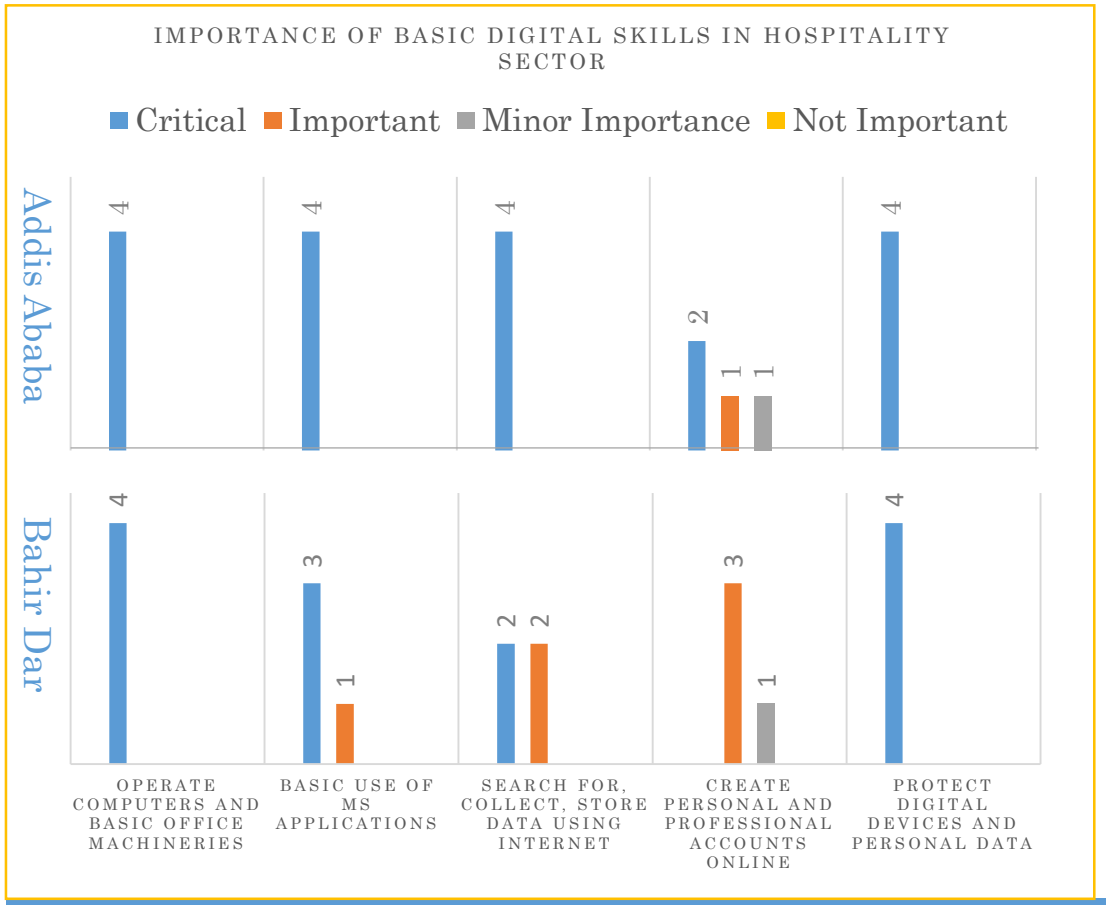


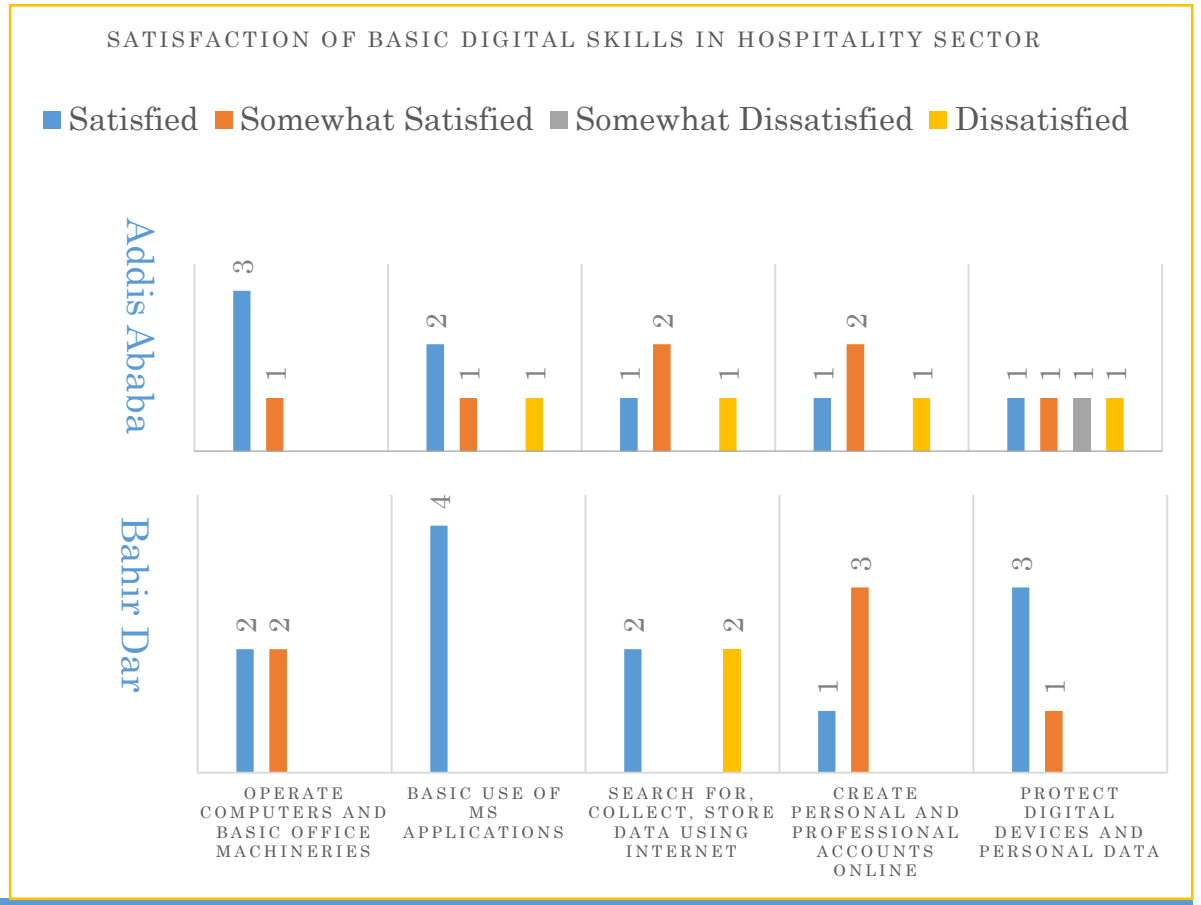
Hotels in Addis Ababa prefer recruits from government universities the most for ICT skilled employees while Bahir Dar hotels prefer Private University recruits.

The use of digital skills at five stars and branded hotels is becoming more and more critical. These days almost all positions are demanding various digital skills.

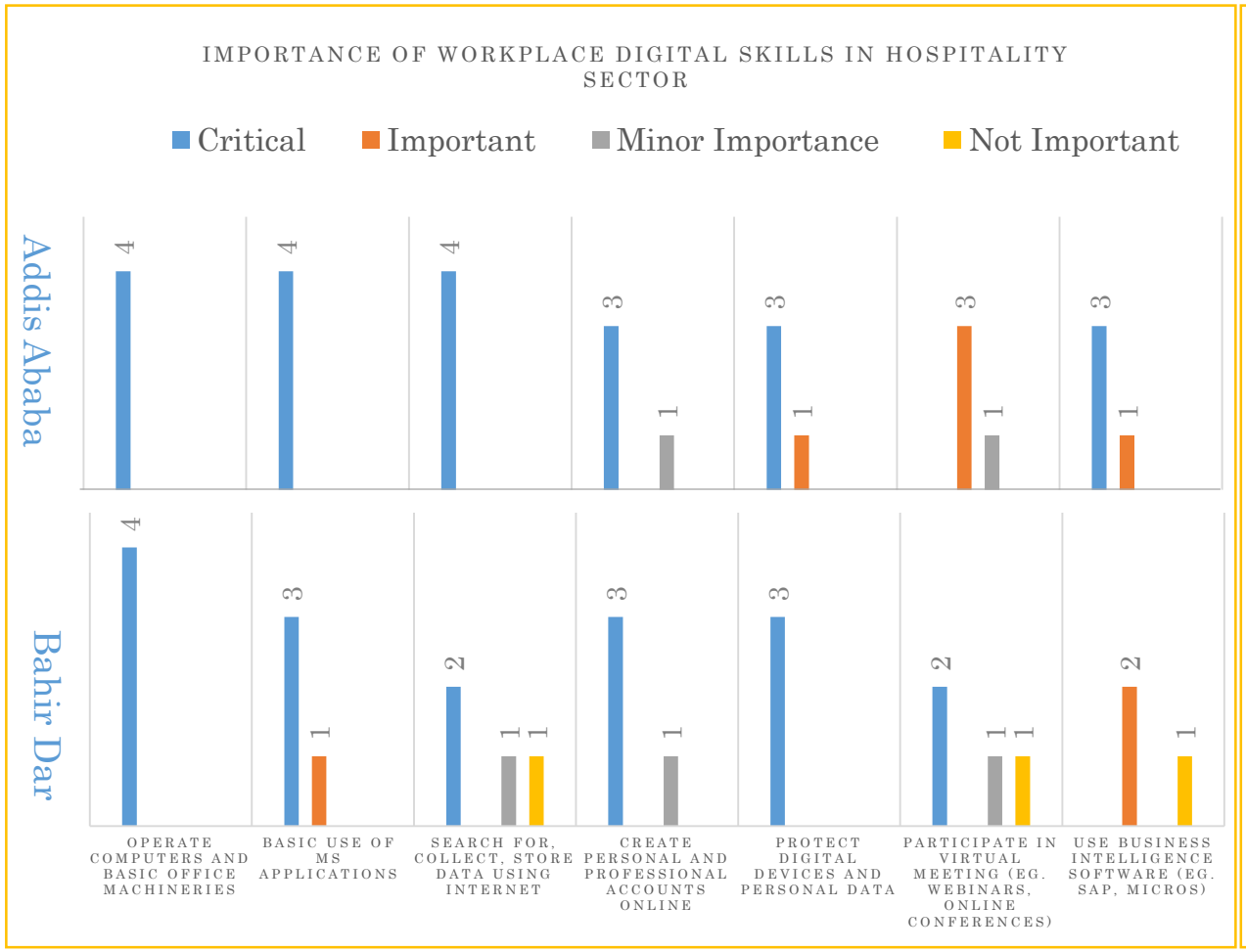
Digital skills requirements across various job positions among five star and branded hotels				
Managers / Department Heads / Supervisors	Front Office Operation Positions (waiter/ress, receptionist, and others)	Back Office Operation (food & beverage, check-in, housekeeping, laundry and others)	Marketing, HR, Finance, Inventory, Maintenance, ICT, and other	Safety & Security
▪ Generally, basic, workplace, & advanced digital skills are required. ▪ Effective MS office packages ▪ Effective use of social media, email & organizing video conferences ▪ Ability to effectively use software such as IDS, OPERA & CNET . ▪ Handling digital tools and fixing easy problems (troubleshooting) ▪ Ability to train & coach other employees on the use of digital technologies	▪ Basic computer and workplace skills are mostly required ▪ Use of MS offices ▪ Handling online communication (Online booking, responding to emails professionally from within and out) ▪ Online discount computation ▪ Handling online check-ins and checkouts services , computing discounts using CNET/ IDS / OPERA ▪ Use of POS machines ▪ Handling online payments ▪ Handling digital tools and fixing easy problems (troubleshooting)	▪ Basic digital skills ▪ Operating digital tools used in offering services. For instance in house keeping and laundry ▪ Use of CNET/ IDS / OPERA system applicable to these services ▪ Use of Peachtree & other applicable accounting software	▪ Use of MS office packages ▪ Handling mostly internal emails ▪ Conducting video conferences ▪ Use of Sun System, HR information system, ERP system, material control system, property management system ▪ Use of digital marketing platforms , graphic design, web design, Search Engine Optimization, sharing periodic magazines online	▪ Effective use of CCTV camera ▪ Effective use of scanning machines for security ▪ Use of biometric attendance

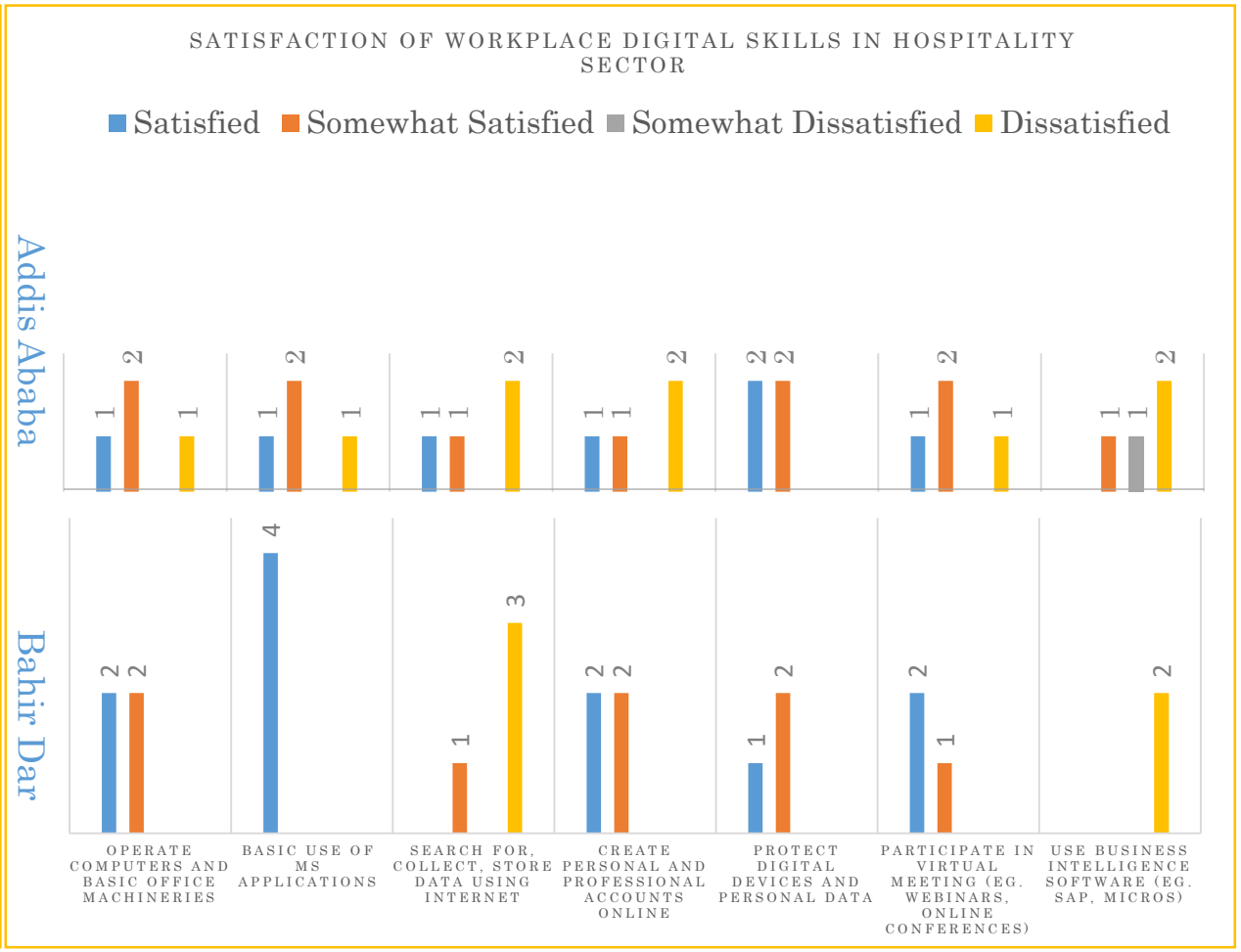
iii. Digital Skill Levels Importance & Satisfaction in the Hospitality Sector



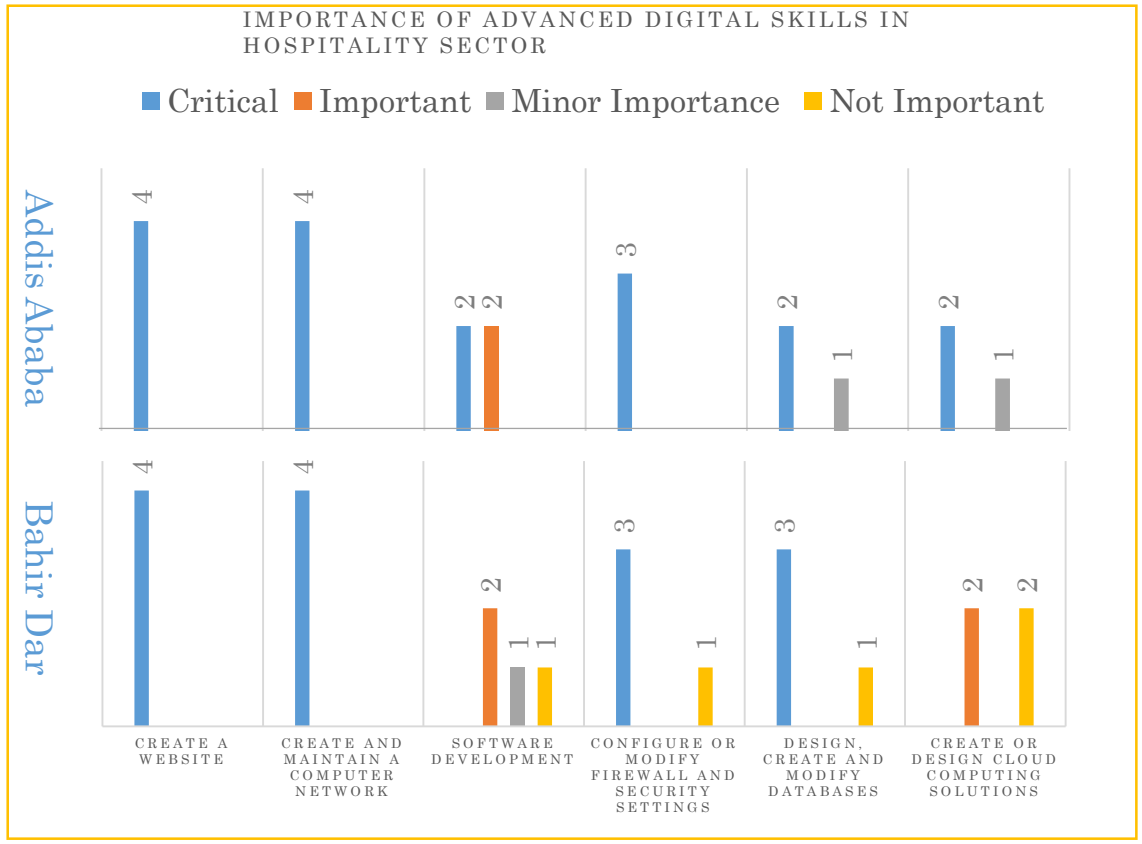


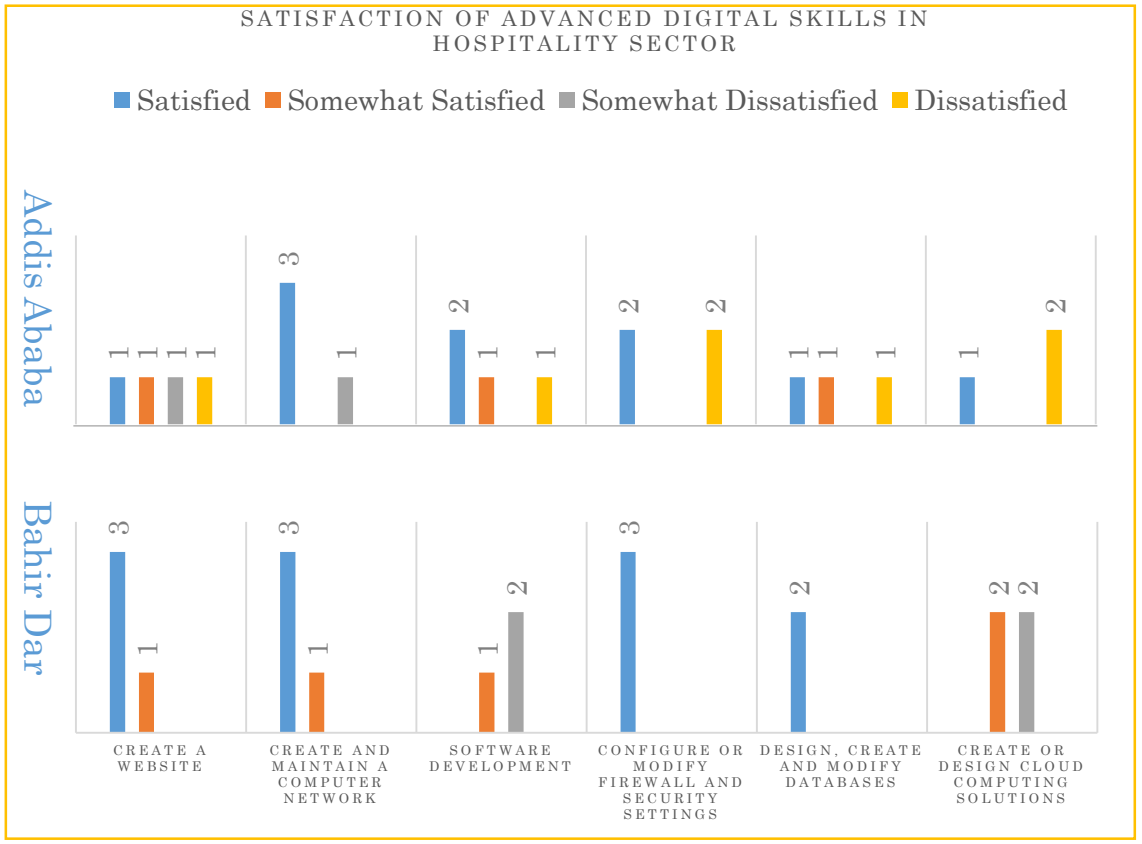
All basic digital skills are found to be either important or critical in the hospitality sector in Addis Ababa. There is a visible dissatisfaction in the hotels regarding the availability of basic digital skills in their human resources. Participating hotels in Bahir Dar find basic digital skills critical for most of their jobs. Hotels in Bahir Dar are mostly satisfied with the provision of basic digital skills although there is visible dissatisfaction with the skill to search for, collect, store and process information.





All workplace digital skills are found to be critical and important in the hospitality sector in Addis Ababa. Compared to basic digital skills, the satisfaction of employers in hotels in Addis Ababa goes down modestly. Among other workplace digital skills, there is a significant dissatisfaction in the skill to use business intelligence software. Moreover, using project management software and digital marketing platforms also exhibit certain degree of dissatisfaction.
Most of the workplace skills are said to be either critical or important in Bahir Dar. But there is some reservation with the importance of using project management software and participating in virtual meetings. The significant dissatisfaction with workplace digital skills is the usage of project management software. There is also an obvious dissatisfaction with the skill to use business intelligence software.





Respondents in Addis Ababa consider almost all advanced digital skills to be either critical or important. Most of the hotels are satisfied particularly with the availability of the skill to create and maintain computer network and undertake programming for software and application development. Even so, the data shows a visible dissatisfaction in the skills to use firewall and security settings and create or design cloud computing solutions.
In the same manner, in Bahir Dar, ,most of the advanced digital skills are said to be either critical or important. But there is some reservation with the importance of software development skills and cloud computing skills in the hospitality sector. The participants have responded they are dissatisfied with software development skill and cloud computing skills as well.

The commonly identified digital skills importance, gaps, and satisfaction levels based on hotel managers' perceptions both in Addis Ababa & Bahir Dar are:

Perceived Digital Skills Importance

- Digital skills are becoming critical among branded & star hotels. It determines the hotels competitvness, profitablity & level of customer stasfaction
- One branded hotel in Addis Ababa said 30% of its room occupancy comes from online booking
- According to interviewees, on average 65% of hotels revenue is generated from major actvities performed at front office that requires use of digtal skills
- Online communications using emails for in & out services is growing
- According to general managers, 50 to 75% of profesional postions are demanding the use of digital skills
- The use of full package IDS and OPERA software is becoming manadatory among branded hotels
- Effective use of paid digital marketing platforms can determine the profitablity of the hotel

Perceived Digital Skills Gaps

- Managers identify digital skills gaps among existing employees, graduates from University & TVET applicants .

The commonly identified gaps are:

- Limitation in professionally handling & quickly responding to emails.
- Limitations in use of spreadsheet & other MS offices effectively
- Inability to fix simple system errors and computer failures using troubleshooting options
- Both TVET and University graduates lack ability to use IDS and/ or OPERA software
- Branded hotels are currently hiring foreign experts from Kenya and elsewhere to use OPERA system
- There are wider gaps in digital marketing skills

Perceived Levels of Satsfcation

The major insight based on overall managers responses are:

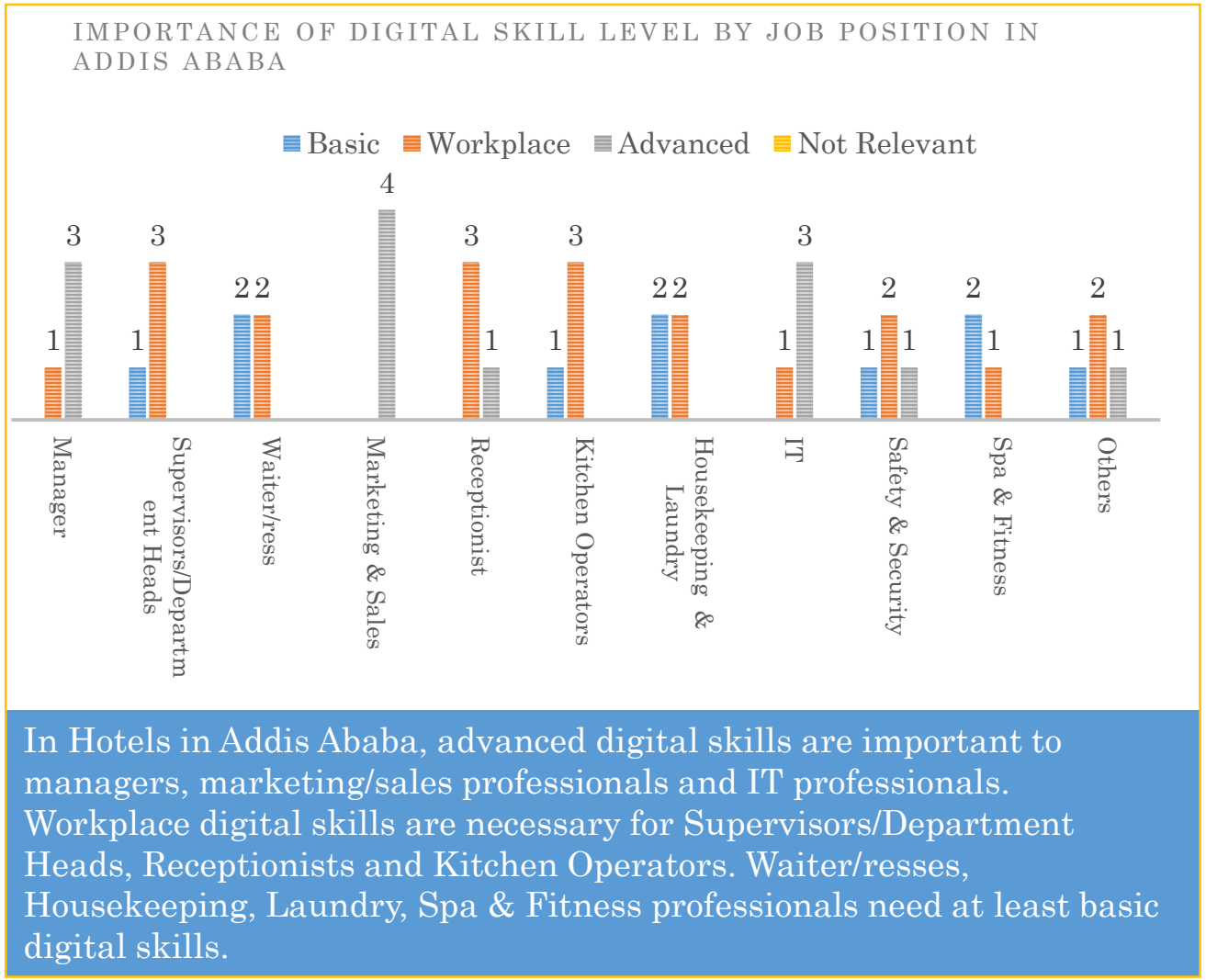
- Most CEOs/ Managers are not satisfied with digital skills levels of most employees
- There is shortage of digitally skilled profesionals in areas of ditial marketing,
- Branded hotels are dependent on expatriate professionals for the use of OPERA & IDS fullpackages
- Due to shortage of expeienced staff and limitation of skills of fresh graduates, hotels are hunting for experienced staff who are working at other hotels.

Digital Skills Importance, Gaps, and Satisfaction (Addis Ababa Vs. Bahir Dar)

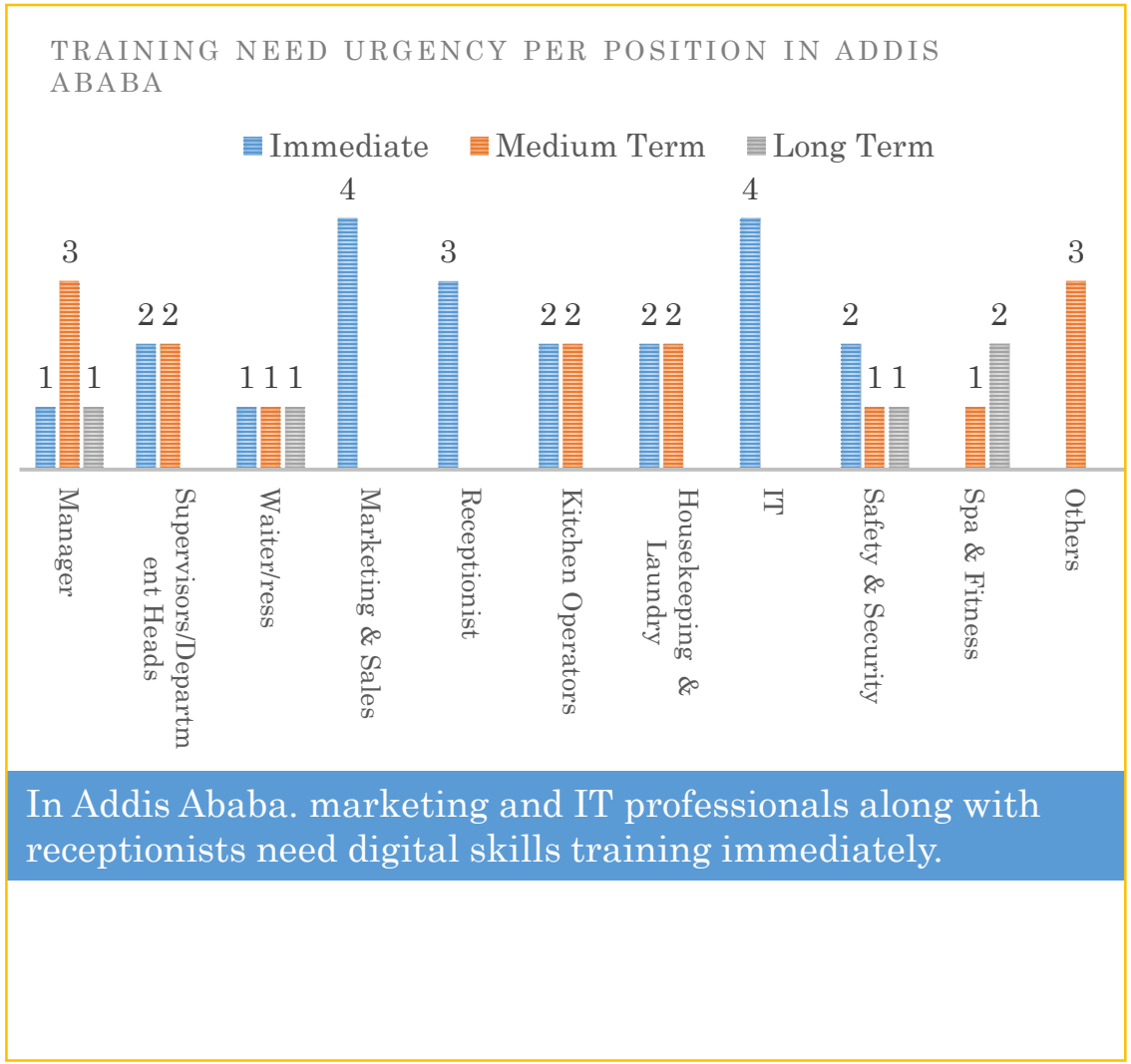
The comparison is based on in-depth interview made with four hotels at Bahir Dar and four hotels in Addis Ababa. All commonly and repeatedly identified views presented below.

Parameters	Digital skills importance and use	Digital skills Gaps	Satisfaction level on digital skills
Hotels in Addis Ababa	• There is a growing need for all digital skills use. • Digital skills are used in most of job positions • The use of OPERA and/ or IDS is becoming critical among branded and star hotels • There is a growing need for digital marketing platforms use • Intend to use Mobile- checking in the near future	• There are varied degree of digital skills gaps among existing employees and graduates joining the sector. • Workplace digital skill gap is common to all positions • Brand hotels are hiring expatriate to operate OPERA software and handle the management • Graduates were not trained on OPERA /IDS • There are shortage of staffs on digital marketing skills	• Most managers are not staffed with the digital skills levels of their employees. • They are hiring foreign experts at higher salary to remain competitive • They are using unstructured on-the- job training / coaching to bridge the digital skills gaps
Hotels in Bahirdar	• Relatively the digital skills are mainly used at front office and finance operations • CNET is the most commonly used software • There is growing use of social media platforms for promotion • Relatively there is limited investment on digital technologies • There is strong interest to use OPERA/ IDS and even paid digital marketing platforms. But most hotels consider the software expensive	• Workplace digital skills gaps is common to all positions. • Limitations related to composing formal and professional emails , responding timely, and fixing simple errors using troubleshooting are common • Basic and workplace digital skills gaps are wider among graduates from TVET and University.	• Managers are not adequately satisfied with digital skills levels of their employees • They are mainly using unstructured on -the- job training / coaching to bridge the digital skills gaps • One hotel uses internship as potential to identify good prospective employees
General Remark • Due to growing competition in Addis Ababa there is more investment on digital technologies as compared to hotels in Bahir Dar. • Use of OPERA / IDS and paid digital marketing platform is growing among branded hotels in Addis whereas CNET is still commonly used among Hotels in Bahirdar.			

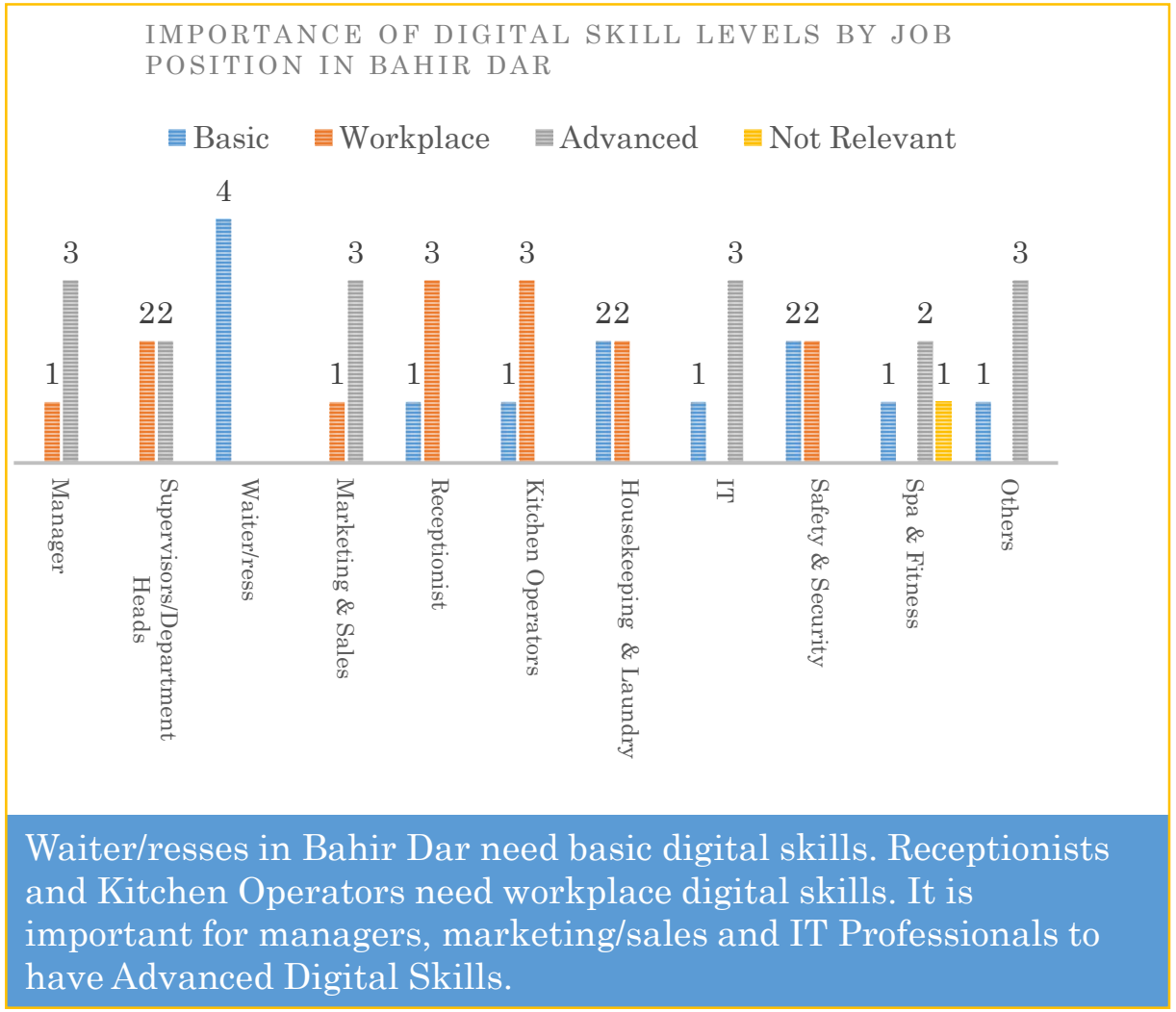
iv. Digital Skill Training Need in the Hospitality Sector



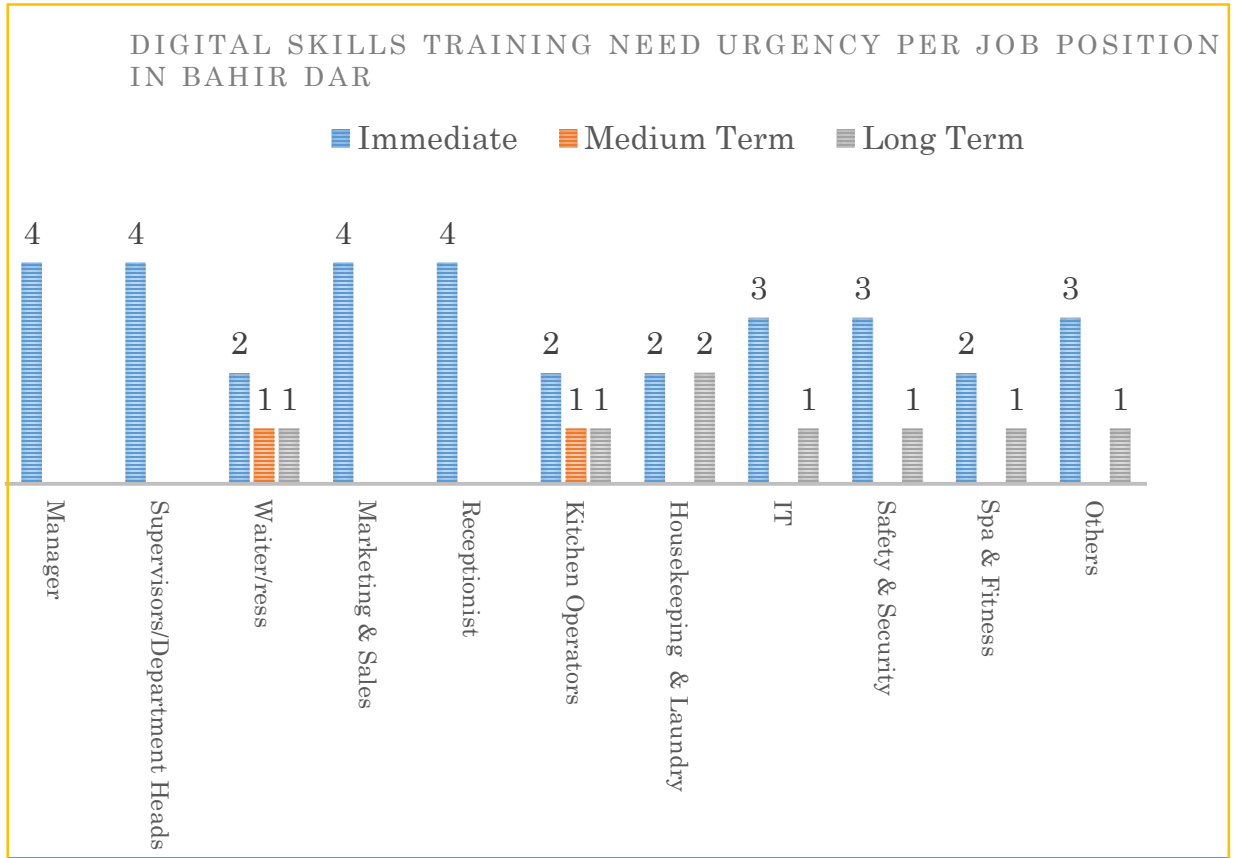
In Hotels in Addis Ababa, advanced digital skills are important to managers, marketing/sales professionals and IT professionals. Workplace digital skills are necessary for Supervisors/Department Heads, Receptionists and Kitchen Operators. Waiter/resses, Housekeeping, Laundry, Spa & Fitness professionals need at least basic digital skills.



In Addis Ababa. marketing and IT professionals along with receptionists need digital skills training immediately.

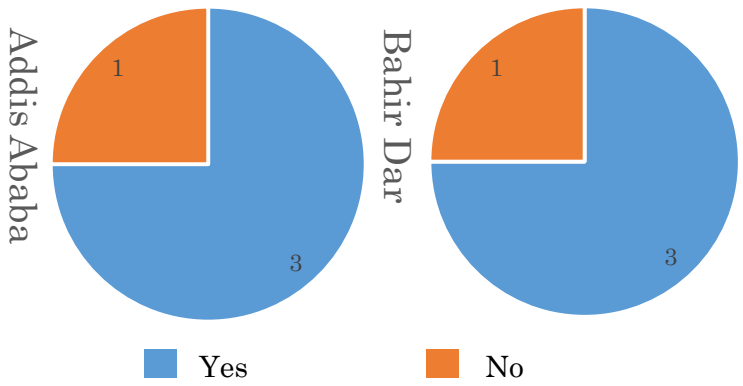


Waiter/resses in Bahir Dar need basic digital skills. Receptionists and Kitchen Operators need workplace digital skills. It is important for managers, marketing/sales and IT Professionals to have Advanced Digital Skills.



The figures show that there is overwhelmingly an urgent training need in all the job positions in the hospitality sector in Bahir Dar.

Are you planning any significant (Digital Skills) upgrading or re-skilling of your work force, or employees, in the next 12 months?



3/4th of the participant companies are planning digital skills upgrading of their workforce in the next year.

Based on managers' perceptions, diverse level of digtal skills training is required.

Currently almost all hotels are using one or more of the follwing options to bridge the digtal skills gaps identfied across various job positions :

- Conduct unstrucutred On-the-Job training (for 2-3 months)
- Supervirosy coaching
- Arrange training through use of software providers
- Hiring through internship options
- Use online digital skills training and training staffs abroad
- Outsourcing of activities
- Use of expatriate staff in managerial postions to operate OPERA & IDS and to coach others on the uses.

Digital skills gaps are commonly identifed in areas of :

- Front office operations
- Digital marketing
- Use of full package OPERA and IDS for both front and back office operations.

Digital Skills vs. Soft Skills

When the respondents were asked what they priorities between digital skills and soft skills, all most all said soft skills take the priority. This is reflected by the fact that allocation of most training budget goes to soft skill trainings such as communication skills, ethics, leadership and alike. This is the same for construction and metal sectors as well.

Insights on Future Developments in the Hospitality Sector

According to Africa Hospitality Report 2019:

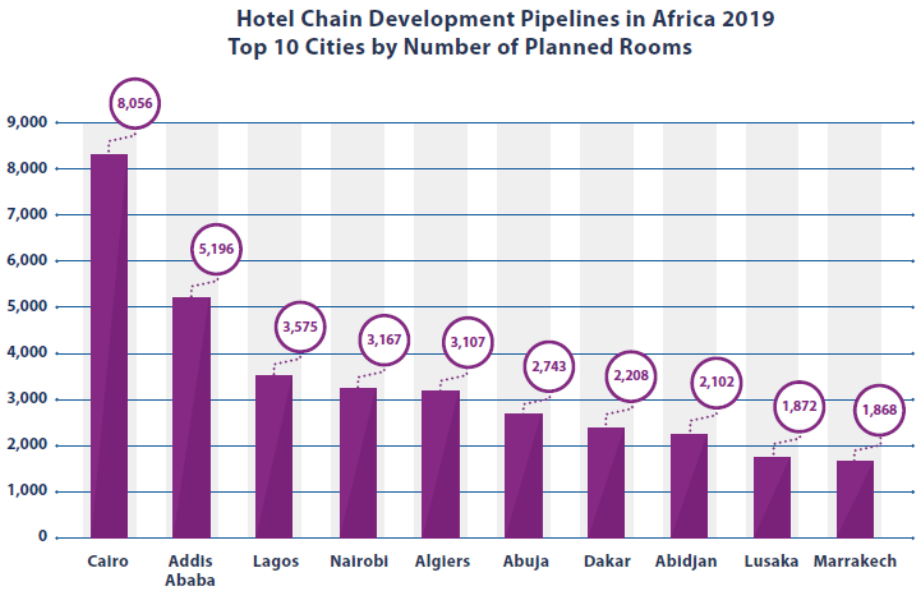
- Africa's travel and tourism contributed to 8.5% (or $194.2bn) of the GDP in 2018; from 8.1% and 7.8% in 2017 and 2016 respectively.
- Africa's share of passengers' traffic is predicted to grow by 4.9% annually over the next 20 years.
- Ethiopia's visa relaxation policies combined with improved connectivity as a regional transport hub placed the country as Africa's fastest growing travel country, growing by 48.6% in 2018 to be worth $7.4bn.
- Ethiopia, specially Addis Ababa has positive prospects for hotel industry investment for international brand hotels

According to World Hospitality Group Africa, 2019,

The top ten countries with Hotel Chain Development Pipelines in Africa are :

Country	No. of Hotels	Rooms
Egypt	51	15,158
Nigeria	49	7,840
Morocco	36	6,395
Ethiopia	34	6,184
Kenya	27	4,232
Algeria	19	4,147
Cape Verde	11	3,479
Senegal	17	2,829
Tunisia	16	2,768
South Africa	18	2,574

Similarly, the top 10 African cities by number of rooms are also presented on the following table:



Source: 2019 Hotel Chain Development Pipelines in Africa, Bench Events

Implications and recommendations

The most commonly identified learning points are :

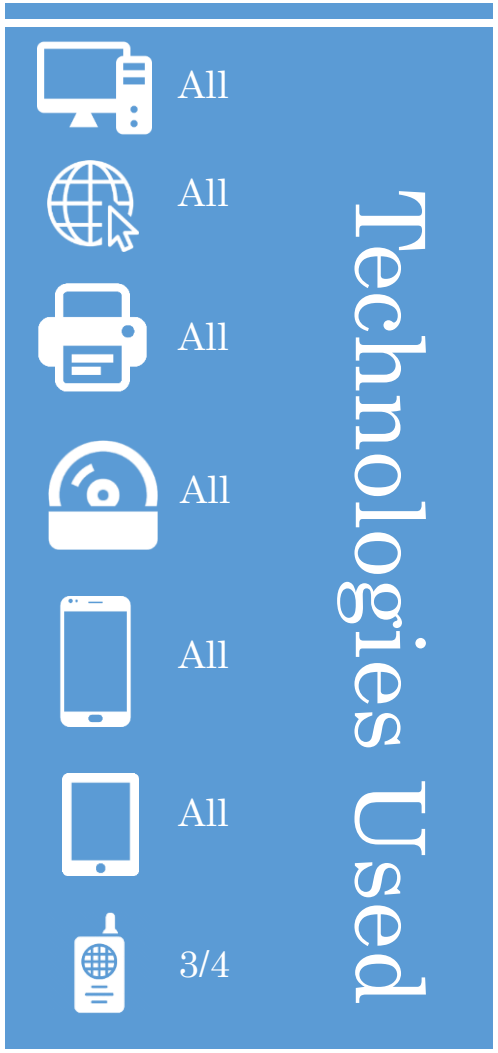
- The drive to use more workplace and advanced digital skills & technologies is higher among branded hotels in Addis Ababa.
- There is no formal supplier or trainer especially on the use of full package OPERA software. But, there are Indian agents for supporting use of IDS.
- Both TVET and University graduates are usually not trained on the use of OPERA and IDS at school.

Practical measures that should be taken:

- Mandatorily including IDS / OPERA/ ERP software training in the curricula
- Encouraging online certification (for instance, from Microsoft, Google) as mandatory requirements for employment
- Assist private training providers on various short term bridging and upgrading digital skills through co-creation model through bringing on board hotels managers, supervisors , training/ educational providers, supplier agents hotel owners' association and Ministry of Tourism & Culture
- Improving the quality of internship (dual training) through introducing both incentives and obligatory measures
- Strengthen existing unstructured on-the-job training and coaching
- Providing incentives to encourage investment on digital technologies including authorized software use.

B. CONSTRUCTION SECTOR

i. Technologies Used and Perceived Impact



Technologies used

Summary of construction managers' interview responses indicate:

- Despite the perceived importance of digital technologies and skills, it's practical use is largely limited among contractors.
- Most of the time, digital tools and technologies are largely used to support back office operation, occasionally on design & project management activities .

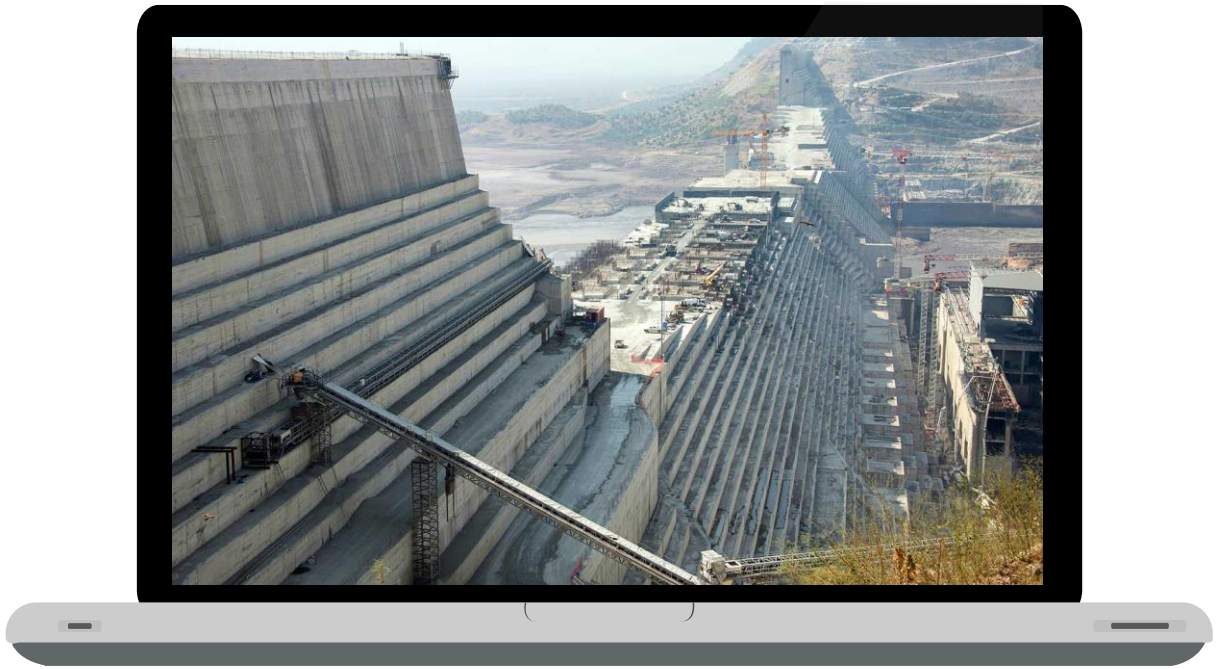
Currently, the most commonly used digital technologies are:

- Computers, internet, MS office packages
- In-house developed ERP software
- AutoCAD (software)
- MS Project (software)
- ArchiCAD
- Revit
- Video Surveillance
- Devices for Video Conference

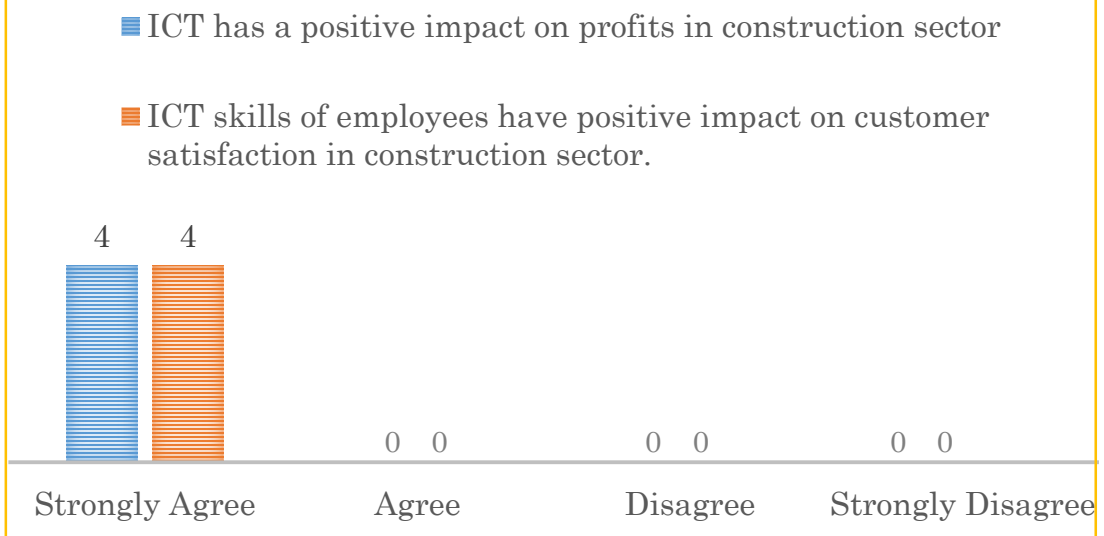
The digital technologies intended to be used by Ethiopian Construction Works Corporation are:

- Full package authorized ERP system
- Planned huge data center & Networking in collaboration with Federal Government support
- Digitally operating devices that allows the use of remote sensing, billing mechanism and functioning sensors

In general, there is limited use of advanced digital machines and technologies in the construction sector. There is limited incentive or pressure to make investment in digital technologies and skills .

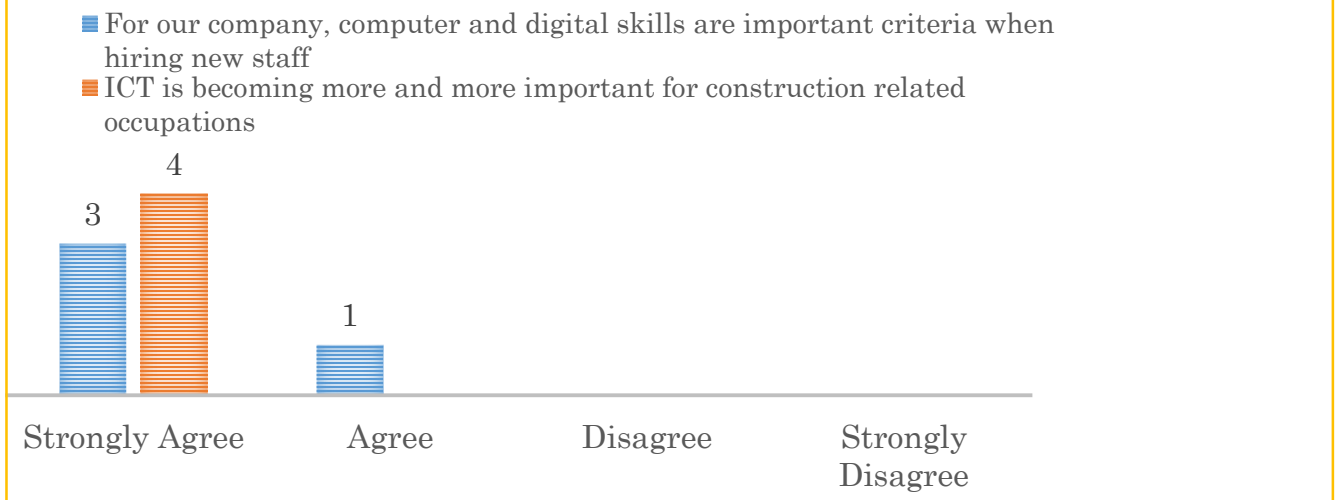


PERCEIVED IMPACT OF ICT ON PROFIT & CUSTOMER SATISFACTION



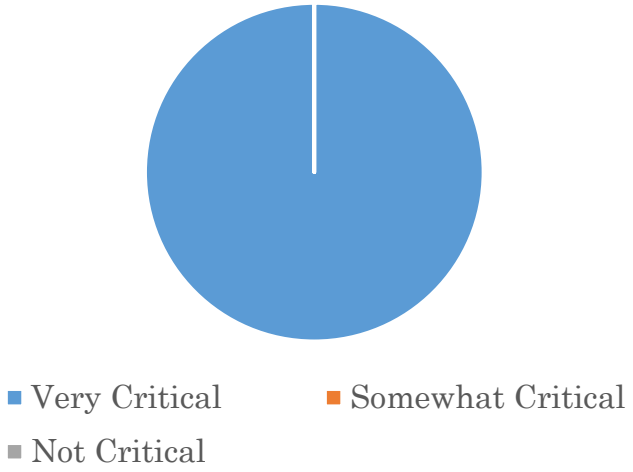
All participants in the construction companies have universally agreed ICT has a positive effect on profits and customer satisfaction in the sector.

ii. Digital Skills and Construction Jobs (Occupations)

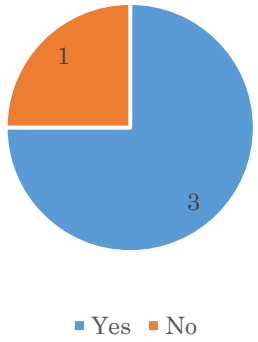


All respondents approve the importance of ICT in the sector and accept that it is a vital criteria when hiring new staff.

How critical is it for your organization to have employees with digital/ICT skills?



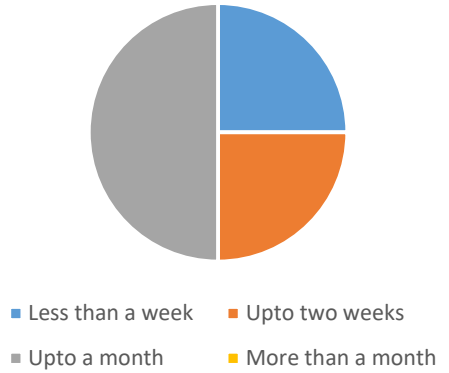
Do you find it challenging to hire employees with excellent ICT skills?



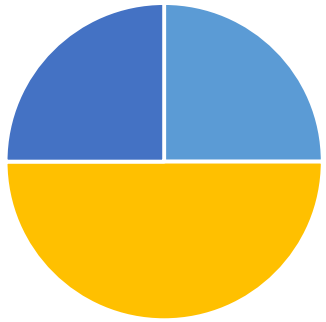
3/4th of respondents said they find it challenging to recruit ICT skilled employees. The main reason mentioned for this is, the dynamism of technology makes it hard for construction companies to keep up and graduates do not have the latest knowledge and skills.

All construction companies that participated take less than a month when hiring new employees

On average, how much time do you take to hire new employees with digital/ICT skills?



How many vacancies with requirements for digital and computer skills did you advertise in the past 6 months?



Only One Two Three More than Four None

Half of our respondents have advertised vacancies in the past 6 months more than four times. Moreover, there are companies that do not post vacancies because there approach to recruitment involves referrals and head-hunts.

FROM WHICH EDUCATION/TRAINING PROVIDERS DO YOU USUALLY HIRE GRADUATES WITH BETTER DIGITAL/ICT SKILLS?

Government universities are the best places for excellent ICT skilled graduates for the construction sector.

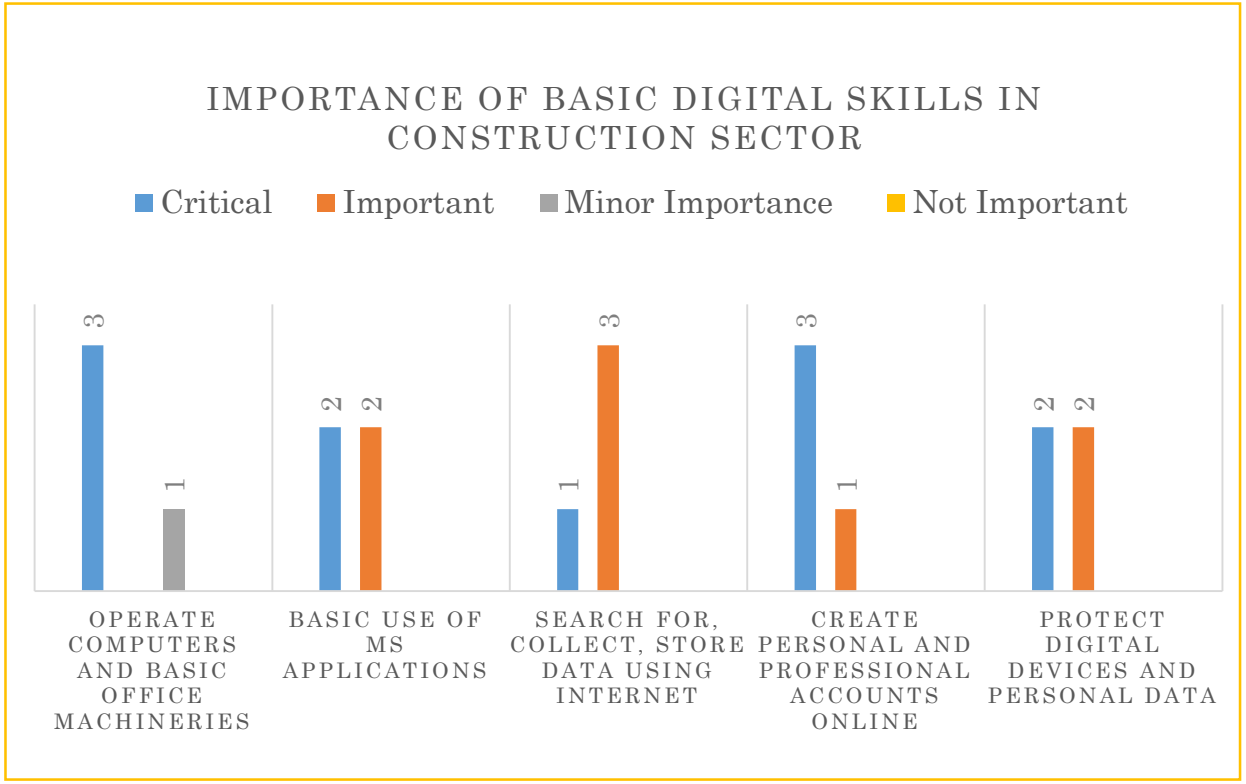
Practically the digital technologies and skills use in the construction sector seems limited. Yet practically, digital skills are occasionally used among the following job positions :

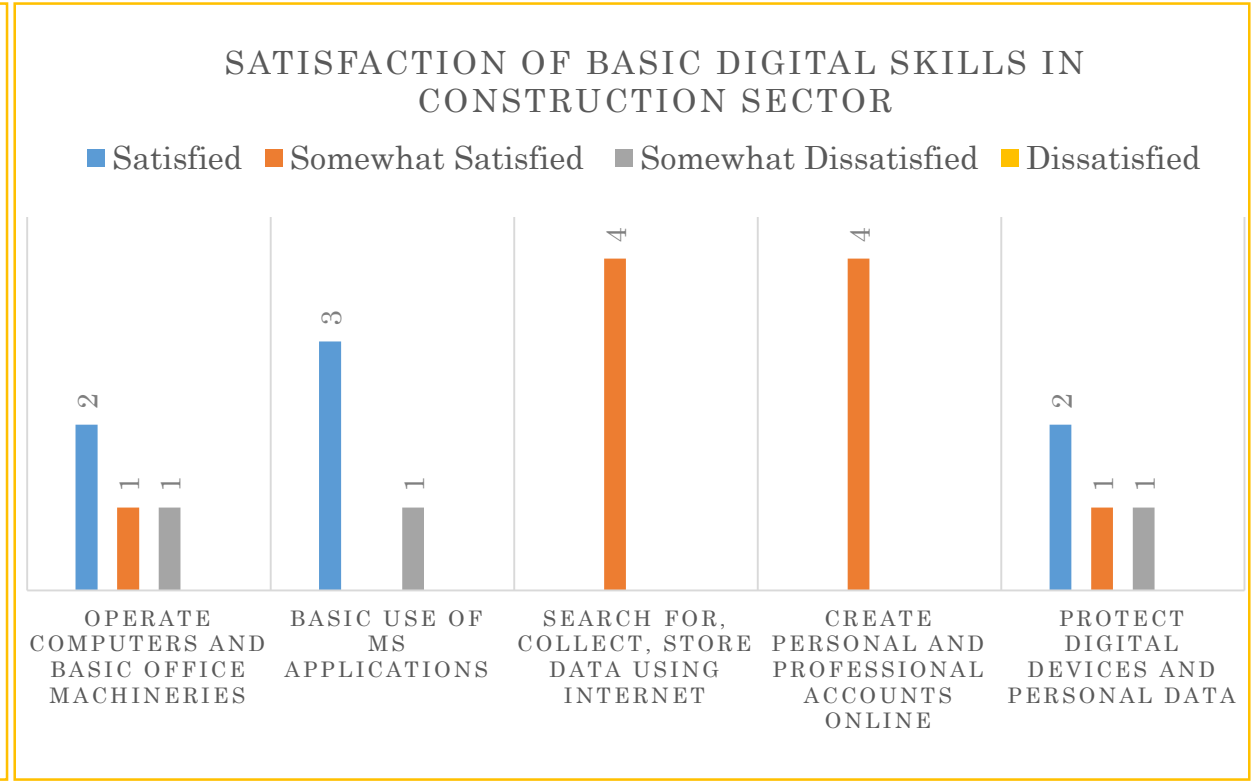
- Designing and surveying
- Project management
- Supervision by engineers
- Partly in contract administration
- Partly in finance, inventory management, and HR system

Whereas, relatively more frequent use of digital skills are identified in areas of :

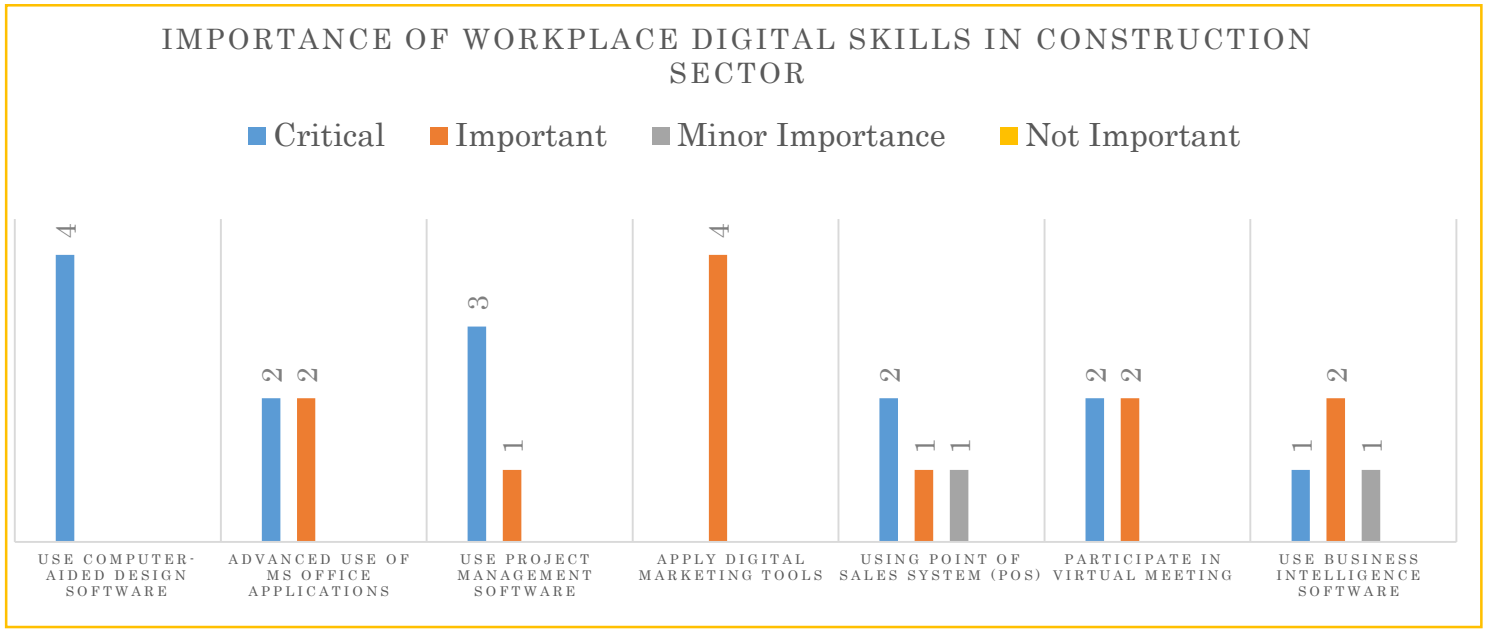
- Back office for handling routine tasks;
- Office engineering/for planning and designing and partly execution.

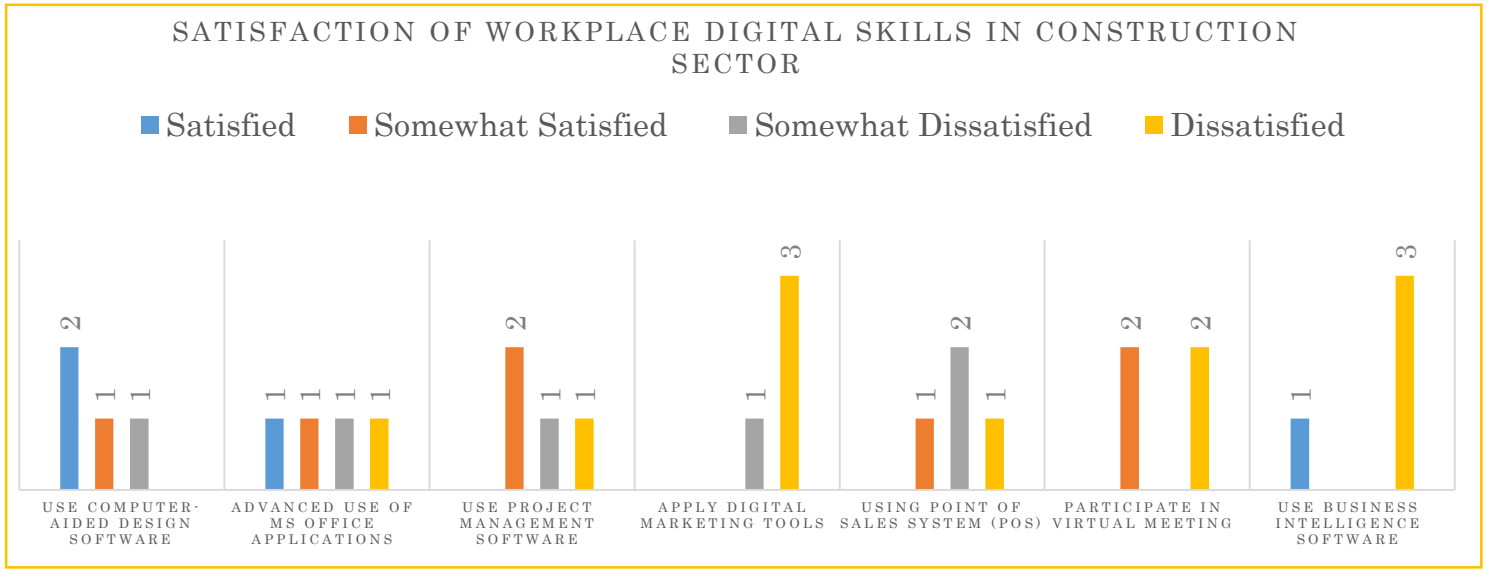
iii. Digital Skill Levels Importance & Satisfaction in the Construction Sector





All basic digital skills are stated as critical or important by most respondents. There is a reasonable satisfaction with basic digital skills among construction companies.

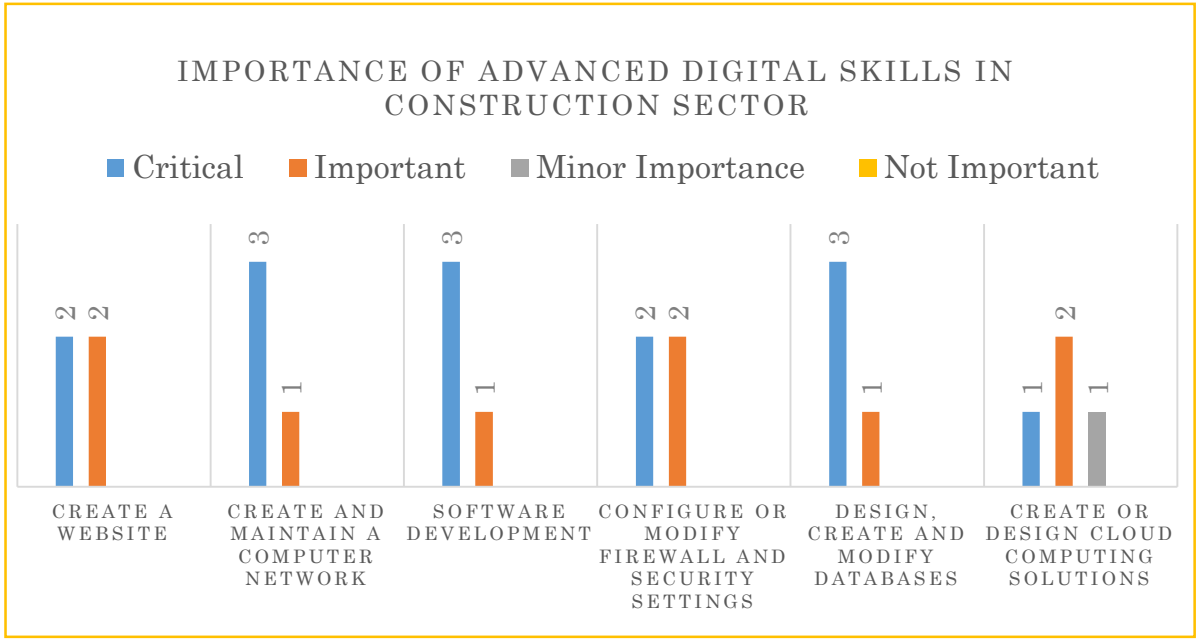


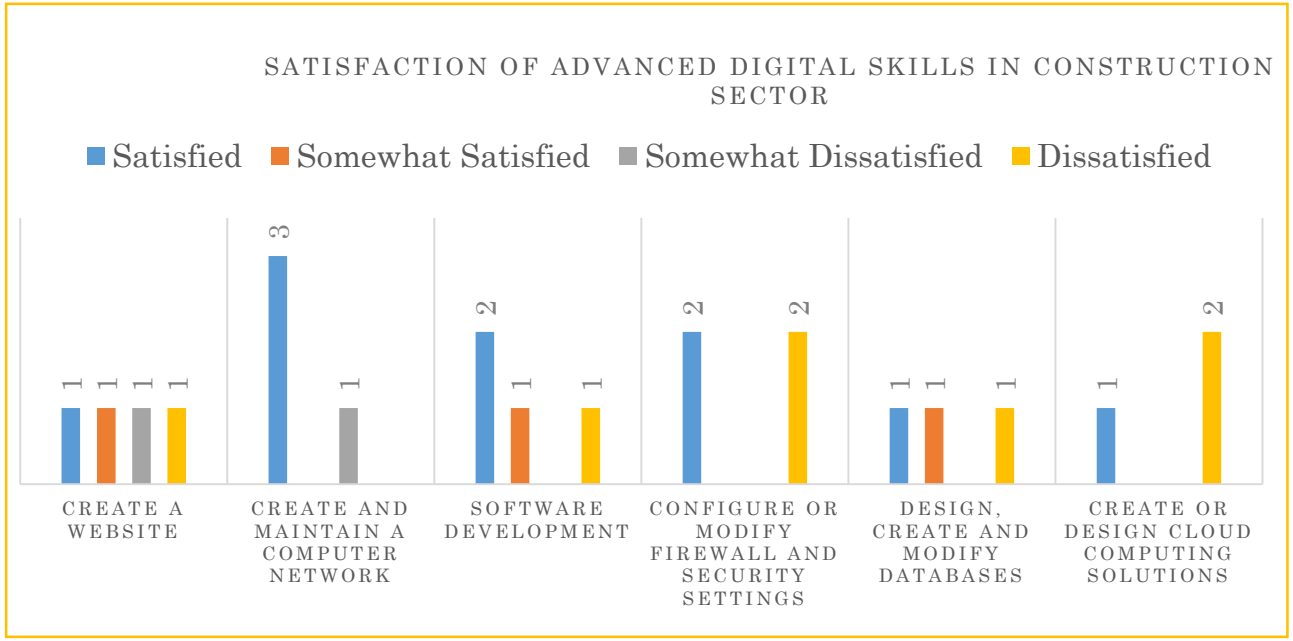


Respondents identify all workplace digital skills as either important or critical to their jobs. Nevertheless, according to their replies, there is a significant dissatisfaction with the availability of workplace digital skills in the workforce.

For example, even though all unanimously agree Digital Marketing Skills are important to their jobs, all have stated they are dissatisfied with their efforts in promoting their companies online.

Even though, they are satisfied with using construction software such as AutoCad, there is visible dissatisfaction with using project management software, using POS, participating in virtual meeting and using business intelligence software.





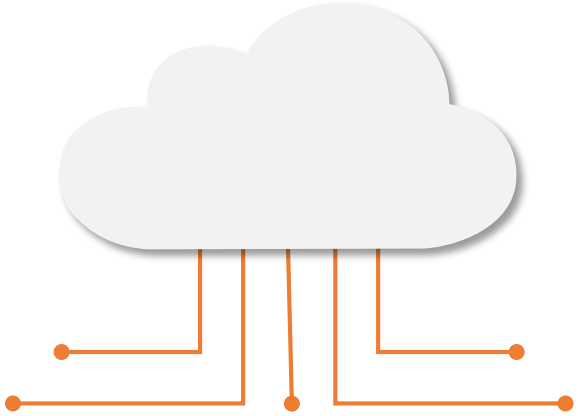
All advanced digital skills are either critical or important to our respondents. Respondent companies are somewhat satisfied with creating website and creating and maintaining computer network skills. But there is an evident dissatisfaction with the rest of workplace digital skills.

Percived Digtal Skills Importance

- There is limited digital skills use in the construction sector
- Some managers suggest 60% of the profesional staff require some levels of digital skills
- Digital technology and skills use are perceived very important to:
    i. Reduce paper work
    ii. Reduce project time and cost
    iii. Increase profitability though work flow efficiency

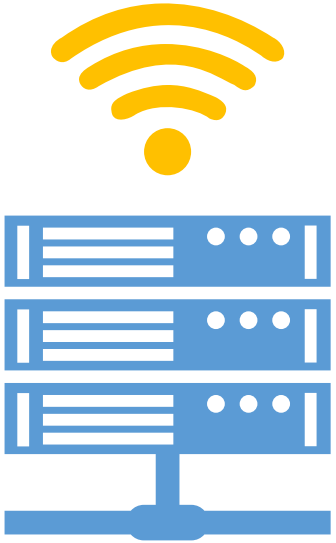
Perceived Digital Skills Gaps

- Since there is limited use of digital skills and technologies among most industries, it is difficult to generalize on digital skills gaps of employees
- Most graduates from TVET and University have digital skill gaps in areas where they are assigned

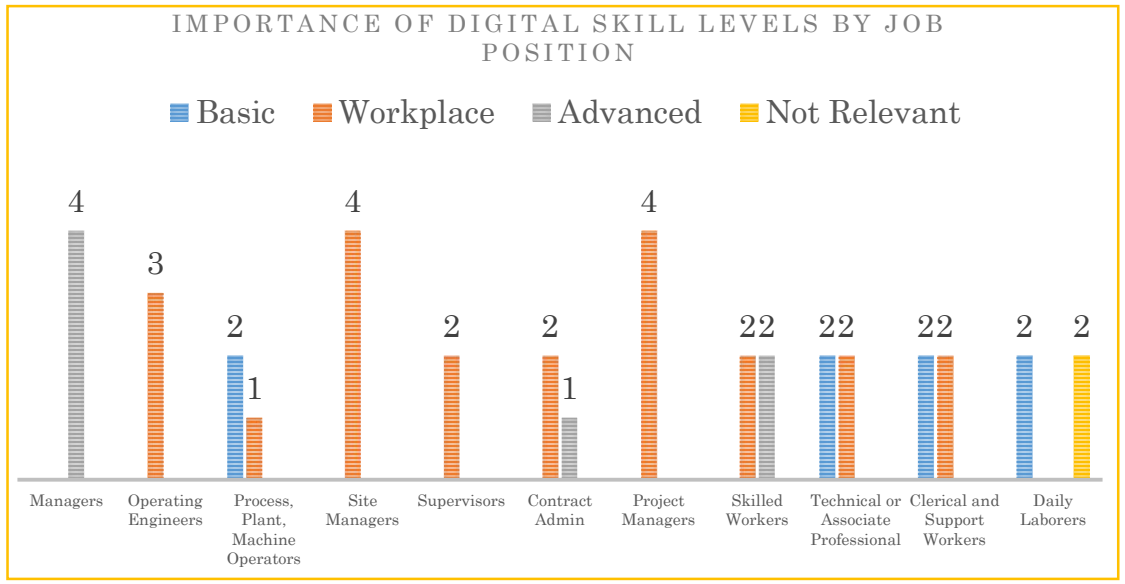


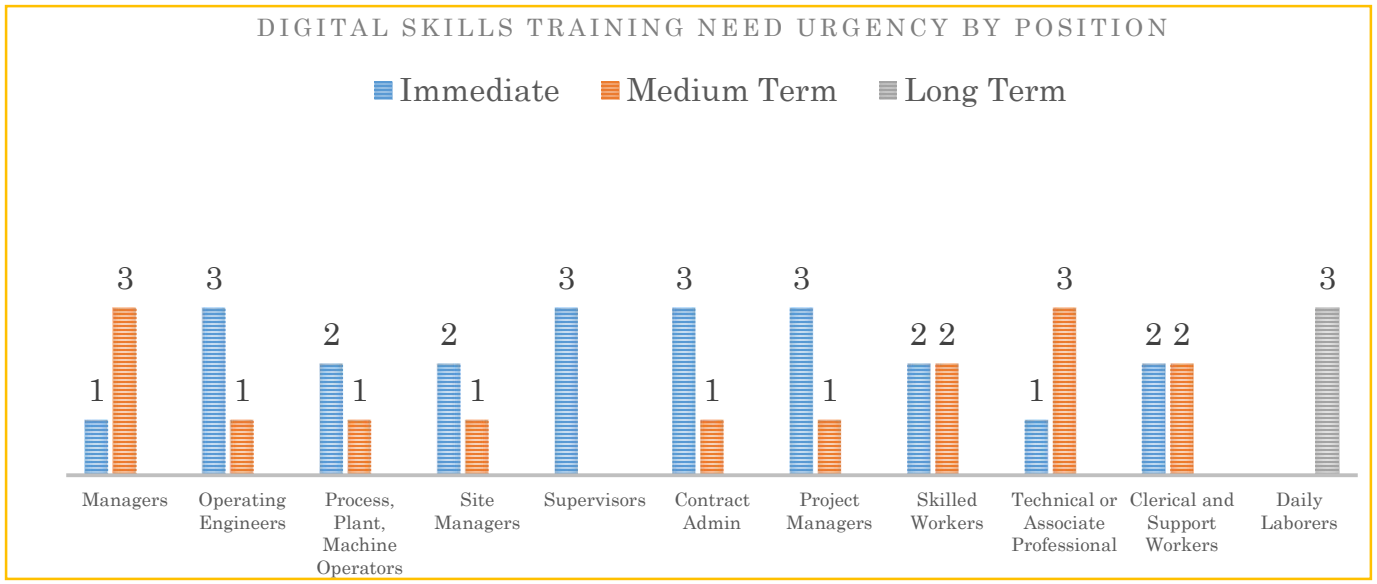
Perceived Levels of Digital Skills Satsfcation

- Despite limited use of digital technologies, the mangers are not satisfied with the current digital skills levels of their employees
- Even at international standard, the construction industy still has generally low level of automation



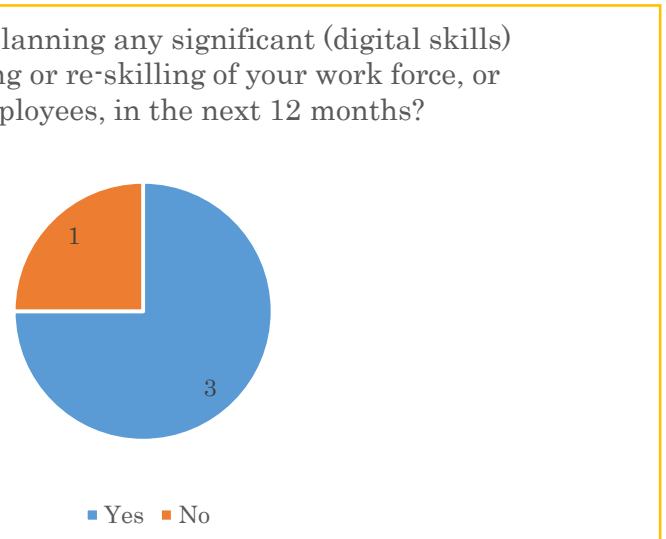
iv. Digital Skill Training Need in the Construction Sector





According to our respondents, advanced digital skills are important mainly to managers.
Workplace digital skills are important to operating engineers, site managers, supervisors and project managers.
Basic Digital skills are somewhat important to machine operators, technical associate professionals and clerical and support workers.

There is an immediate training need for operating engineers, supervisors, contract administrators and project managers. Those who need digital skills training in the medium term are managers, and technical associate professionals. Daily laborers need for digital skills is not urgent at all.



3/4th of the participant companies are planning digital skills upgrading of their workforce in the next year.

Digital Skills Training Needed

- Digital skills gaps are mostly identified in: design, project planning, and execution

Currently, the commonly used actions in the construction sector are:

- Conduct unstructured on–the-job training (Supervisory coaching)
- Training abroad when new technology is used

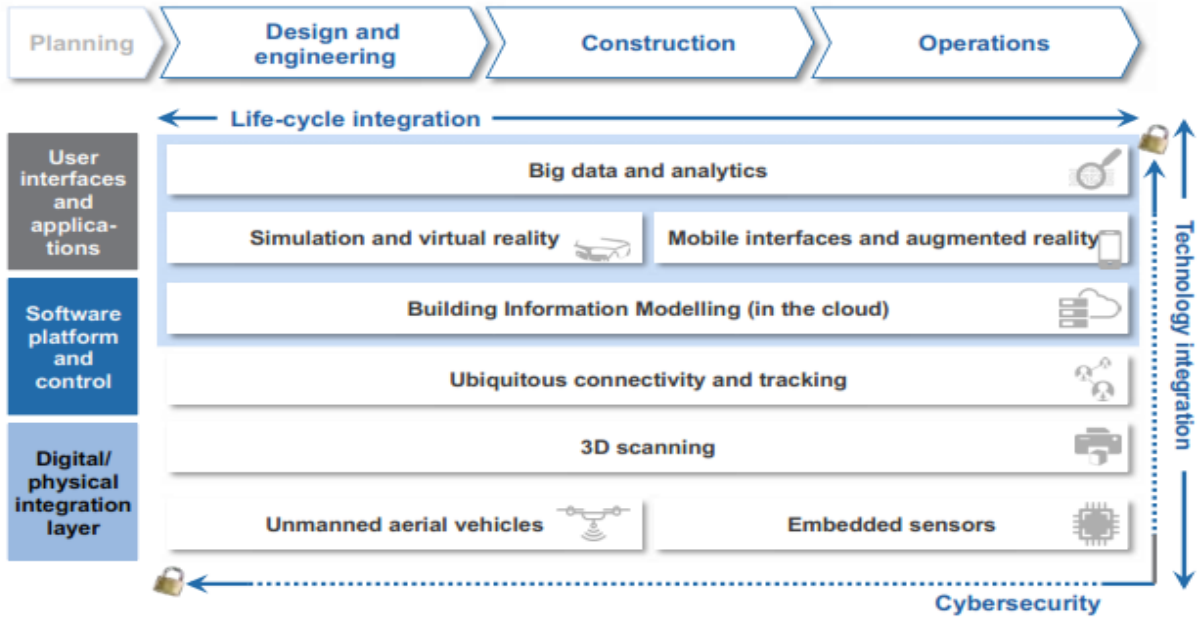
Implications & Recommendations

According to commonly shared views by all construction managers:

- The common features of construction sectors in Ethiopia are : frequent design change ; frequent request for project completion extension time , dramatic surge in project cost, and dissatisfaction of clients. Most managers strongly suggest these features of the sector could change through proper application of integrated digital technology and skills.
- It is highly imperative to work on increasing the digital awareness of contractors through introducing both incentives and mandatory compliance on the use of digital technologies . (e.g. making handling of bid documents digital, making use of integrated ERP and MS project use mandatory & giving tax incentives for investing on digital technology and digital skills.

- According to global construction sector report (WEF, 2019), digital technologies and skills applications in the construction sector is all about investment on big data analytics, networking, and investment on semi/ fully automated machines.
- It is also imperative to consider the following diagram to guide investment in digital skills and technologies across engineering and construction value chains as depicted hereafter:

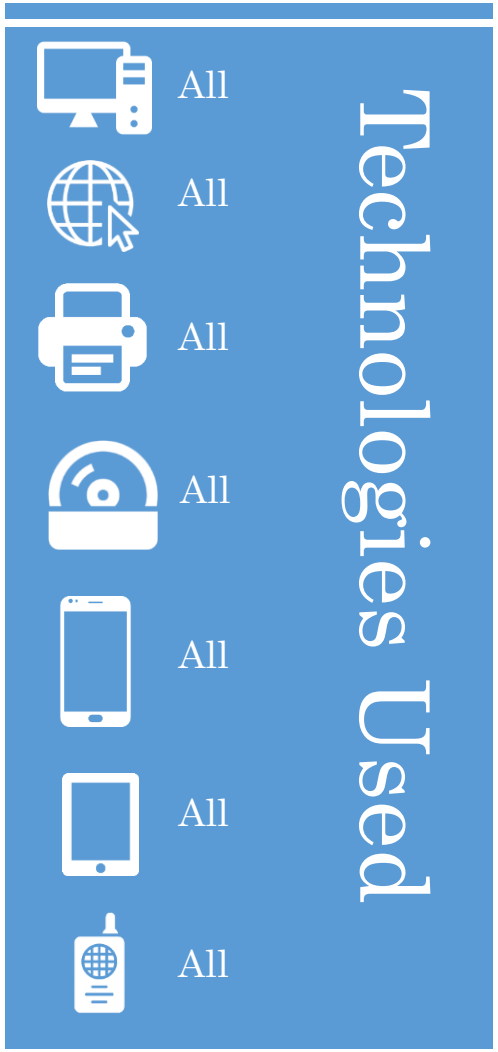
Digital Technology Applied in Construction Value Chain



Source : Global Construction Report (WEF, 2019)

C. METAL SECTOR

i. Technologies Used and Perceived Impact

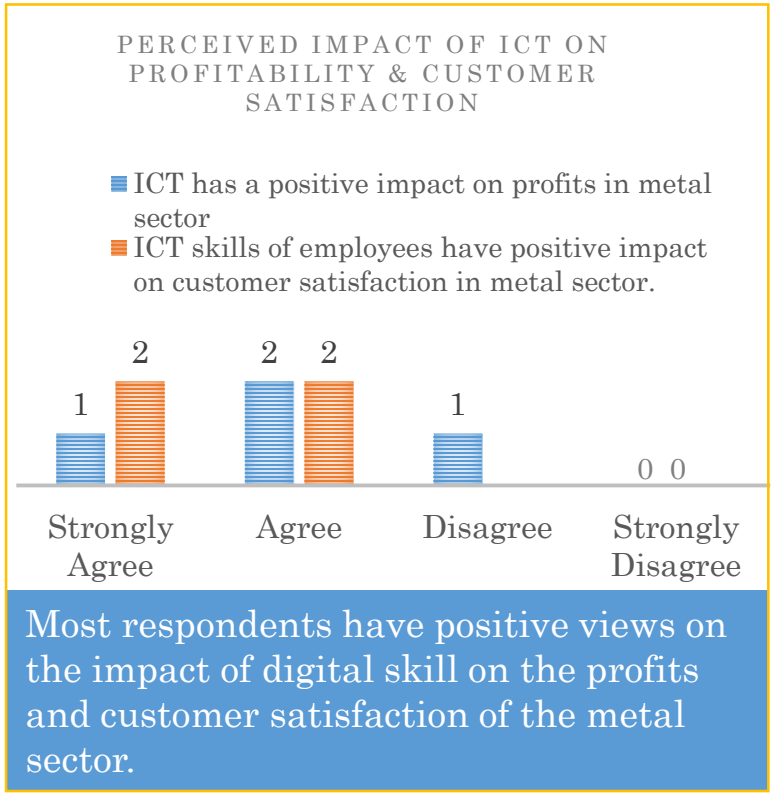


Based on the interview from managers the commonly used digital technologies in the sector are :

- Computer, MS office and Internet for mainly support functions
- AR Solution
- CNC
- Digital galvanizing and cutting machines
- AutoCAD
- ArchiCAD
- REVIT

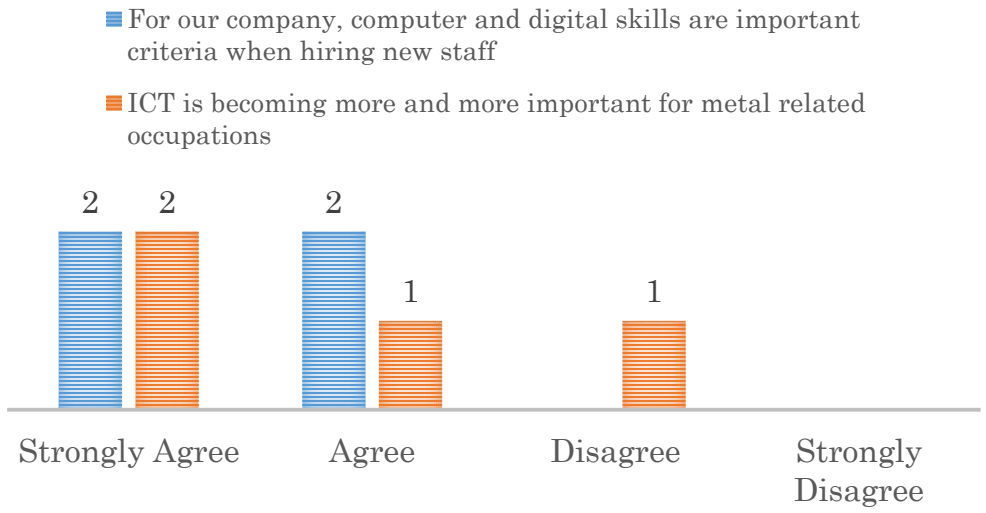
Summaries of responses from managers identified:

- Older metal industries all use manually operated machines. i.e. The majority of metal industries use more of manually operated machines
- The basic digital skills are commonly used for back office support services
- New metal industries uses semi-automated digital machines that demand advanced digital and workplace skills
- Software investment is considered expensive.



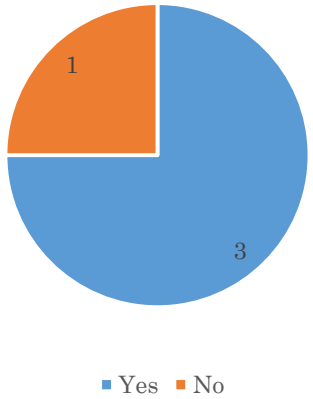
Most respondents have positive views on the impact of digital skill on the profits and customer satisfaction of the metal sector.

ii. Digital Skills and Metal Jobs (Occupations)



Most respondents correspond in the belief that computer and digital skills are important when hiring new staff and believe that ICT is important for metal related occupations

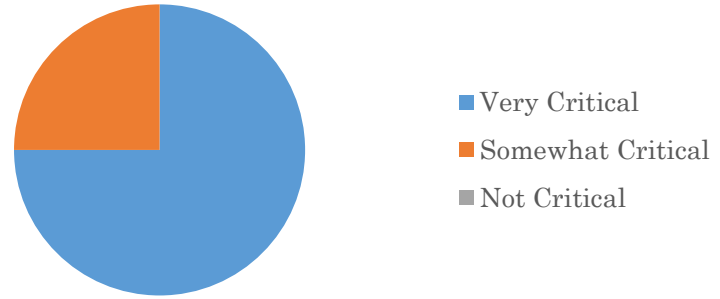
Do you find it challenging to hire employees with excellent ICT skills?



All participants bar one find it challenging to hire employees with excellent ICT skills. The difficulty is due to

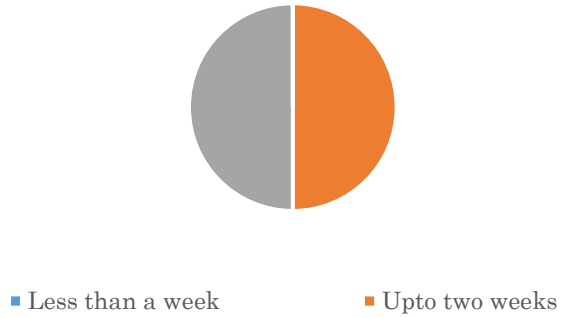
a. Newness of metal digital technology in the country
b. Lack of practical digital skills in Graduates
c. High salary demand
d. High turnover of digitally skilled employees

How critical is it for your organization to have employees with digital/ICT skills?

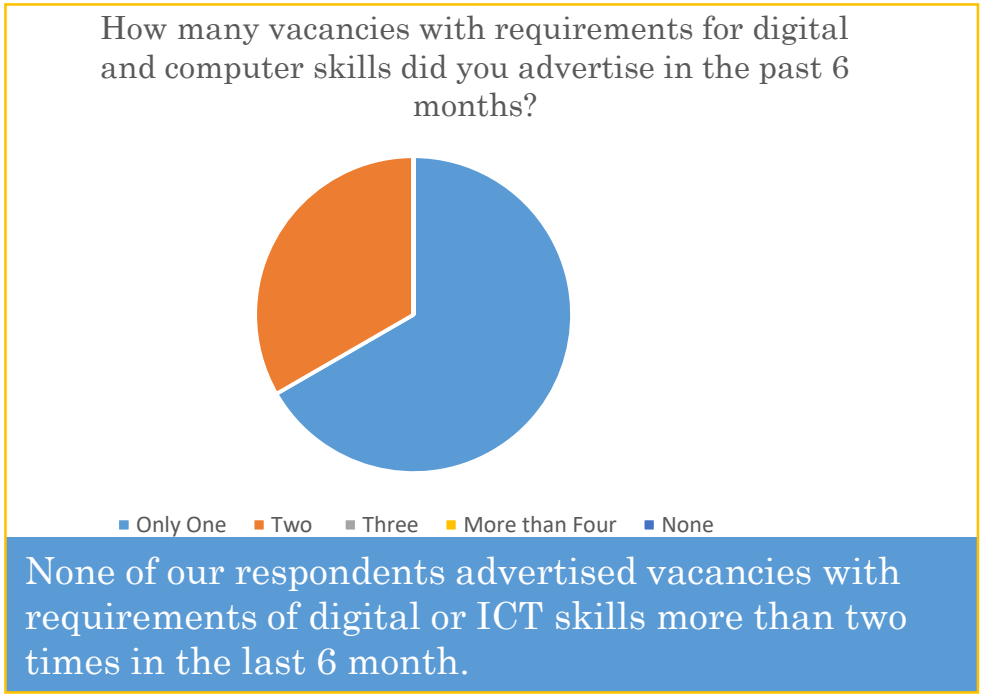


¾th of respondents say it is very critical for them to have employees with ICT skills

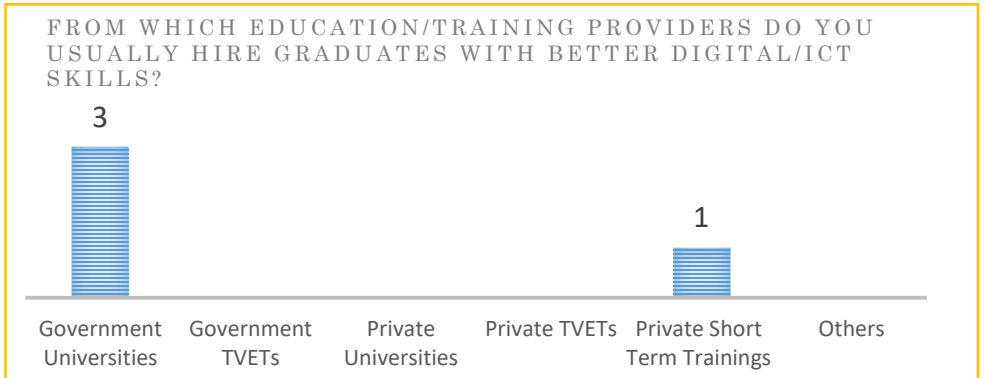
On average, how much time to you take to hire new employees with digital/ICT skills?



It takes half of the respondents up to a month to hire new employees with ICT skills.



None of our respondents advertised vacancies with requirements of digital or ICT skills more than two times in the last 6 month.

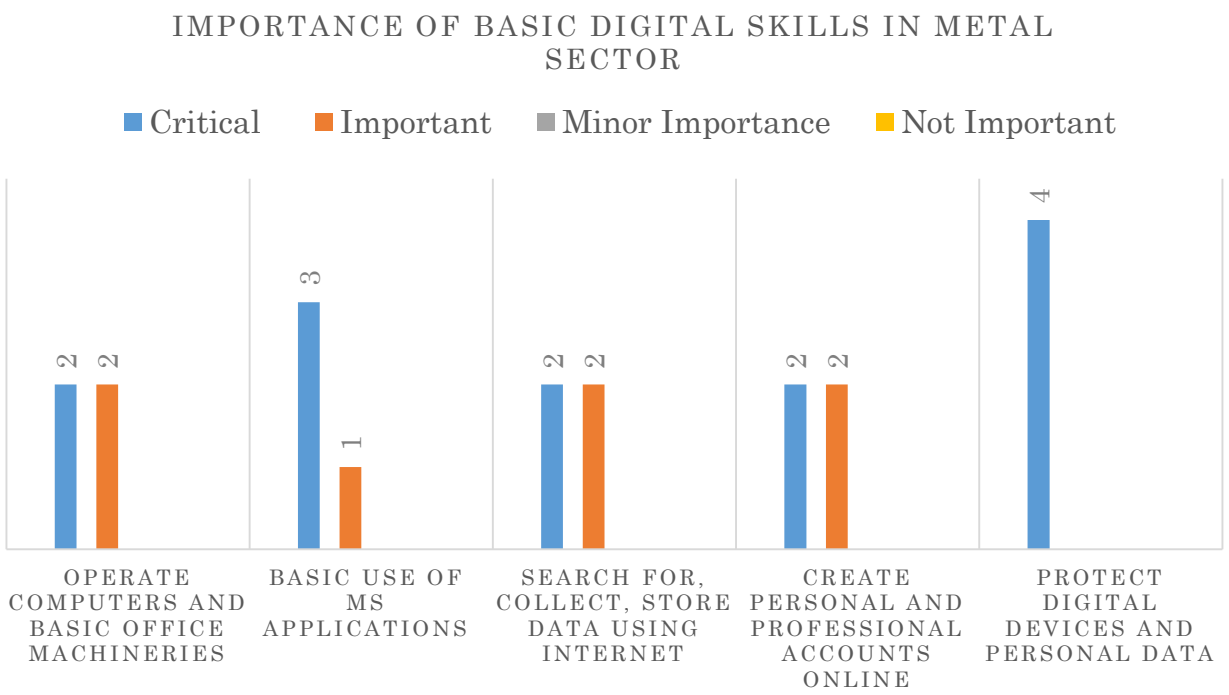


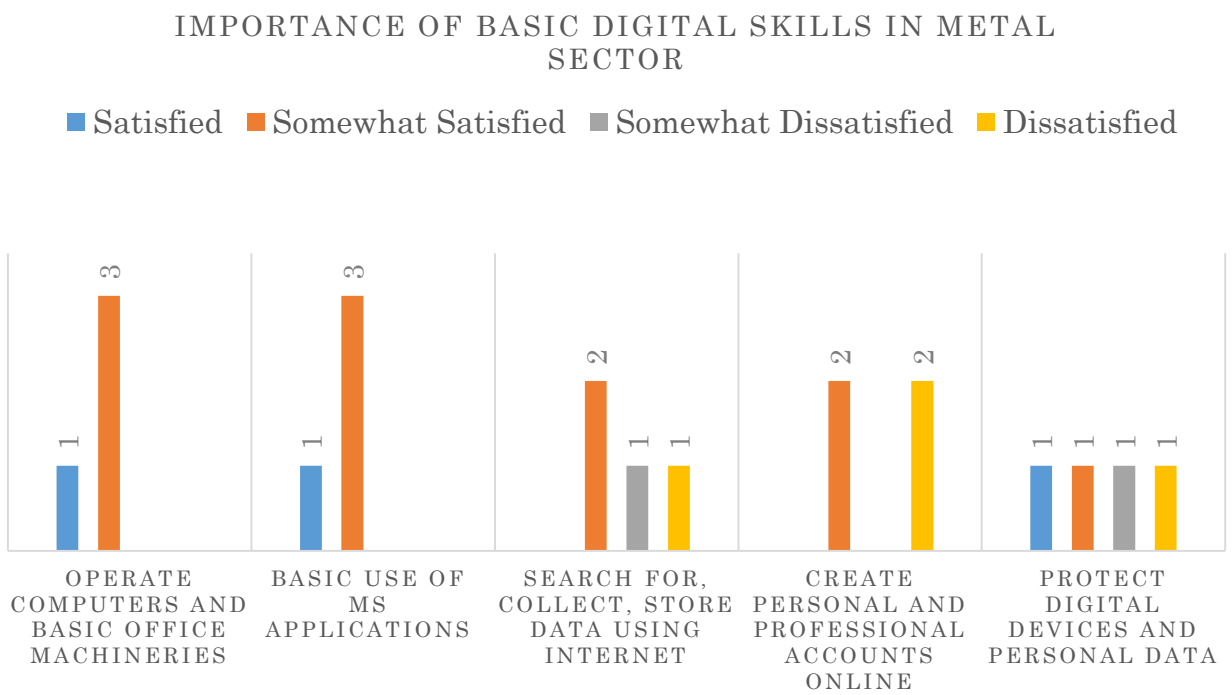
Government Universities are the favorite educational institutes for the respondents to recruit employees with excellent ICT skills.

Additional Remarks

- Most important digital skills are required in design, database operation, and programing machine operation
- Managers, engineers and supervisors need work place and advanced digital skills in newly established industries that use semi automated machines
- In older metal establishments, limited positions need workplace digital skills
- CNC machine operation is becoming an important digital skill.
- Basic and somehow workplace digital skills are frequently used in the back office professional job positions.

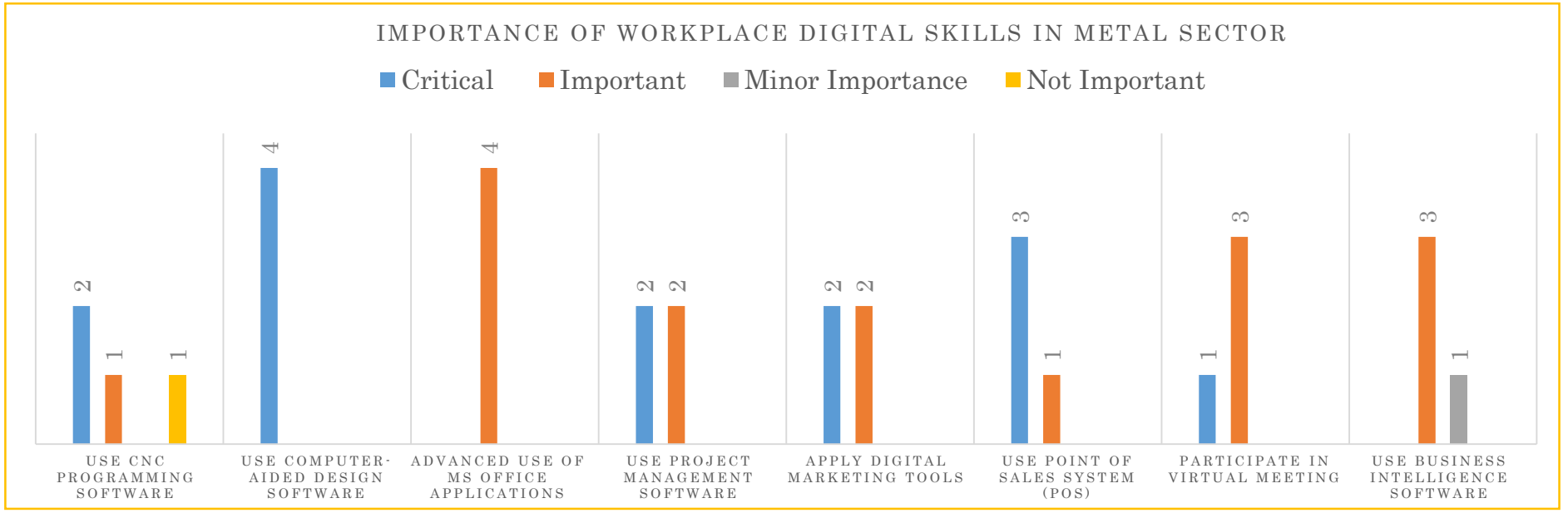
iii. Digital Skill Levels Importance & Satisfaction in the Metal Sector

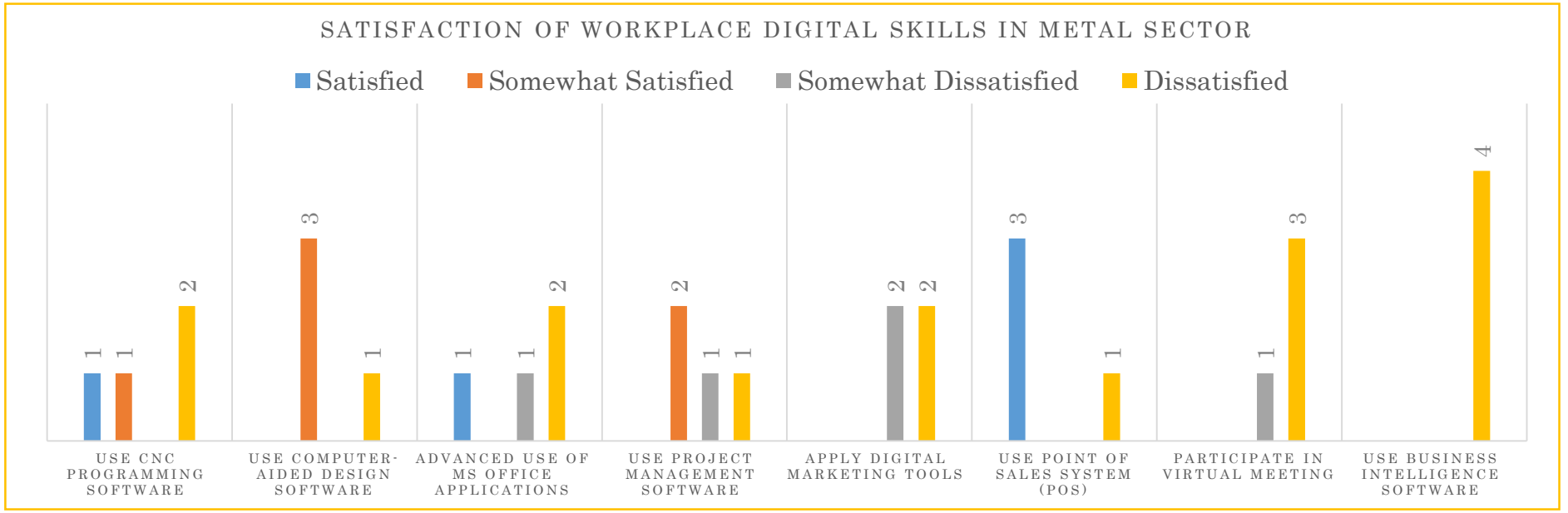




All basic digital skills are either critical or important in the metal sector according to the respondents.

The participants are satisfied with operating computers and basic office machineries like printers and using the MS Office package but are somewhat dissatisfied with using the internet, emails and protecting digital devices using passwords and anti-viruses.

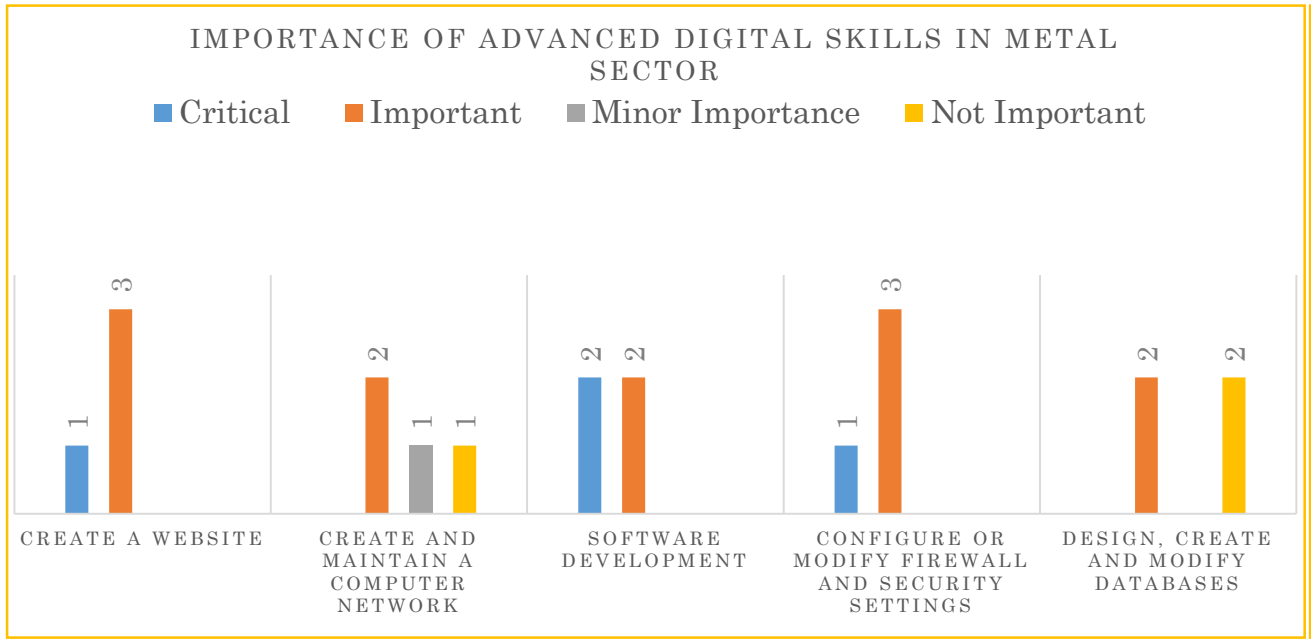


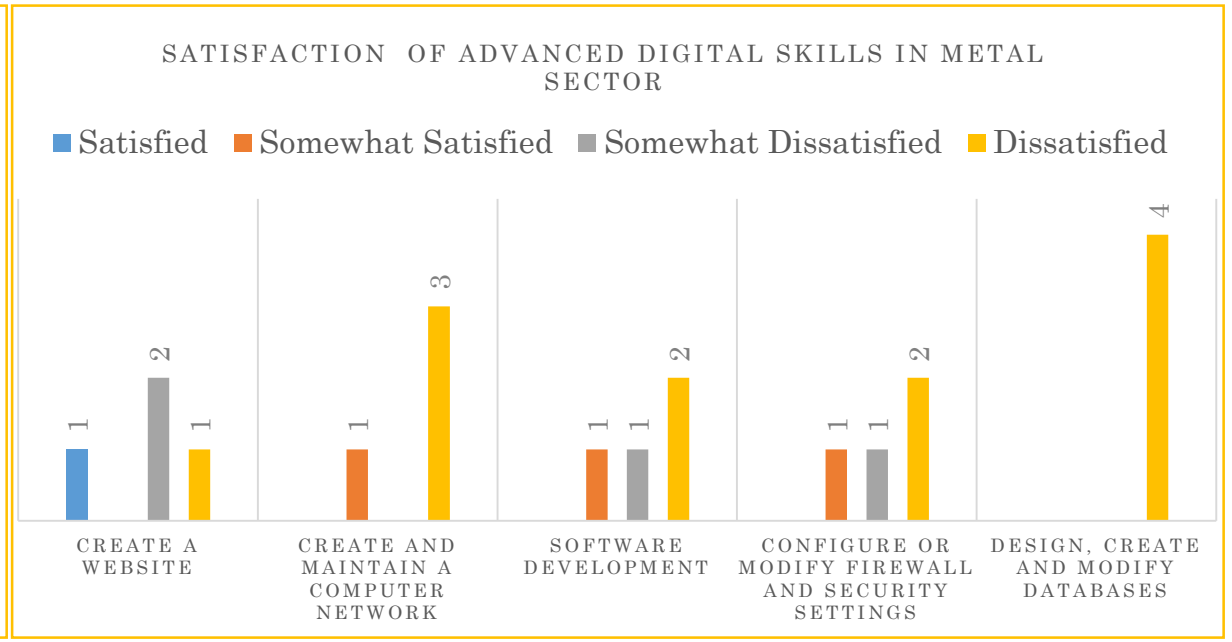


Almost all workplace digital skills are identified as important or critical by the respondents.

The workplace digital skills that our participants are mostly satisfied with are using computer aided design software such as Solid Works and CATIA and using the POS to process customer transaction.

There is an overwhelming dissatisfaction with using business intelligence software and with the skill of participating in virtual meetings.



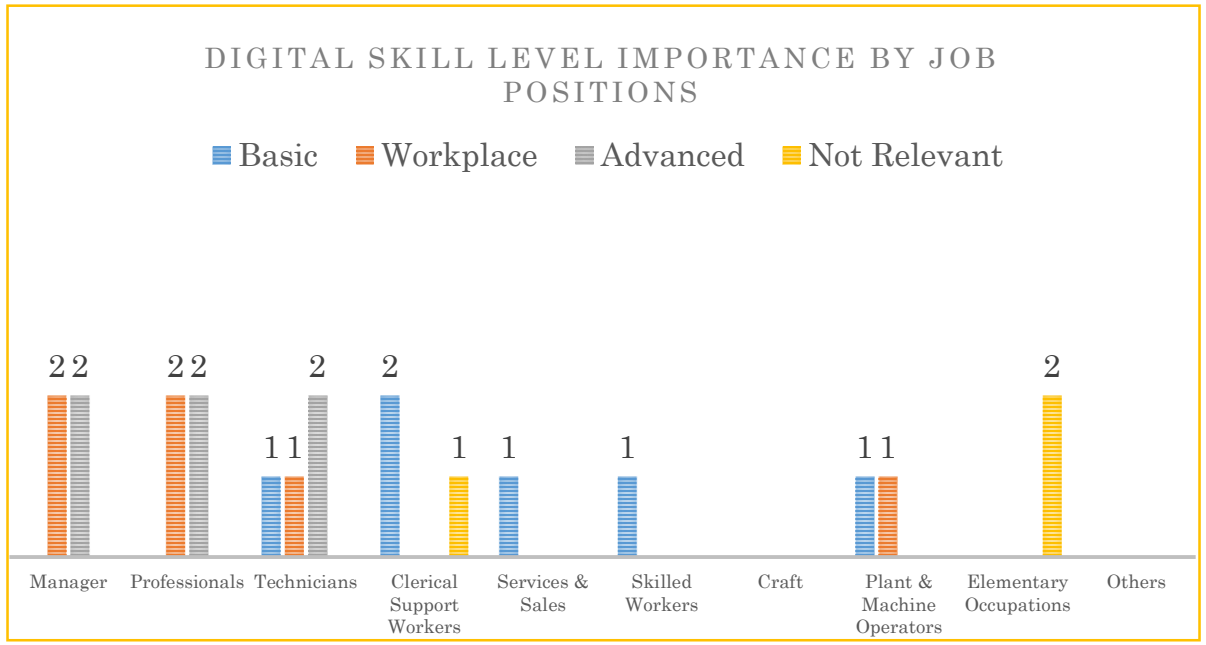


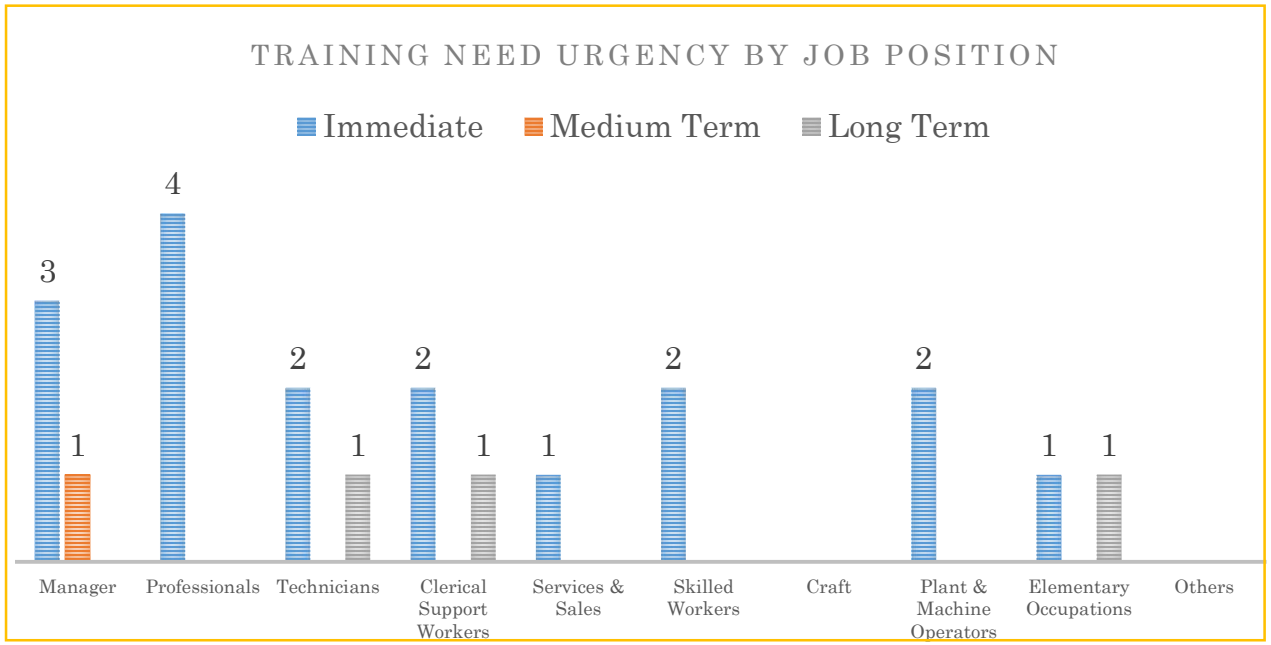
Some respondents don't believe software development and cloud computing skills are essential digital skills in the metal sector. There is an overwhelming dissatisfaction with the availability of all advanced digital skills in the metal sector according to our respondents.

Additional Remarks

- There is huge gap in operating semi-digital machine
- Due to lack of locally trained professionals to operate semi automated machines used in the sector, companies are using foreign experts
- Most graduates have basic skills, somehow have good design and other related skills yet lack advanced digital skills that is required in the sector
- Graduates can not operate new digital machines used in the sector

iv. Digital Skill Training Need in the Metal Sector



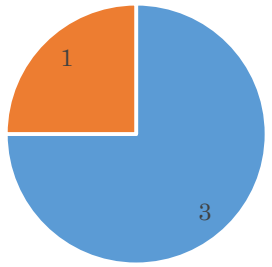


There is no consensus among our respondents on which job position needs which level of digital skill in the metal sector. Managers and professionals need training intervention immediately.

- There is digital training requirement especially in design, and programing and effective use of semi automated digital machines used in the sector
- Semi automated machines are operated by foreign experts. Use of foreign experts to train local staffs on the job are commonly used
- There is occasional in house unstructured on the job training to bridge existing digital skills gaps

¾th of our respondents are planning to upgrade their workforce or employees in the next 12 months.

Are you planning any significant (digital skills) upgrading or re-skilling of your work force, or employees, in the next 12 months?



D. CROSS SECTORAL ANALYSIS

The cross sectoral comparison is based on summary of in-depth interviews made with 16 managers across three sectors

Parameter	Hospitality Sector	Construction Sector	Metal Sector
Digital Skills Importance	• Basic digital skills and Work place digital skills are critically important. • Hotels are hiring ICT professionals for most advanced digital skills. • There is a trend of using outsourcing options • Proficiency in using IDS/ OPERA and digital marketing platforms are critical among star & branded hotels	• Basic digital skills are important for most back office operations • Most of construction sector jobs are operated manually • Workplace and advanced digital skills are partially used in planning, design and project management positions in some companies • There is growing interest to use MS project and ERP software • Construction sector is not using integrated data system	• Basic digital skills are important for most back office operations • Most older metal firms are operated manually. • Recently established metal firms are using semi automated machines that require for more work place and advanced digital skills
Digital Skills Gap	• More gaps are observed in workplace digital skills • There are gaps in basic digital skills • Hotels depend on expatriates for fully operating OPERA/IDS software • There are no local suppliers and support for OPERA software is limited • Wider digital marketing skill gaps are observed	• More gaps are observed in workplace digital skills • The limited investment in corporate data system is limiting the use of big data analytics • There are digital skills gaps in design and project management	• Among firms using semi automated machines workplace and advanced digital skills are not available in the market • Newly established metal firms are completely dependent on expatriate staff to operate semi automated digital machines • They are using on-the –job training (unstructured) and coaching to bridge the gaps in some way.
Level of Satisfaction	• Somehow satisfied in basic digital skills of most employees • Not satisfied in most workplace digital skills proficiency level of both employees and graduates	• Somehow satisfied in basic digital skills of most employees • Among companies using work place and advanced digital skills there are elements of dissatisfaction	• Somehow satisfied in basic digital skills of most employees • Depending on expatriate staff to operate semi automated machines

Remark

- Digital skills need at all levels is increasing among branded and star hotels. More workplace and advanced digital skills are highly in demand in Addis Ababa as compared to out country.
- Digital skills use in construction is very limited . The construction sector has to invest on digital technologies, big database and sector specific software to overcome the current problems related to cost surge, prolonged project completion period and inefficiency in its overall service.
- There is a growing need for using semi automated machines in metal sector whereas the local professionals are not skilled enough to operate it .

3.3 ASSESSMENT: EDUCATION PROVIDER'S PERSPECTIVE

A. DIGITAL SKILL COVERAGE*

SN		Items	Science & Technology Universities		Institutes of Technology		TVET Colleges					
			AASTU	ASTU	BDIOT	JIOT	TEPC	GWPC	CTTI	APC	JPC	BDPC
1	Basic Digital Skills	Operate Computers and Basic Office Machineries										
2		Basic use of MS Office applications										
3		Search for, collect, store data using Internet										
4		Create personal and professional accounts online										
5		Protect digital devices and personal data										
6	Workplace Digital Skills	Operate Sector Specific										
7		Advanced use of MS Office applications										
8		Use Project Management Software										
9		Apply Digital Marketing Tools										
10		Using Point of Sales System (POS)										
11		Participate in Virtual Meeting)										
12		Use Business Intelligence Software										
13	Advanced Digital Skills	Create a Website										
14		Create and Maintain a Computer Network										
15		Undertake Programming										
16		Configure or Modify Firewall and Security Settings										
17		Design, Create and Modify Databases										
18		Create or Design Cloud Computing Solutions										

Legend

Skill is covered in courses for Non-ICT Students

Skill is not covered in courses for Non-ICT Students

* Based on representative responses by ICT Teachers, Department Heads or Deans

Based on interviews made with College Deans, Department Heads and Teachers/Trainers , the following views were reflected on digital skills coverage

Science and Technology Universities

- Both Addis Ababa & Adama Science and Technology Universities (ASTU) are using benchmarked curriculum from Science & Technology universities in other countries.
- Digital skills coverage varies across departments.
- Introduction to computer courses is expected to be covered at high school levels. Yet, gaps among students at freshman level is observable. They are addressing the gap.
- In addition to conventional courses, digital skill courses are under revision to include emerging technologies and artificial intelligence.
- Digital skills coverage largely remains generic. It is tailored to specific department courses not to specific jobs at industry
- Some specific digital skills covered in the classes are not regularly used in the industry

Institutes of Technology

- Use modular curriculum developed nationally
- Digital skills coverage varies across departments
- A total of 4 to 6 courses focusing on digital skills are provided including introduction to computer, C++, and other object oriented programs
- Due to change in educational road map there is ongoing curriculum revision
- Digital skills coverage largely remains generic. It is tailored to specific department courses but not to specific jobs at industries

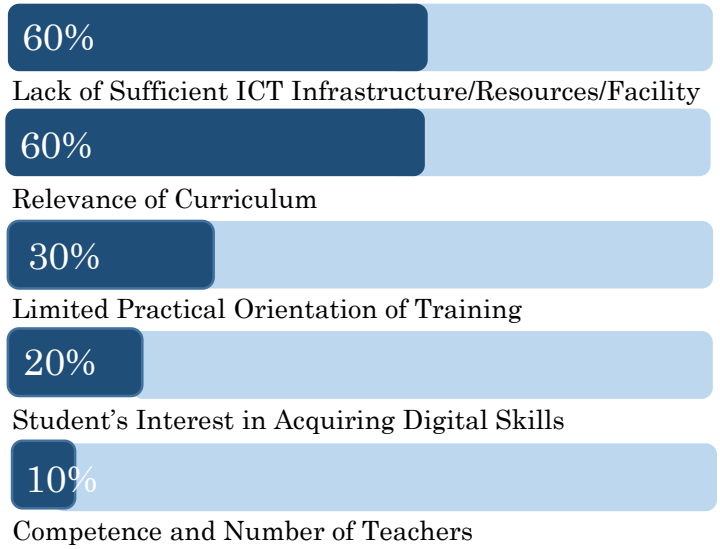
TVET Colleges

- Uses revised curriculum on New Occupational Standard (OS) developed by Federal TVET Agency since 2017.
- The same curriculum is used across all TVET colleges for similar programs
- From 2010 to 2017 courses on introduction to computer were excluded and students directly take one or two subject related advanced digital skills
- The newly revised OS includes introduction to computers and other advanced ICT courses from level 3 to 5.
- Still the digital skills coverage remains generic
- COC assessments are computerized

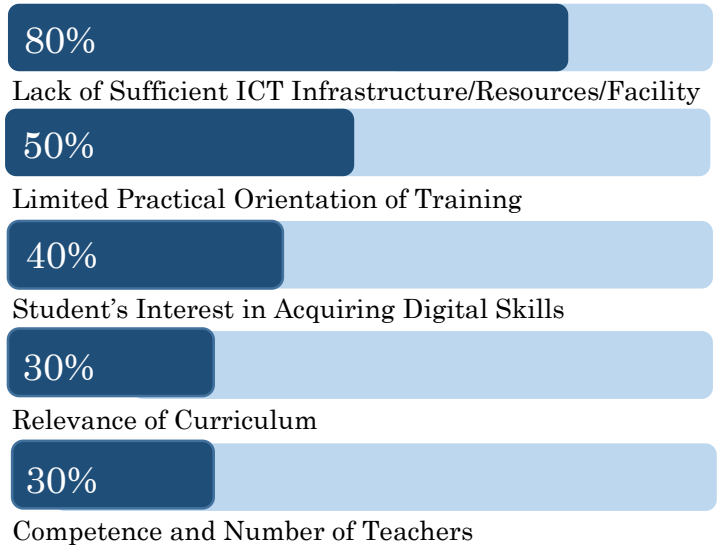
B. CHALLENGES IN DIGITAL SKILLS TRAINING PROVISION

i. By the Type of Educational Provider

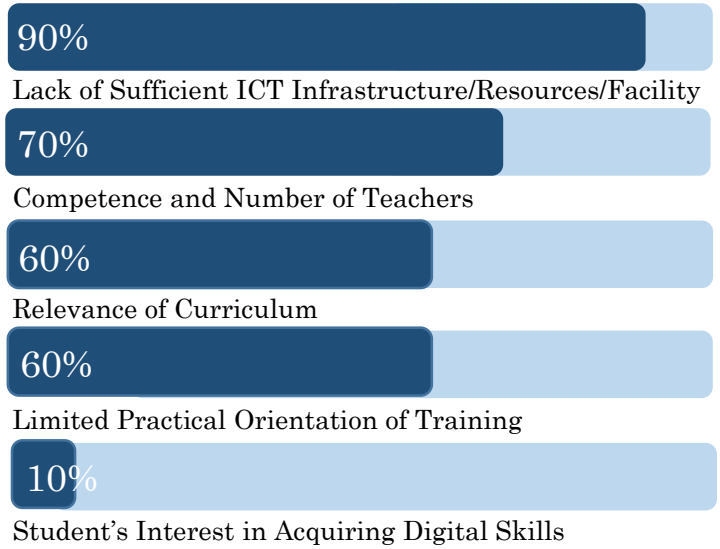
Science and Technology Universities



Institutes of Technology



TVET Colleges



ii. By Location

Addis Ababa

- 80% Lack of Sufficient ICT Infrastructure/Resources/Facility
- 60% Relevance of Curriculum
- 40% Limited Practical Orientation of Training
- 30% Student's Interest in Acquiring Digital Skills
- 20% Competence and Number of Teachers

Adama

- 70% Relevance of Curriculum
- 70% Limited Practical Orientation of Training
- 50% Competence and Number of Teachers
- 50% Lack of Sufficient ICT Infrastructure/Resources/Facility
- 20% Student's Interest in Acquiring Digital Skills

Bahir Dar

- 80% Lack of Sufficient ICT Infrastructure/Resources/Facility
- 60% Relevance of Curriculum
- 40% Limited Practical Orientation of Training
- 30% Student's Interest in Acquiring Digital Skills
- 20% Competence and Number of Teachers

Jimma

- 100% Lack of Sufficient ICT Infrastructure/Resources/Facility
- 50% Competence and Number of Teachers
- 50% Student's Interest in Acquiring Digital Skills
- 30% Relevance of Curriculum
- 30% Limited Practical Orientation of Training

iii. By Roles of Respondents

Teachers

- 80% Lack of Sufficient ICT Infrastructure/Resources/Facility
- 50% Relevance of Curriculum
- 50% Limited Practical Orientation of Training
- 40% Competence and Number of Teachers
- 20% Student's Interest in Acquiring Digital Skills

Department Heads / Deans

- 80% Lack of Sufficient ICT Infrastructure/Resources/Facility
- 50% Relevance of Curriculum
- 50% Limited Practical Orientation of Training
- 40% Competence and Number of Teachers
- 30% Student's Interest in Acquiring Digital Skills

Major Challenges Identified in Relation to Providing Digital Skills Training & Education

Challenges at Adama S&T University

- Both number of labs and desktop computers are adequate. But there is shortage of high performing computers
- All labs and offices are internet connected
- Limited internet bandwidth; limited digital cloud applications
- There are variations among teachers commitment, delivery method and practical exposure to industry which in turn causes variations in the course delivery

Challenges at Addis Ababa S&T. University

- The ICT infrastructure is considered good enough
- Limited use of authorized software for training due to awkward processes of purchasing
- Limited practical industrial exposure among teachers
- Most of the time, lab sessions are end-loaded and do not go in parallel with theoretical classes

Challenges at Bahir Dar IOT

- Revising harmonized curriculum takes longer time and process
- ICT lab is somehow adequate to support digital skills training
- Power outage, system failures and internet interruptions are common challenges
- Not all workshops are fully connected and integrated with internet services
- Students use of social media is becoming disturbing habit

Challenges at Jimma IOT

- Revising harmonized curriculum takes longer time and process
- Teachers are more equipped with generic know-how but may lack practical experience and limited exposure to the new developments in the industry
- Power outage, system failures and internet interruptions are common challenges

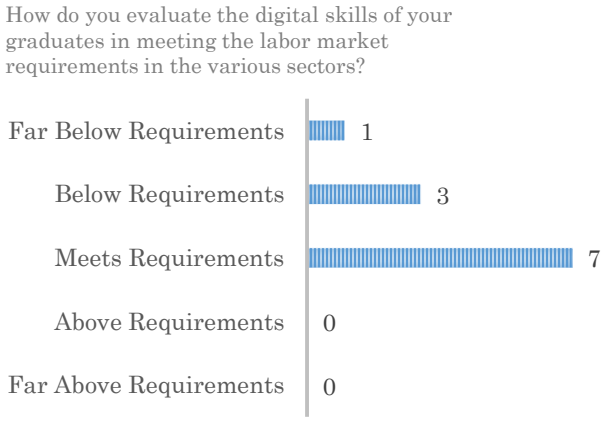
Challenges at TVET Colleges (all locations combined)

- Except at Catering Institutes and Wingate college, where there are relatively better investments on ICT infrastructure, all other TVET colleges lack basic computer lab to offer digital skill trainings
- The older curriculum has overlooked digital skills related courses
- Shortage of teachers and limitation of digital skills is common barrier to all
- Due to increased number of students joining the college, the limited budget is used for consumables. Hence, there is serious shortage of budget for investment in ICT infrastructure
- Getting companies for apprenticeship is so difficult

C. MEETING LABOR REQUIREMENTS

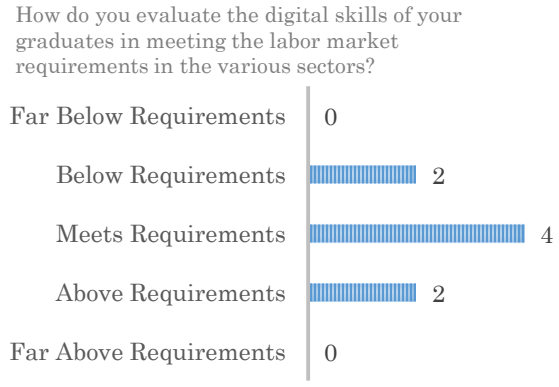
Views at Science and Technology Universities

- There were no formal digital skills survey conducted
- Deans and Department Heads strongly believe most of their graduates meet digital skills requirements at industries with short bridging courses
- Deans and Dept. Heads believes there are more probabilities of digital skills gaps and mismatches among graduates. This is mainly due to generic nature of the courses, variations during delivery, limitations in practical orientation among students, and quality of apprenticeship
- Students lack sufficient digital skills to operate specialized software used in industries



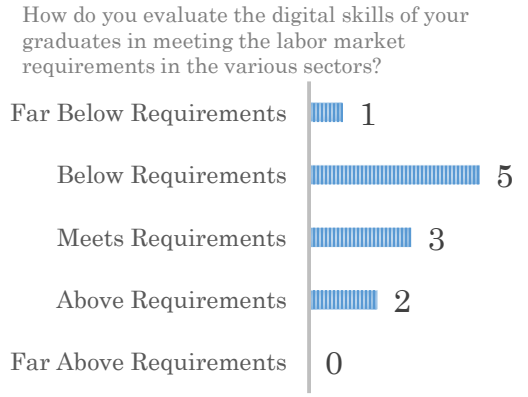
Institutes of Technology

- Employment surveys and tracer studies have been conducted
- No digital skills survey were conducted
- Deans perceive 90 to 95 % of their graduates meet the digital skills requirements in the market
- There are students who develop specific software for university use.
- Teachers believe most of the students meet the digital skills requirements of the labour market
- Deans and teachers yet believe there is a need to arrange digital skills bridging (training) courses for their graduates based on specific industry requirements



TVET Colleges

- All deans, department heads and teachers unanimously believe that Local industries digital market requirements were not included in the curriculum design except at Catering institutes
- At hotel and catering institutes their graduates are viewed to meet basic and some workplace digital skills requirements. Yet they are not trained on OPERA and IDS software at schools.
- Cross checked views from TVET college indicate majority of the graduates do not meet digital skills requirements of the labor market
- Almost all college deans feels the newly introduced OS requires revision based on contextualized needs of local industries in the country at large.



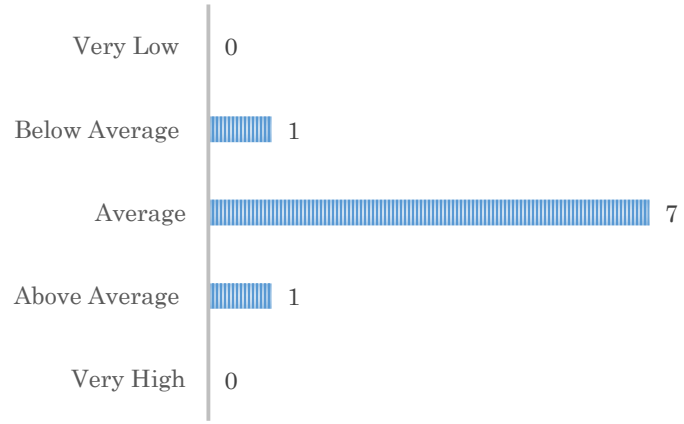
D. CAPACITY ASSESSMENT

i. Adequacy of the Curriculum Content

Science & Technology Universities

- Both Universities have better discretion to revise the curricula
- Still, the existing curriculum is not based on specific industries digital skills requirements
- Curriculum use is not supported by detailed syllabus to standardize the delivery contents
- The use of elective courses in digital area should match industry requirements

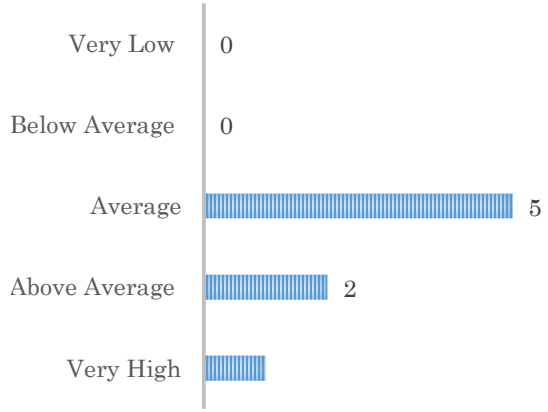
ADEQUACY OF THE CONTENT OF THE ICT CURRICULUM TO MEET THE REQUIREMENTS OF THE LABOR MARKET (STU)



IOT Universities

- Not adequately based on industries digital skills survey
- It is modular, harmonized and nationally coordinated.
- Curriculum use is not supported by detailed syllabus to standardize the delivery contents

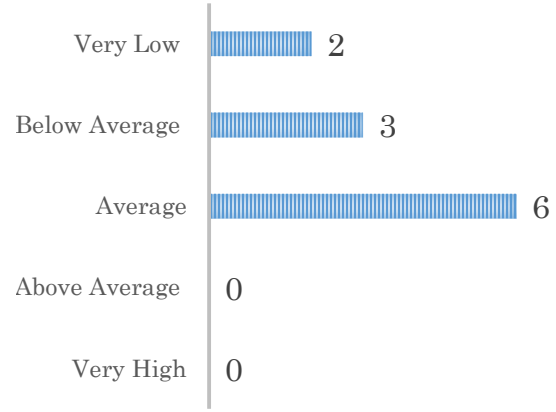
ADEQUACY OF THE CONTENT OF THE ICT CURRICULUM TO MEET THE REQUIREMENTS OF THE LABOR MARKET (IOT)



TVET Colleges

- Overlooked ICT related courses
- Industry actors were not sufficiently represented during the process of curriculum development
- The revised OS missed adequate representation of industries and it failed to reflect contextual realties in the country.

ADEQUACY OF THE CONTENT OF THE ICT CURRICULUM TO MEET THE REQUIREMENTS OF THE LABOR MARKET (TVET)

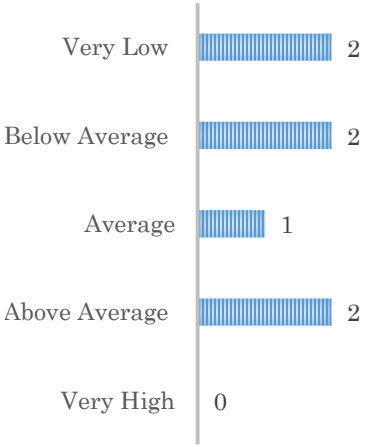


ii. Adequacy of ICT Infrastructure

Science & Technology Universities

- Number of labs and desktop computers are at least good enough to support digital training
- Internet speed, reliability networking issues are a challenge
- Use of authorized software and lab management are also challenges

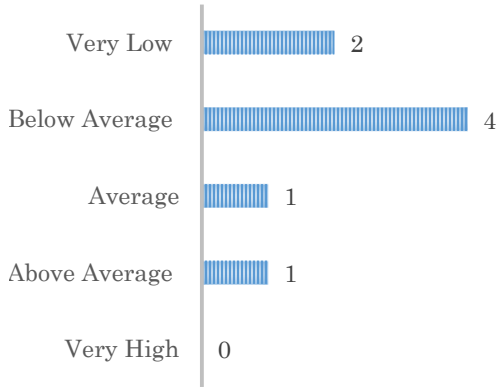
ADEQUACY OF ICT INFRASTRUCTURE AVAILABLE AT THE INSTITUTE TO MEET THE REQUIREMENTS OF THE LABOR MARKET (STU)



Institutes of Technology

- Growing number of student intake is creating lab & PC shortage
- Internet speed, reliability and networking issues are challenges

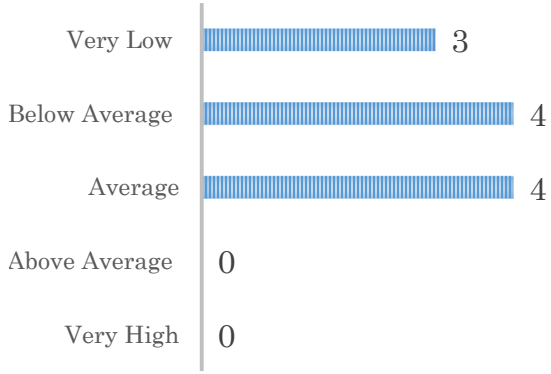
ADEQUACY OF ICT INFRASTRUCTURE AVAILABLE AT THE INSTITUTE TO MEET THE REQUIREMENTS OF THE LABOR MARKET (IOT)



TVET Colleges

- TVET colleges and programs were opened without basic investment on ICT infrastructure and facilities.
- Internet & desktop or laptop to all teachers may be considered as luxury.
- The limited available budget is largely used for consumable purchase

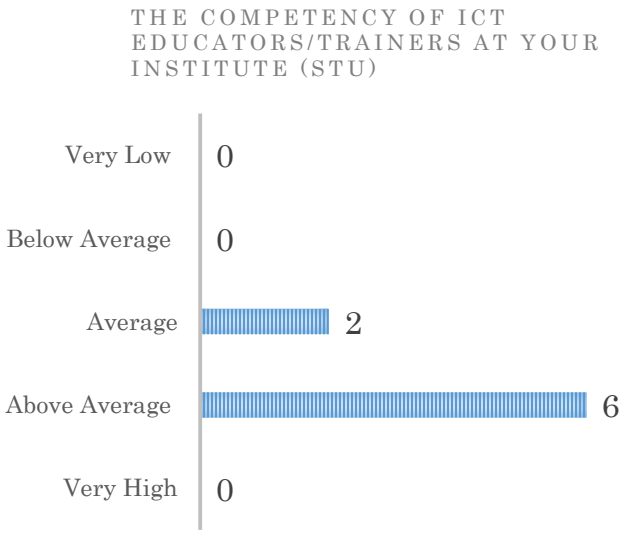
ADEQUACY OF ICT INFRASTRUCTURE AVAILABLE AT THE INSTITUTE TO MEET THE REQUIREMENTS OF THE LABOR MARKET (TVET)



iii. Competency of ICT Educators/Trainers

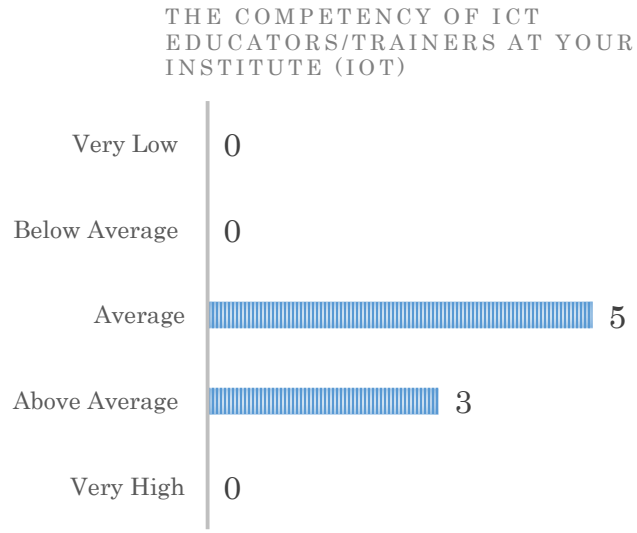
Science & Technology Universities

- Most teachers lack practical industry exposure
- No formal digital skills certification training



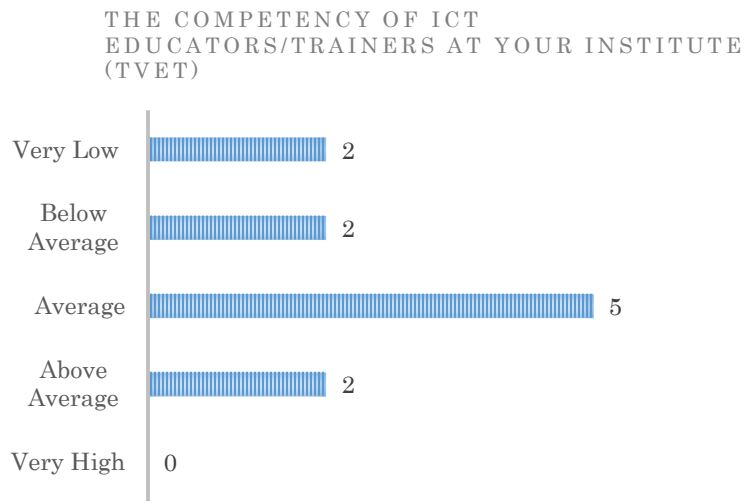
IOT Universities

- There is occasional shortage of teachers
- Most teachers also lack practical industry exposure



TVET Colleges

- There is inadequate culture of digital tools usage.
- Wider digital skills gaps may be observed. The emphasis is on other technical skills competence



3.4 EXISTING & PROSPECTIVE INITIATIVES

A. SECTORAL INITIATIVES TO FILL THE GAP

Present-day digital skill initiatives were obtained based on interviews made with managers of three different sectors, mainly professional associations of hotels, construction and metal industry development institutes. The cross checked views on the initiatives to fill the digital skills gaps are presented here below: -

Hospitality Sector Limited initiative	• Only branded hotels invest more on digital technologies and use OPERA / IDS software. These hotels often employ digitally skilled and experienced foreign experts. There is no sectoral initiatives on digital skills trainings. Hotel owners' association is organizing trainings on soft skills but not on digital skills training or related programs to support the sector.
Construction Sector Limited initiative	• Generally there is very limited use of digital skills and technologies in the sector. Some private and public enterprises are planning to make investment on full package licensed ERP system modules. Ethiopian Construction Work Corporation is planning to invest more on huge data center, networking and other digital technologies. Intervention or Support from Contractors Association on digital skills and technology is very limited .
Metal Sector Limited initiative	• Recently established metal firms are using semi digital machines operated by foreign experts . There is no other digital skills training or support available except the Ethiopian Metal Industries Development Institute's limited effort to support the sector on digital skills development.
Educational Providers There are initiatives	• The importance of digital skills has been comprehended by most educational training providers. However, the curriculum, ICT infrastructure, teachers competence and incentives for private sector to meaningfully engage in a dual training program are major challenges. These problems are more prevalent in most vocational colleges. • There is an ongoing revision of the Ethiopian Educational Development Roadmap, current curriculums and the new OS for TVET colleges. However, these initiatives have not yet sufficiently addressed the demand and supply function of the market demand for the digitally skilled manpower. • There is training support and initiatives in areas of recent technologies for Science and Technology Universities from MiNT in collaboration with MOSHE • MOSHE has introduced digital literacy training for communities that focuses on basic digital skills in collaboration with many universities.

B. NATIONAL INITIATIVES & FRAMEWORKS

i. National Digital Policy Priorities

Presented below are national level initiatives, priorities, and gaps identified through desk research and interviews with pertinent national stakeholders and policy makers.

National Level Initiatives

- National digital literacy initiative to reach 50,000 community members
- National Proposal by MiNT to reach 70% digital literacy by 2025
- Homegrown Economic Reform
- Ten years National Economic Development strategy(draft)
- Certified Digital Skill training in Collaboration with Microsoft, IBM, Huawei, CICISO and Oracle
- MOSEH has recently launched CPD for teacher on digital skills
- eGovernment Strategic Implementation Plan 2020 developed for Ethiopia by KPMG East African consulting group
- Memorandum of understanding was signed with Alibaba group on "Electronic World Trade Platforms"
- Strategic plan on digital certification for ICT professionals from 2018-2022 were completed
- Ethiopian Science, Innovation, and Technology Policy under revision
- Ethiopian Educational Development Roadmap (2018-2030

National Digital Policy priorities

There is no separate national digital policy developed so far. However, according to the ten years national development plan & homegrown economic reform agenda (2020-2030) , the national priorities are:

- Diversification, technological upgrading, and innovation
- Inclusive digital economy
- Promoting e-commerce and digitization of the financial and logistic sectors;
- Developing ICT parks and fostering the development of the ICT ecosystem;
- Investing on ICT literacy and advanced vocational and tertiary education

ii. National Digital Policy Gaps

Based on desk research and interviews:

- In general there is no national level assessment conducted on national digital skills demand and supply.
- Absence of national digital policy framework
- The Ethiopian Educational Development Roadmap did not fully integrate ICT education from elementary level, unlike many other African countries
- The revised OS and harmonized curriculum did not sufficiently engage the industries.
- The dual training system did not clearly indicate the role, incentives and obligations for private sector engagement.
- Institution's lack of adequate capital to invest on ICT infrastructure before running a training program
- Lack of clear policy incentives for private sector investing on the use of digital technologies
- Lack of national initiatives on digital skills bridging and upgrading training for both graduates and employees in the industry

The overall digital ecosystem is characterized by the following points: -

- Wide digital skills divide between sectors, Educational institutions and geographical locations
- Relatively low level of digital skills use awareness among most industries
- Although national development plans and economic reform policies have understood the critical importance of digital technology, there is limited national preparedness in developing the desired digital skills training to address the demand in the labour market

iii. Key Actors: Review of Roles and Functions

Review of Roles and Functions of key actors are briefly presented here below

Key Actors	Major Roles and Functions	Learning Points & Insights
MiNT	• Formulate science technology and innovation policy, coordinate national actors in areas of science technology and innovation • Assist and coordinate diverse national initiatives on mobile payment, Tech SMEs , e-Government, e-Tax , e-Customs , Digital ID, e-commerce and digital literacy among others	• Unlike similar ministries, in Africa there may be a need to establish ICT Authority • National digital technology and skills need assessment and strategy to design and meet digital skills need requires immediate attention
MOSHE	• Formulate and oversee national higher learning institutions educational and training policy • Initiated digital literacy training program, recently digital skills upgrading and certification initiatives	• Very cognizant of digital skill gaps and the importance of ICT skills for economic development. Yet, MOSHE has not conducted digital skills demand and supply gap analysis, curriculum is not revised accordingly, and blamed for not adequately engaging the industries in the curriculum development & dual training Programs
ETHERNET	• Founded in 2009 under MOE for supporting the public higher education institutes with primary aim to build stable, reliable, flexible, modular, and scalable network infrastructure across the country and connect to the global research community • It focuses on (DNS hosting, Web hosting, Shared hosting, identity management, digital repository, graduate verification and other technical supports • It provides Cloud support for higher learning institutions	• ETERNET could provide good support for digital skills training • It facilitates training support in collaboration with Microsoft, IBM, Huawei, CISCO and Oracle. • It also facilitates ICT related workshops in collaboration with global tech giants.
HERQA	• HERQA is structurally placed under Higher Education Strategy Centre (HESC) • It performs accreditation & quality audit tasks • Oversee curriculum design and its implantation	• Due to lack of national digital skills training policy or lack of digital policy framework HERQA's role in areas of digital skills assessment is limited.
HESC	• It was founded to assist higher learning institutions in strategic matters. Very aware that digital skill demand and its importance; not involved in curriculum development; and has no idea on the existence of digital policy/ framework	• HESC is supposed to conduct assessment on national digital skills requirements, formulate strategy and mobilize other sectors or ministry offices to influence the national policy towards ICT.
Associations	• Contractors association, hotel owners association and other pertinent associations can play pivotal role in supporting the industries. However, currently they are not engaged in digital skills initiatives or related activities.	• Can play a pivotal role in digital skills training if guided with engaging business model professional associations (both bridging and upgrading sector specific training)
Africa118	• It is a marketing company that started operation in Kenya in 2010. • It works on business directories, digital marketing, and business data. • It focuses on digital marketing and website development. It also offers digital skills training in partnership with google focusing on the youth, job seekers, SMEs and cooperatives	• It can be helpful digital skills training partner

4. RECOMMENDATIONS

4.1 RECOMMENDATIONS FOR GIZ INTERVENTION

Based on the current realities and scenarios in the three sectors, the following recommendations are suggested for GIZ intervention:

General recommended for intervention

- The use of digital technology, investment, and skills requirements in branded & star hotels is becoming more critical. Thus, give the sector top priority as compared to both construction and metal sectors.
- Conduct digital skills capacity building support programs that mainly focus on workplace digital skills, full package trainings on the use of property management systems such as OPERA and IDS with focused trainings for ERP systems. Moreover, give attention to digital marketing trainings.
- Cross-cutting digital skills identified by this assessment such as using project management software, using business intelligent software, video conferencing, digital marketing, and protecting digital devices deserve special consideration in all the three sectors. .
- Develop special initiatives that focus on raising the readiness of companies in construction and metal sector in using digital technology.

At a national level, GIZ should intervene as presented below:

- Organize periodic platforms on digital technology use, investment on digital technologies and on the necessity of digital skills capacity building initiatives, in collaboration with major stakeholders.
- Encourage sectorial associations such as hotel owner's association, contractors association , and associations in metal industry sector in promoting on the need for digital technology use, investment on digital skills, and above all digital skills capacity building training. It is also imperative to engage pertinent institutes supporting the development of hospitality, metals, and construction sectors in the process.

Based on the current realities and scenarios in the three sectors the following recommendations are suggested for GIZ intervention

Sector	Digital Skills Levels	Target Groups: Selected Lists of Digital Skills	Existing Employees	Graduating (in transition)	Potential Intervention	Intervention Modality	Potential Players
Hospitality	Basic	• Operating digital devices • Professional internet use • Social media use • Digital Security • Trouble shooting			• Organize digital technology Use and investment awareness platforms • Facilitate short-term, customized trainings • Strengthen the existing On-the-Job trainings in target organizations • Support private providers of digital skill trainings	• Co-training • Projects • On-line Certification • Support training manual preparations and provide TOT for internal trainers	• Hotel owners Associations • Private Training providers • Ministry of Tourism and culture • CTTI
	Workplace	• Apply MS office • Use of IDS/ OPERA / ERP/ for both front & back office operation • Use of digital marketing platforms and social media for professional use					
	Advanced	• Use of digital marketing platforms on cloud • Full package use of IDS/ OPERA/ERP for all operations					
Metal	Basic	• Operating digital devices • Professional internet use • Digital Security • Trouble shooting			• Organize digital technology Use and investment awareness platforms • Facilitate short-term, customized trainings • Strengthen the existing On-the-Job trainings in target organizations • Support private providers of digital skill trainings	• Co-training • Projects • On-line Certification • Support training manual preparations and provide TOT for semi automated digital devices commonly used in the sector	• Ethiopian Metal Industry Development Institute • Educational providers • Ministry of Industry
	Workplace	• Apply MS office • Operation of semi-automated machinery • Using design and programing software • MS project ,Business intelligence software, Video Conferences					
	Advanced	• Use cloud service and apply data analytics					
Construction	Basic	• Operating digital devices • Professional internet use • Digital Security • Trouble shooting			• Organize digital technology Use and investment awareness platforms • Facilitate short-term, customized trainings • Strengthen the existing On-the-Job trainings in target organizations • Support private providers of digital skill trainings	• Co-training • Projects • On-line Certification • Support training manual preparations and provide TOT for internal trainers	• Contractors Association • Ethiopian Construction Project Management Institute • Educational providers • Ministry of Industry
	Workplace	• Apply MS office • Use of Video Conferencing Software • Use Project Management, ERP, Business Intelligence Software • Use of planning , designing ,and programing software					
	Advanced	• Advanced use of Data Analytics • Use of cloud computing platforms					

Specific recommendation for GIZ across the three sectors:

Specific recommendations for hospitality sector :

- Provide trainings on advanced digital skills for hotel managers, marketing and sales, as well as ICT professionals in Addis Ababa.
- Provide workplace digital skills for supervisors, department heads, receptionists and kitchen operators
- Provide basic and workplace digital skills training for hotels located in Bahir Dar.
- Support initiatives that focus on improving the quality of internship (dual training) through introducing both incentives and obligatory measures
- Assist private training providers on various short term bridging and upgrading digital skills through co-creation model by bringing hotels managers, supervisors , training/ educational providers, supplier agents hotel owners' association and Ministry of Tourism & Culture on board.

Specific recommendations for metal sector

- Provide TOT training for selected industry digital / technology / ICT experts on CNC machines and cross cutting training areas identified prior.
- Support online certification trainings of selected experts from Metal Industry Development Institutes (capacity building program) on cross cutting digital skills training areas and commonly used semi automated machines used in the metal sector

Specific recommendation for construction sector :

- Work on increasing the digital awareness of contractors through introducing both incentives and mandatory compliance methods on the use of digital technologies. (For example, digitalizing bid tenders, making use of integrated ERP, making MS project use mandatory & giving tax incentives for investing on digital technology and digital skills).
- Thus, GIZ has to advocate for digital technology and skills application mandatory legal requirement formulation and its enforcement .
- GIZ has to work towards raising the awareness on the national necessity to support construction sector investment, big data center and networking systems that requires integrated cooperation approaches and investment.

Based on the assessment in the educational sector, the following recommendations are suggested:

Recommended interventions at national level

In the short term :

GIZ can organize consultative workshops that include ICT teachers, Directors, University Management, Board members, HERQA, MOSHE, ETHERNET, HESC and other pertinent stakeholders to create shared understanding on the current realities and prospects of existing digital skills demand and supply in the country from both Universities and TVET colleges.

GIZ should promote the necessity and urgency of :

i. Conducting national level digital skills demand and supply assessment.

ii. Redefine occupational standards based on assessment result (coordinating role to bring national players together).

iii. Suggest revision on curriculum to integrate ICT across all educational levels based on developed national digital framework.

iv. Promoting the development of national digital framework

In the long term GIZ should promote

- Revision of the curricula based on clearly defined sectoral and national occupational standards digital skills requirements
- Promote the integration of ICT courses across all educational levels (from KG to University)

Recommended interventions for Universities

- Organize digital skills certification TOT for teachers teaching various digital skills courses
- Promote the necessity for universities to regularly invest on online digital skills certification for ICT educators.
- Promote the certification of teachers on sector specific digital skills training requirements
- Organize revision of syllabus on digital skills courses
- Promote investment on ICT infrastructure upgrading
- Provide support on the preparation of digital skills training manuals to ensure quality/standard of trainings at universities
- Support the universities in reassessing the challenges in the internship and externship initiatives
- Support University –Industry –Government collaboration through organizing joint research on digital skills needs and practical interventions

Recommended interventions for TVET Colleges:

- GIZ should provide support on ICT infrastructure (computer lab, software licensing)
- Promote regular budget allocation for ICT infrastructure investment by MOSHE
- Provide TOT training on IDS, OPERA, ERP, and digital marketing training for CTTI .
- Promote the necessity to revisit the OS and digital skills considered in the revised OS.
- Making online digital certification as mandatory requirement to teach advanced digital skills courses.

4.2 RECOMMENDATION FOR DEVELOPMENT OF DIGITAL LITERACY FRAMEWORK

Based on the assessment results and conducted desk research, the following is suggested for the development of a national digital literacy framework :

The Current Realties of Digital Ecosystem

The current realities of Ethiopian digital ecosystem is somehow characterized by the following features:

- Lower but improving internet penetration and digital technology use as compared to neighboring African countries
- Wider digital divide among sectors, as well as between Addis and upcountry locations
- Limited digital technology use or readiness among industries
- Lack of national digital literacy framework
- Lack of clearly defined occupational standards that address digital skills requirements
- Lack of national level digital skills demand and supply assessment
- Limited investment on ICT infrastructure in the overall educational providers
- Lack of ICT integration with the educational system (from Kinder Garten – University)
- Limited coordination among digital ecosystem stakeholders
- Limited initiatives on digital literacy intervention
- Growing need for sector specific basic and workplace digital skills demand

Important Considerations During the Development of Digital Framework

- Creating and sustaining digital skills awareness among digital ecosystem stakeholders
- Identifying key actors in the digital ecosystem
- Institutional capacity and continuity of initiatives (Effective digital skills provision is reliant on well-functioning organizations that operate within stable and supportive conditions)
- Diverse and well-managed partnerships: (Successfully combining public and private interests while maintaining a shared vision remains a challenging feature of work in this area.)
- Context-specific planning and provision (initiatives have to be tailored to meet the needs of target beneficiaries and respond to local contexts. It is also suggested to design inbuilt evaluation systems based on evidence)
- Scaling up successful initiatives (start small or local scale with activities that are relatively easy to adjust)
- Bridging formal and non-formal digital skills provision
- Enhancing the digital competencies of teachers
- Applying existing technologies in innovative ways (to fully harness the potential of existing digital tools)
- Promoting forward looking digital skills perspective (tracking the dynamism as well as current and future trends in digital ecosystem)

Recommendations on Developing Digital Literacy Framework

In the short-term it is recommended to focus on:

- Introducing digital certification programs for graduates (focus on tailored basic and work place digital skills or use online certification options)
- Initiate and scale up digital literacy for life (application of digital skills) that include information literacy, health literacy, agriculture literacy , financial literacy and government literacy initiatives)

In the long-run it is recommended to promote:

- Integration of ICT courses across all level of education starting from bottom up
- Initiatives to promote & develop society's ability to not only act digital (able to use digital technologies)but also to think digitally (applying creativity and innovation in digital skills & technology use)

Short-term Action Recommendations

	Digital Skills for Life	Educational Institutions			Transition (Education to Work Transition)	Workplace
		Schools	TVET	Universities		
Basic Digital Skills	• Focus on basic digital literacy initiatives that covers (information literacy, health literacy, agriculture literacy , financial literacy and government literacy initiatives) • It should focus on basic skills • Customize and standardize the training initiatives				• Digital skills certification (mainly online certification)	• On- the- Job training • Coaching
Workplace Digital Skills					• Provide tailored sector specific structured On-the-Job training	• Provide tailored sector specific structured On-the-Job training and Coaching
Advanced Digital Skills						

Enabling Environment
[Government agencies, non-educational providers, sectoral associations, chambers, etc]

Long-term Action Recommendations

Digital skills for life	Educational Institutions			Transition (Education to Work Transition)	Workplace
	Schools	TVET	Universities		
• Focus on basic digital literacy initiatives that cover (information literacy, health literacy, agriculture literacy , financial literacy and government literacy initiatives) • focus on basic skills • Customize and standardize the training initiatives • Extend the initiative to more towards creating 'think digitally' society	• Incorporate basic digital skills in school curriculum to teach students basic digital skills such us operating, communicating handling information and content, transacting, problem solving as well as being safe and legal online and using ICT devices. • Build capacity of teachers to provide basic digital skills • Make basic ICT infrastructure available at schools	Design curriculum to teach occupation specific digital skills useful for the purpose of smoothly performing regular and periodic tasks/duties in organizations (Such as programing software, digital marketing tools,	Design curriculum to teach occupation specific digital skills useful for the purpose of smoothly performing regular and periodic tasks/duties in organizations (Such as programing software, digital marketing tools,	• Certifications (focus more on workplace and advanced digital skills) • Encouraging self learning platforms, online community network	Skills upgrading focused using • On-the-Job training (structured approaches) • Coaching • Integrate digital skills in career development • Enhance creative digital thinking

Enabling Environment

[National and local government agencies, education and training providers, sectoral associations, chambers, charities etc]

- Developing a digital skills strategy
- Preparing the workforce for digital transformation
- Building learning ecosystems that adapt to changes in digital skills demand and support individuals
- Analyze the future of work and digital skill requirements

5. ANNEXES

5.1 Mapping of Digital Training Initiatives

5.1.1 Addis Ababa

S.N	Initiative	Lead Organization	Target Group	Trainings Offered	Digital Skills Level Addressed	Pricing Category	Background Description	Address
1	Short Term Digital Financial Analysis Program	Virtual Training Center	Business Professionals	Business Digital Skills Development Focusing on Finance (e.g. Peachtree)	Workplace	ETB 3900/Person	The Centre is providing digital skills primarily for bussiness men and professionals. The trainings are short terma. And the objective of the trainings is to enhance capacities of Individuals and indirectly enhancing digital capacity in the business sector.	2519 30 10 05 77/79 https://www.facebook.com/pages/category/School/Virtual-Trainning-539967096041597/
2	Degree Programs, TVET Program, Short Courses	Microlink IT College	Qualified Students	Degree: Computer Engineering, Computer Science TVET Program: IT Short Courses: CISCO CCNA, Microsoft Server, Oracle Database, Advanced Website Development, Android App Development	Workplace and Advanced	ETB 100-160/ credit hour	Established in 1998, MicroLink Information Technology College is an ICT focused high-profile pioneer private higher-learning institution in Ethiopia. Having its main campus located at Addis Ababa, Ethiopia.The College is Training students in Digital skills in Degree and Diploma level.	0911686765, +251118684849 http://microlink.edu.et/
3	Faculty of Informatics & ICT Development and Support Unit (ICT Unit)	St. Mary's University	Qualified Students (High school completion, First Degree)	Data analysis using data science and data mining techniques, mobile and pervasive computing, computer graphics and image processing, natural language processing and computer and network security.	Workplace and Advanced	ETB 168-170 per credit hour	The university is providing Degree courses on two disciplines (Informatics and Computer science) for qualified students for further education and qualification	Tel.0115 53 80 20/0115 53 80 17 https://www.smuc.edu.et/
4	Graduate Programs, Undergaduate Programs, TVET Programs & Advanced & Professional Short-Term Trainings	CPU Business and Information Technology College	Qualified Students & Professionals	Master of Software Engineering, Undergraduate Programs (Computer Science), Advanced Professional Short Term Trainings: IFRS, Stastical Packages: SPSS, STATA, Research Methods for Software Application	Basic to Advanced		Computer Professionals United (CPU) is one of the premier Information Technology Companies in Ethiopia established by a group of high caliber and dedicated ICT professionals with the aim of promoting computer technology. Its establishment dates back to 1992, when computer technology was relatively new to the business and service communities of the country. The joint efforts and optimism of these professionals, who were inspired to fill the glaring gap, set up CPU Computer Training Center to provide short-term computer training and consultancy services.During the last twenty three years of its existence, the center has trained 21000 plus trainees drawn from over 375 public and private institutions.	+(251) 011 156 5039 / +251 938 01 02 03 - 911480983 https://www.cpucollege.com/

S.N	Initiative	Lead Organization	Target Group	Trainings Offered	Digital Skills Level Addressed	Pricing Category	Background Description	Address
5	Diploma Trainings & Short Term Trainings	Infonet College	Qualified Studenst and Professionals	Short and Long term (Diploma) Trainings - Programming language and professional software (autocad, archicad, eaglepoint) - Programming (primary to Advanced) and (SPSS, STATA)	Basic to Advanced		The institute was founded in 1995 by a team of well-experienced professionals in the fields of Computer Science, Business and Social science. It trains professionals in information and communication technology. Infonet College was born out of the Infonet Computer Center, a Private Limited Company established in 1994 and incorporated in Ethiopia. Infonet College offers both long and short term trainings and consultancy services on various fields. So far, it has trained over 50,000 trainees from government, non-government and private organizations.	911203247/ 011 277 4729
6	Degree Programs, TVET Program	Rift Valley University	Qualified Students	Computer science, Information Technology, Database and Hardware	Workplace and Advanced	ETB 175/crideit - for TVET 450/month	Rift valley University currently training students in Degree and TVET level from 2-5 years in digital Skill development in Database and hardware and Computer science.	+251-118-12-11-40/ 0978557645
7	Short Term Technical Programs	Satcom Technology Institute	Anyone Interested	Application Software, Antivirus, Network Management and IT Maintenance	Worplace & Advanced	ETB 750/month	Practical Training in the area of Technology / focused on Maintenatce and Application, Software and Antivirus	911548383 http://satcomethiopia.com/
8	Vulnerable Women and Young People Leadership and Business Skill Development	DOT (Digital Opportunity Trust) Ethiopia	Young Entrepreuners	Business Skill (Entrepreuner skill) and Life Skill	Basic Digital Skills (Introduction to Computer and Communication)	Free	DOT Ethiopia is committed to creating a world shaped by young social innovators who have the tools, knowledge, and networks to create opportunities and transform their own communities. We support youth to become innovators and leaders, and to create and apply digital solutions that have positive impact in their communities.	251 116 673 259 ethiopia.dotrust.org
9	Computer Training for Underpriviledged Youth (8 Years Program)	Global Youth IT	Underpriviledged Adolescents	Year 1 - Intro to Computers and Typing/Word Processing Year 2 - Operating Systems and Common Applications Year 3 - Server Software, Networking, Security, and Remote access Year 4 - Internet/Intranet/Extranet	Basic to Advanced	Free	Our mission is to advance the lives of underprivileged youth through computer training. The goal is to turn impoverished (yet very talented) girls and boys into IT professionals after 5 to 7 years of after-school program attendance. Our pilot program in Addis Ababa, Ethiopia began in 2012 with a select group of “street kids” (boys and girls) between the ages of 10 – 14. While education is the core of our work the net result is that the status quo of illiteracy, poverty, slavery, sex crimes, and (for many girls) arranged marriages, will be replaced with well-rounded contributors to society. The IT training will prepare these vulnerable teens to use a unique set of computer skills in a corporate environment, granting them access to jobs and income that will result in stable lives.	Abel T. Sandman Executive Director/Founder asandman@globalyouthit.org globalyouthit.org

S.N	Initiative	Lead Organization	Target Group	Trainings Offered	Digital Skills Level Addressed	Pricing Category	Background Description	Address
10		Server Computer - Education & Training Center	Work Force	Programming, Microsoft office, Basic Computer and Professional IT skills	Basic to Advanced		Server computer - Education and Training Centre is building the capacities of interested individuals on different type of digital skill development, mostly on short term trainings/ from Introduction Computer to Advanced level Programming Language	09 11 41 55 32
11	Degree Programs	Unity University	Qualified Students	Computer Science	Advanced	ETB 315/CH	Unity University is teaching Digital Skill development and providing BSc in Computer Science	251-11-629-8163/651-2722, 011 629 8154
12	Graduate Program and Short Term Trainings	American College of Technology	Qualified Students	MSc: Computer Science, Short Term Trainings: Cyber Security, Data Science, MS SQL Server Administration, MS Business Intelligence, MS Share Point, Cloud Computing	Workplace & Advanced		ACT has a vision to be a preferred center of excellence for providing high quality postgraduate programs in business and technology fields in the horn of Africa. Governed with the mandates in prescribed in Proclamation 650/2009, ACT provides relevant and quality higher education to enable productive lives, conduct research and support the community through professional engagements and use of modern teaching and learning approach. ACT prepares graduates to rapidly evolve into high business flyers and entrepreneurs that assume key management and leadership positions in a globally competitive world. The values of ACT are pursuit of knowledge, academic excellence, academic freedom and professional integrity, team work and partnership with all stakeholders.	251 118-124-488 http://www.actamericancollege.com/
13	Gebeya Training	Gebeya Academy	IT Professionals, IT Graduates, Freelancers, Women interested in Programming	DevOps Engineering, Mobile Application Engineering, Web Front-End Application engineering, Web Back-End Application Engineering, UI & UX design Engineering	Advanced Training	3000-4000 per month for 6 months	Gebeya means marketplace in Amharic Ethiopia's national language. Its vision is to be the premier software engineering and IT training academy in Africa, while becoming the number one global IT services marketplace that matches African IT talent with clients across Africa and the rest of the world. Our purpose is to produce African IT talent and provide an online IT services marketplace for the global business market, expanding IT capabilities for our students; increasing availability of IT talent, reducing IT operational costs and eliminating technology hardware and software needs for our clients; and increasing opportunities for our IT professionals.	Woreda 02, Sinan Building 2nd Floor, Bole Subcity, Addis Ababa, Ethiopia Email: info@gebeya.com gebeya.training

S.N	Initiative	Lead Organization	Target Group	Trainings Offered	Digital Skills Level Addressed	Pricing Category	Background Description	Address
14	CRISP Center for Research and Industrial Staff Performance	Crisp Ethiopia	Technocrats	AutoCAD Java (J2SE) CAD / CAM Industrial Hydraulics Industrial Pneumatics Mechanical Maintenance Power Electronics & Drives CCNA (Routing and Switching) Oracle Database (SQL and PL/SQL) Oracle Database (SQL and Administration) Electrical Control & Relay Logic Application Multimedia Presentation Development using Powerpoint	Advanced		The centre offers Training for the Industry Personnel, Government Staff and Faculties of Educational Institutions in Ethiopia; and also caters to the needs of the Ethiopian youth towards technology oriented skill development.	
15	Digital Transformation Trainings	Technobrain Ethiopia	Business Professionals, IT Professionals	Blockchain & Cryptocurrency, Machine Learning & AI with Python, Design Thinking, Mean Stack Development, Digital Marketing, Data Analytics, IOT, Robotic Process Automation, ChatBots, Cisco, Oracle	Workplace & Advanced		Techno Brain is the only organization that provides multiple learning methodologies, for you to benefit from. We have Instructor Led Training, Mentored learning, Online Live and Online Anytime. As part of Africa 1st Initiative, we endeavor to bridge the gap of employ-ability and provide day-one productive workforce to the industry. We offer a series of professional and academic programs that will equip graduates to acquire professional and academic skills respectively that are aligned to the market needs. Our matchless learning experience has touched the lives of 275,000 students leading to over 4,000 ICT placements out of which 12,000 have been provided with ICT scholarships by us. The ICT diploma programs, aligned to employ-ability needs of Africa, are supported by projects, job placements and internships.	https://www.technobraintraining.com/
16	AddisCoder	AddisCoder Inc.	High Schoolers	Programming with Python	Advanced		AddisCoder is a free intensive 4-week summer program in Addis Ababa, Ethiopia introducing high schoolers to programming and algorithms. The program ran previously in 2011, 2016, 2018, and 2019 and will run mid July — mid August 2020	www.addiscoder.com

5.1.2 Adama

S.N	Initiative	Lead Organization	Target Group	Trainings Offered	Digital Skills Level Addressed	Pricing Category	Background Description	Address
1	Various levels digital skills training COC skills gaps (bridging training) Diverse training packages as demanded	Nata Computer & Language Training Center	High school students Public servants Graduates Diverse business groups	Basic computer Peachtree IFRS COC Skills Gaps(level 1 to 4) Maintenance Adobe Photoshop Programing SPSS , STATA AutoCAD, SAP, ETABS, SAP, In-Road, Arch-Cad ,GIS, Water Cad, Eagle Point, Catia, Revit, Quantity Surveying, MS Projects and many more	Basic to Advanced	price largely remain negotiable for specific software packages the payment ranges from 2000 to 6000 ETB For basic 350 per month (including registration fee)	It is private owned small firms It is in operation for the last 5 years It has more than 60 computers in 3 rooms located in city center It allows flexibility and can easily mobilize professional trainers	09 31 60 22 57
2	Digital Literacy with MOSHE	Adama Science and Technology University	Public servants, local community	Five models based on Microsoft (basic level)	Basic	MOSHE sponsored	It is one of the public university with special mission dedicated to focus on science and technology research and education	
3	CISCO Training	Adama Science and Technology University	Students, teachers and others interested	CISCO packages	Advanced	Flexible payment system 500 ETB for students , 750 ETB for staffs , and 1000ETB for external target group		
4	ICT Training	Werabnet ICT Training Center	Anyone interested	Basic computer operation MS office Publisher COC Skills Gaps(level 1 to 4) focusing on IT and Accounting Maintenance (basic) Adobe Photoshop Peachtree (based on need)	Basic & Workplace	300 ETB per month for basic and others based on negotiation	It is small ICT training private center It has 20 computers and one room It is in operation for 3 years Located in Adama City center	02 21118669 / 09 10269025
5	ICT Training	Rohobot Computer Training Center	Students, graduates, interested public servants and others	Basic computer operating skills MS offices Adobe Photoshop Publishers Programing (C++ and Java based on demand) Peachtree	Basic & Workplace	300 ETB per month for basic and others based on negotiation	It is small private computer training center It is in operation for more than 5 years with limited growth	0911944923/ 0912194808 0912262480

S.N	Initiative	Lead Organization	Target Group	Trainings Offered	Digital Skills Level Addressed	Pricing Category	Background Description	Address
6	ICT Training	Hawas Computer Training Center	Students, public workers Fresh accounting graduates	Basic computer operating skills MS offices Computer maintenance Computer networking AutoCAD and Peachtree accounting	Basic & Workplace	350 for basic including registration Others ranging from 850 to 1700 based on demand	It is small private computer training center It is in operation for more than 5 years with limited growth	0913 434951 0967301058
7	Financial ICT Training	HARAZ Computer Training institute	Mainly accountants , public workers and graduates Students for basic computer	Basic computer IFRS Peachtree Networking CISCO pocket tracer	Basic & Workplace	Peachtree 500ETB Basic 350 And others 1700 ETB based on negotiation	It is small IT training center mainly foused on Accounting and IFRS It is in operation for 2 years One room training center with 20 computer and office	09 12232331

5.1.3 Bahir Dar

S.N	Initiative	Lead Organization	Target Group	Trainings Offered	Digital Skills Level Addressed	Pricing Category	Background Description	Address
1	Computing Science Faculty	Bahir Dar Institute of Technology	Qualified Students, Health Sector	Undergraduate: Software Engineering, Information System, Information Technology Computer Science; Post Graduate: Computer Science, Information Technology Trainings: Computer Networking (CCNA 1-4), DHIS2 (Health Management Information System), RedCap (Survey Management)	Basic to Advanced	Free, Trainings <3000 Birr	estled in the beautiful green town, Bahir Dar, just at shore of Lake Tana, the Faculty of Computing is one of the largest faculty in Bahir Dar Institute of Technology of Bahir Dar University. The Faculty offers undergraduate programs leading to B.Sc. degree in Software Engineering, Computer Science, Information Technology and Information System in the regular program with duration of 5, 4, 4 and 4 years respectively; and in continuing program too with duration of 5, 5, 5, and 5 years respectively. It also offers a 2 year M.Sc. degree in Computer Science, Information Technology will open soon M.Sc. degree in Software Engineering. Further, a 5 year summer program in Information Technology and Information System that lead to B.Sc. degree is the other program offered by the faculty.	09 12 17 30 62 bit.bdu.edu.et/
2	TVET	Bahir Dar Polytechnic College	Qualified Students	Basic Computer, Mobile Maintenance	Basic	1000-2,700 Birr	Bahirdar Polytechnic is a government owned TVET College	09 18 05 60 21
3	Computer Training	Abyssinia Computer Training Institute	Anyone Interested	Introduction to Computer, MS Package, Internet Usage, AutoCad, ArchiCad, ETABS, SAP, MX Road, Peachtree Accounting	Basic & Workplace	Price Ranges form 300 - 1,200 Birr per Training	Privately owned training institute in Bahir Dar	09 18 34 05 29
4	Computer Training	Y.COM Language & Computer Training Center	Anyone Interested	Basic Computer Skill, Maintenance, Programming (C++, Java), Peachtree Accounting, Graphics Designing, AutoCad, MS Project, ETABS, SAFE, ArchiCad, SAP, MX Road	Basic to Advanced	Price Ranges from 600 - 1,550 Birr Per Training	Privately owned training institute in Bahir Dar	09 18 01 18 78
5	Digital Training	Smart Computer & Engineering Software Training Center		MS Package, Programming (C++, Java), Peachtree Accounting, Adobe Photoshop, SQL Database, Internet Usage, Networking, Computer Maintenance, AutoCad, ArchiCad, SAP, ETABS, SAFE, MX Road, Eagle Point, MS- Project, Water Cad, Solid Work, MATLAB, SPSS, Ansys, SunSystem	Basic to Advanced	Ranging From 200-1800 ETB per course	Sole-Proprietership Training Center	09 18 43 78 03, 09 65 86 76 18, 09 75 16 32 59

5.1.4 Jimma

No	Initiative	Lead Organization	Target Group	Trainings Offered	Digital Skills Level Addressed	Pricing Category	Background Description	Contact Information
1	CISCO Instructor Academy	Jimma University	Instructors	IT essentials	Basic and Advanced	1,500		09 11800962
			Staff of the university	Introduction to Computer		1,500		
			the Community at large	Cyber Security		1,500		
			Studnets of the University	CCNA		3,000		
				Moble APP, Adroid		1,000		
				Big Data		1,000		
				Peachtree Accounting				
				CCNA scurity		1,500		
2	Basic Computer training	Abinet Infotech computer Training Center	Community	Introduction to Computer	Basic	600		09 11609488
				MS Windows				
				MS Word 2007/2010				
				MS Excel 2007/2010				
				MS Access 2007/2010				
				MS Publisher				
				MS Power Point				
3	Engineering Software Training	'	engineering gradauting students	AutoCAD	Advanced	500		
				SAP		500		
				ETABS		500		
				SAFE		500		
				ABAQUS		500		
				ANSYS		500		
3	Basic Computer Training	HiperTech computer training Center	Community	Introduction to Computer	Basic	750		09 17000142
				MS Windows				
				MS Word 2007/2010				
				MS Excel 2007/2010				
				MS Access 2007/2010				
				MS Publisher				
				MS Power Point				
				AutoCAD	Advanced	1,000		
				SAP				
				ETABS				
				SAFE				
				ABAQUS				
				ANSYS				
4	Basic Computer Training	MS Computer and Language Training Center	Community	Introduction to Computer	Basic	750		09 11831437
				MS Windows				
				MS Word 2007/2010				
				MS Excel 2007/2010				
				MS Access 2007/2010				
				MS Publisher				
				MS Power Point				
				Introduction to Internet				

RECOMMENDED COMPANIES FOR GIZ DIGITAL SKILLS PROVISION ENGAGEMENT

BASIC DIGITAL SKILLS

dot. DIGITAL OPPORTUNITY TRUST ETHIOPIA

https://ethiopia.dotrust.org

CPU COLLEGE ሲፒዩ ኮሌጅ

https://www.cpucollege.com

http://www.infonetcollege.edu.et/

WORKPLACE DIGITAL SKILLS

AMERICAN COLLEGE OF TECHNOLOGY

http://www.actamericancollege.com/

MicroLINK

http://microlink.edu.et/

Virtual Training

+2519 30 10 05 78/79

ADVANCED DIGITAL SKILLS

TECHNO BRAIN
Empowering Lives

https://technobraingroup.com/

GEBEYA
Best of African Talent

https://gebeya.training/

CRISP Centre for Research and Industrial Staff Performance
Addis Ababa, ETHIOPIA
India's premier Institute for Training, Consultancy & Software Development

http://crispethiopia.com/

5.2 Summary of Selected Digital Literacy Frameworks

According to UNESCO, Digital Literacy is described as a set of basic skills required for working with digital media, information processing and retrieval. Digital literacy frameworks developed by governments and concerned institutions help structure hierarchical provision of adequate digital literacy in educational institutions and help guide curriculums in schools, TVETS and higher education. Below, is an abridged summary of selected such frameworks.

A. British Columbia Digital Literacy Framework

The framework is developed by British Columbia Ministry of Education in Canada. It defines Digital Literacy as "the interest, attitude and ability of individuals to use digital technology and communication tools appropriately to access, manage, integrate, analyze and evaluate information, construct new knowledge, and create and communicate with others." The main components of the framework are,

- Research and information literacy
- Critical Thinking, Decision Making and Problem Solving
- Creativity and Innovation
- Digital Citizenship
- Communication and Collaboration
- Technology Operations and Concepts

The objective of the framework is 'preparing young Canadians to be digital citizens and to make good choices when using digital media' and it was developed for primary and secondary mainstream school students (Grade levels K-12). The Framework provides a clearer, more detailed sense of what digitally literate students should understand and be able to do at various levels of their development.

B. Costa Rica Student Performance Standards in Digital Technology-enhanced Learning

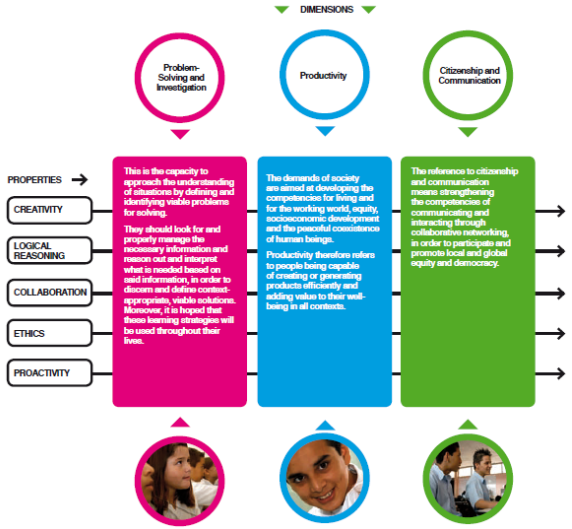
This framework co-developed by Ministry of Public Education in Costa Rica sets performance standards in digital technology-enhanced learning from pre-K to grade-level 12 (divided in 5 cycles including Pre-School). The document envisions to clearly define student digital technology capability at each educational level. 'The performance standard profiles are accompanied by a series of useful teaching guidelines for designing projects and learning opportunities, so that students can adopt digital technologies as tools for developing their capacities to reason, collaborate, participate, use knowledge for creating, define and solve problems and develop responsibly and safely in digital technology- mediated contexts.' The initiative encompasses three dimensions and five sub dimensions (properties) as follows:

Dimensions:

- Problem-solving and investigation
- Productivity
- Citizenship and Communication

Properties:

- Creativity
- Logical Reasoning
- Collaboration
- Ethics
- Proactivity

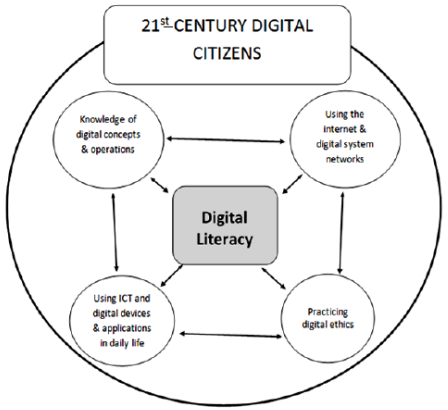


C. Philippines K to 12 Basic Education Curriculum for the Alternative Learning System (ALS-K to 12) Learning Strand 6

The government of Philippines – the owner of the framework – describes the overall goal of the curriculum frameworks as creating "21st-century digital citizens who are confident in using ICT and digital tools in a responsible and ethical manner."

The curriculum comprises 6 content standards and performance standards described briefly below:

1. (Content standard) Digital Concepts: (Performance standard) Explain basic concepts related to the use of information communication technologies (ICTs) in an increasingly digital world (12, sequenced learning competencies from simple to complex).
2. Digital Operations and Management: Demonstrate knowledge of basic hardware operations, software operations, and file management in using a computer (6 learning competencies).
3. Digital Applications: Use common office application software packages to produce documents and manage information as tools to solve problems in daily life (5 learning competencies for word processing, 7 for spreadsheet, 5 for presentation software).
4. Digital System Network: Navigate the digital global system to search for information and resources, and communicate with others in everyday life (6 learning competences).
5. Digital Devices: Make use of mobile devices as tools to access information and communicate with others (7 learning competences).
6. Digital Ethics: Demonstrate ethical practices and values in using technology in the 21st century (6 learning competences).



D. Microsoft Digital Literacy Standard Curriculum Version

The Digital Literacy curriculum includes the e-learning courses and the assessments. The courses include demonstrations, animations, simulations, hands-on labs, and games into a rich learning environment that allows the learner to thoroughly explore each topic. Used by many nations including Oman, Fiji, Morocco, Rwanda, South Africa and Thailand - the initiative is an ongoing enterprise framework from a for-profit business in partnership with national institutions. The components of the framework encompasses:

Computer Basics
"The content introduces students to the fundamentals of computing, explains the components of a computer, explores operating system basics, and demonstrates how to use a mouse and a keyboard. Completing the Computer Basics course, or already having a similar level of skill, is a prerequisite for taking the other courses in the curriculum. The other courses may be presented in any order, after the students complete the Computer Basics course."

The Internet and World Wide Web
"This course shows students how to connect to the Internet; browse Web sites; use search engines; exchange e-mail and instant messages with others; explore the features of online communities; and it explains how Web authoring software is used to create and publish Web pages."

Productivity Programs
"This course explores the most common productivity software applications used in business, in education, and at home. Students are taught to select the right software for a project, and how to perform basic tasks by using word processing, spreadsheets, presentation software, and database software."

Computer Security and Privacy
"This course introduces key concepts in computer security and in the ethical use of the technology. It explains the risks and threats to computer security and privacy, and outlines the steps every user should know to prevent information theft."

Digital Lifestyles
"This course introduces the students to new digital technologies, including digital audio, digital video, and digital photography. It explores how these and other computing technologies are creating new career opportunities and shaping the world in which we live."

E. DigComp 2.0: The Digital Competence Framework for Citizens

The Digital Competence Framework for Citizens, also known as DigComp, was first published in 2013 by the European Commission. It is a tool to improve citizens' digital competence, help policy-makers formulate policies that support digital competence building, and plan education and training initiatives to improve the digital competence of specific target groups. DigComp also provides a common language on how to identify and describe the key areas of digital competence and thus offers a common reference at European level.

The competences that are addressed on this framework are discussed on the table across:

Competence area	Competences
1. Information and data literacy	1.1 Browsing, searching and filtering data, information and digital content 1.2 Evaluating data, information and digital content 1.3 Managing data, information and digital content
2. Communication and collaboration	2.1 Interacting through digital technologies 2.2 Sharing through digital technologies 2.3 Engaging in citizenship through digital technologies 2.4 Collaborating through digital technologies 2.5 Netiquette 2.6 Managing digital identity
3. Digital content creation	3.1 Developing digital content 3.2 Integrating and re-elaborating digital content 3.3 Copyright and licenses 3.4 Programming
4. Safety	4.1 Protecting devices 4.2 Protecting personal data and privacy 4.3 Protecting health and well-being 4.4 Protecting the environment
5. Problem solving	5.1 Solving technical problems 5.2 Identifying needs and technological responses 5.3 Creatively using digital technologies 5.4 Identifying digital competence gaps

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