



STIKK

KOSOVO ASSOCIATION OF INFORMATION
AND COMMUNICATION TECHNOLOGY

ICT SKILLS GAP ANALYSIS

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The views expressed in this report are those of the survey respondents and authors, therefore they do not necessarily represent the views of STIKK.

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ABBREVIATIONS

ICT - Information and Communicartions Technology

STIKK - Kosovo Association of Information and Communication Technology

EYE - Enhancing Youth Employment

VET - Vocational Education and Training

KIPRED - Kosovar Institute for Policy Research and Development

1. INTRODUCTION

The ICT Skills-Gap report is the second of the two reports coming out of the research project commissioned to STIKK by the EYE¹. The report aims to provide an update regarding the ICT workforce in Kosovo, including the perceived gap between the skill supply and the demand, with a focus on the obstacles and the reasons contributing to this gap, and the implications on the growth of the sector.

Since its incorporation in 2006 STIKK has been at the forefront of the developments in the sector by implementing some of the most innovative projects in the ICT sector in Kosovo, such as organizing trainings that were not available earlier in Kosovo, fostering business linkages and organizing events in the interest of our members and society at large (“Job fairs”, “ICT fair”, participation to international fairs, etc). STIKK has been involved in the working groups and has enabled the voice of the ICT sector heard in public debates concerning policy changes affecting ICT sector. STIKK has conducted continuous research to increase and validate its own understanding of the sector, the current needs and the potential for growth. This report continues on such prior STIKK research, namely the studies of the “ICT in Kosovo – A sector Decoded” and “ICT Skills-Gap in Kosovo” conducted during 2010 and 2011 respectively.

This research is a combination of efforts invested by STIKK, who provided the type of institutional memory needed for such research as well as its pool of resident ICT experts; of EYE, who provided its expert and management capacities; of the contracted research company Index Kosova, who executed all the research and provided the raw data; and lastly, of each and every respondent who participated in the research. All errors and omissions in this report remain, nevertheless, the sole responsibility of the authors.

1 “Enhancing Youth Employment” -EYE project, is financed by Swiss Cooperation Office SDC and implemented by Helvetas Swiss Intercooperation HSI and Management Development Associates MDA” www.eye-kosovo.org

2. SUMMARY

The ICT Skills-Gap Analysis continues on the previous STIKK study of 2011, by providing a comparative analysis from the already established baseline, and by expanding to include the assessment of the needs of the non-ICT sectors for a qualified ICT workforce.

The situation in the ICT sector in Kosovo has not changed significantly in the period of 2011 - 2013. The government has had dominant influence on the ICT sector in Kosovo, more so by the virtue of it being the biggest customer in the country thus affecting the demand for ICT, and secondly by enacting and imposing policies affecting the overall business environment, specifically, regulations affecting the ICT sector. At present, however, the government is not any longer the biggest ICT customer in Kosovo having been surpassed by telecoms and financial sector. But on its role as a policymaker nothing has changed vis-à-vis ICT sector: government continues to postpone enactment of policies that would ensure business environment favorable to ICT growth, and it also did not enact any new education policies that would enable adequate supply of ICT workforce.

Rather than on the content of past and actual government policies for the ICT sector, this study focuses on the effects of such policies on ICT sector and on the workforce as viewed by the ICT companies. It was also of interest to examine whether the process of policy development has changed since the STIKK's last study of 2011; whether the ICT sector in Kosovo is being consulted by the government while adopting the policies affecting ICT sector and ICT education, whether the educational institutions consult the ICT sector to determine the needs when developing ICT curricula, and for the first time in a study of this nature, whether anyone at all consults the fresh supply of students and ICT professionals on ...well ...anything.

The net effect is that ICT companies are kept unhappy with the fresh supply of employees they are getting from the educational system, and that companies keep paying the cost of employee training which is necessary to bring them to the point of making them useable to the company. It is not clear however, for how long they will be able to do so, given that the ICT companies are indicating clearly that they are struggling for the lack of work and that general economic turmoil is affecting them more harshly than ever.

The ICT students and young professionals - a building block overlooked by most existing market research - were included in this study with a very simple aim: to understand what is it that drives them to pursue careers in ICT? The study revealed an interesting and somewhat contradictory picture. The typical employees in the ICT sector in Kosovo are well educated: bachelor degrees seem to be the norm while about a third has a masters or higher degree. Employees coming from public universities outnumber those from private ones at 3 to 1. All ICT students pursue programs with most technical skills on offer, and give very little weight to soft skills, if at all. They know that the choice of study programs they are offered is mostly out of date, that they are not getting enough practice, and that the job market will be requiring more than what they are getting through education. Vendor trainings, though not exactly clear which ones, and who will pay for it, will help them land or keep a job in the ICT industry. But students have little or no information on what jobs exactly are out there and which skills are most required for these jobs. Anyhow, getting a higher education degree, "something everyone should be equipped with", seems to have earned a status of universal social expectation, rather than originating as a requirement out from the job market. Understanding all this information

and putting it in perspective was not straightforward, and we would be glad if the results presented here provide grounds for further research designed solely for these ICT students.

The educational system has been very active in marketing its ever raising ability to pump up new students and embrace new programs, although almost always focusing on the inputs: facilities, labs, faculty, programs, alignment with some foreign university and similar, and not on the outcomes such may be the success of their students on the job market. Tracking systematic data on the career development of former students has not yet become the norm in Kosovo, especially not within the public educational system. In addition, the process of curriculum development at both, public and private educational institutions has missed to consult in any way the vast majority of ICT and non-ICT firms. The situation stands similar to the research of 2011, and also similar to the issue of inclusion of the businesses in the policy making process with regard to workforce preparation for the ICT sector, which is still not happening.

An attempt to differentiate the best and worst educational programs and institutions did not bring any breakthroughs as, basically, all educational programs and institutions appear to be all too similar. The fact that the number of employees coming from public university is threefold that of private universities, can only be attributed to reasons such as its life-span going back decades, lower tuition fees, general reminiscent cultural bias towards “public” in a society transitioning from socialist mindset, past glory of the university or some combination thereof. The best employees come from University of Prishtina, who provides ICT businesses with graduates who are “well prepared, capable and successful”. However, to paraphrase in the words of one of the teachers at this university, it may happen that students that enroll there are excellent to begin with, and that the university can not get the best of them by the time they graduate. Yet another dichotomy worth researching further.

3. METHODOLOGY

The research methodology of this project consists of combined qualitative and quantitative research methods. In a chronological manner, the project started with desk research, and continued with individual in-depth interviews, quantitative/field research and focus group discussion.

1. The project started with desk research consisting of literature review of the existing publications on the Kosovo ICT sector and, specifically, on the skills and education issues related to this sector. The review concentrated on identifying any new publications and major developments affecting the Kosovo ICT Sector since the time the baseline situation was recorded by STIKK in the research 2011, “ICT Skills-Gap in Kosovo”. To achieve this, a list of available publications on the subject matter was prepared by STIKK and the documents were reviewed independently by the contracted research company.
2. The project then continued with in-depth interviews with limited sample of respondents coming from few companies’ from both, ICT and non-ICT sectors. The individual in-depth interviews (typically 35 minutes long) were conducted with key informants from ICT companies and educational and training institutions. There were 27 in-depth interviews in total, 10 interviews with ICT companies and 17 interviews with educational institutions. The fieldwork took place during August 15 - September 30, 2013.

The in-depth interviews provided the means to verify the initial findings from the desk research and it assisted greatly with the finalization of the quantitative research questionnaires. Since the intent was to provide comparison and thus keep the same questionnaires as the ones used for the researches conducted by STIKK in 2010 and 2011, it was necessary to verify that the questions still remained relevant to 2013, and afterwards modify some questions and formulate new ones as appropriate. In particular, it was essential to test if the same questions were relevant to non-ICT sector which was being included in this current research, and to generalize questions where necessary as to benefit all intended respondents, ICT and non-ICT alike. At the end of this phase, a combined questionnaire was finalized, which comprised of two parts, basically two independent questionnaires, one on ICT Market Analysis and one on Skills Gap Analysis that were both used, with minor differences, over the ICT and non-ICT sample.

3. The field research, initially planned for August 2013, had to be postponed upon suggestion from few early respondents and due to the prevailing unavailability of respondents during the summer holidays. The field research was finally completed during September 2013. It included 65 companies from the ICT sector and 448 companies from other sectors, such as: retail sales (47.5%), manufacturing and mining (13.7%), services and tourism (12.6%), construction (10.6%), healthcare (3.3%), transportation (2.9%), as well as few other sectors.

4. The final part of this research included focus group discussion comprised of a group of students, interns and fresh ICT employees. While all available research focused almost exclusively on ICT companies, on educational institutions or on government policymakers, we felt that including the personal perspective of the current and potential employees in the ICT sector in the discussion may contribute in adding another dimension to the understanding of the skills-gap problem in the ICT sector. The focus group discussion, lasting about 90 minutes, included 8 participants in total. The focus group discussion took place in October 2013.

In the end, it presented considerable efforts to aggregate, analyze and summarize the sheer amount of raw data provided by the contracted research company, and adding to it all the comments, notes and input by stakeholders which accumulated throughout the duration of the project. The draft reports were reviewed by EYE and STIKK and were augmented as appropriate.

4. SKILLS-GAP ANALYSIS

4.1 SECTOR OVERVIEW

This section brings a general idea of the profile of ICT Sector in Kosovo in order to understand where the demands for specific skills originates. This section is an outline of the detailed findings from the ICT Market Analysis report, which was the first one coming out of this combined research project.

The ICT sector in Kosovo comprises of small companies with 14.3 employees on average (down from 15.4 employees on average a year ago), with a distribution on annual turnover in the ranges of 5,000 to 50,000 (11%), 50,000 to 250,000 Euros (5%), 250,000 – 1M (6%) and with 15% having turnover of more than 1million Euros annually.²

Compared to the survey of 2010³, the types of most prevalent activities that IT companies in Kosovo engage are: Maintenance and repair at 29% (up from 17.6% in 2010), Software development 28% (up from 13.2%), Internet Service Providing 25% (up from 7.7%), Training/Certification and Consulting at 17% each (up from 5.5% and 7.7% respectively), Network & Systems operation/management 12%, Information Services 6%, Manufacturing/Assembling and Retail Sales at 5% each (retail sales down from 18.7%).

The ICT sector of Kosovo has a handful number of consumers at present. These consist of the telecommunications, financial sector, government, individual buyers /home users. ICT penetration into other private sectors in Kosovo is largely untapped and presents an opportunity for growth identified by most ICT businesses.

In comparison to the average sample of non-ICT businesses incorporated in this research, the ICT sector provides more potential over many indicators including here the tendency towards innovation and new products development, ownership structure better positioned to absorb foreign investment, better gender balance and younger employees at managerial levels, higher involvement in future employee education and internships, much higher sector organization and self-regulation, and systematic involvement in advocacy for policy changes affecting the sector.

TARGET INDUSTRIES

The main industry currently targeted by most ICT companies in Kosovo is Telecommunications (66%), followed by Government, Police and Emergency Services (46%) and Financial sector (45%). Other targeted industries are: Retail, wholesale (34%), Professional, scientific and technical services (34%), Education and training (29%), Energy (25%), Insurance (22%), Transport and postal (17%), Construction (15%), Water and waste (15%), Healthcare and social services (12%), Accommodation and food (11%).

INVESTMENT AND GROWTH OPPORTUNITIES

Opportunities for growth are seen mostly locally. Areas expected to grow are: Internet Service Providing (32%), Software development /programming (25%), maintenance and repair (23%), vendor sales (19%), Engineering services (19%), Training/certification (17%), Information services (12%), Web development (12%), Retail sales (3%). Business Process Outsourcing (BPO) is explicitly seen as an area of growth by only 5% of companies. Mobile application development and Online banking and

2 IT has to be noted that very high proportion of companies (63%) during this research did not feel comfortable declaring annual turnover data and did not disclose such data.
3 Shaipi, K.: ICT in Kosovo – A sector decoded. STIKK, 2010.
http://www.stikk-ks.org/uploads/downloads/Demand_Supply_Survey_IQ_Consulting_02.pdf

e-Commerce services appear as the least likely areas of growth, mentioned by only 2% of companies. Although few in numbers, these companies specialize and operate almost exclusively in BPO, mobile application or e-commerce services. On the other side, the IDC study of 2012 notes that IT services, although not having the biggest growth rate in 2012, are the second biggest segment by value, coming right after the networking equipment segment.

When asked the same question, 'how to grow?', ICT and non-ICT companies reveal subtle innate differences: ICT companies, more so than non-ICT companies, give more importance to adding new products and services, to expanding sales network, and especially to increasing ICT use within the company, increasing online sales and automation of production and work processes.

ICT INDUSTRY POTENTIAL FOR GROWTH IN OTHER LOCAL SECTORS

The actual ICT penetration in other sectors is relatively low, and it provides indication on the growth potential in these sectors. Sectors such as healthcare, transportation, agriculture, education, science-culture-art, and army-police-security are currently extremely underserved by the ICT sector. This may come, among others, from reasons such as lack of communication and lack of information on the existing needs for ICT in these sectors, lack of information among these sectors that there exist out there ICT solutions appropriate for use in these sectors, and from lack of experience on the part of Kosovo ICT companies to market their services to these sectors.

The rest of this section replicates several interesting outcomes of the Market Analysis report that came out of the questions regarding the number of employees, salaries, expected number of new hires in the next year, interest to hire interns, staff turnover and reasons for it, the time needed to fill-in open positions and the ways they find new employees.

4.2 CURRENT EMPLOYEE STRUCTURE IN THE ICT SECTOR

The average number of employees for the 65 surveyed ICT companies is 14.3, down from 15.4 a year ago. Extrapolating for the estimated total of 120 companies operating in the sector, it gives the estimated number of 1716 total employees in the ICT sector. These include full- and part-time employees as well as interns. The employee gender structure in ICT sector is 80% male and 20% female, which is the same proportion as in the non-ICT sector. At managerial levels, ICT companies have more balanced gender structure though not by much: 80/20 ICT vs. 92/8 non-ICT, male/female.

The surveyed ICT companies expect to hire a total of 79 new employees in the next year which, extrapolated for the estimated total of 120 companies operating in the sector, gives the estimated 146 total new job openings planned for the next year⁴. Around 58% of the surveyed ICT companies plan to hire interns too. Following similar calculation as for the job openings, it gives the number of 238 new interns needed in the next year.

ICT companies have slightly lower staff turnover (1.3) than non-ICT sector (1.9), and they lose staff mostly to other sectors for better payment in these other sectors. It takes the ICT sector longer time to fill-in the open vacancies and it does so more by means of open public announcements.

The best paid employees are Database developers, with an average net salary of €571, followed by

4 The number of new job openings is calculated based on number of surveys conducted.

Managers (€532), Web developers (€488), Software developers (€444), Project managers (€435), and Network Engineers (€441).

Employee stats	ICT	Non-ICT
	mean	mean
Total number of employees	14.3	21.8
Full-time employees	12.5	19.3
Part-time employees	0.8	1.7
Interns	0.9	0.8
Male	11.4	17.4
Female	2.9	4.4
Total number of employees a year ago	15.4	20.7
Number of employees hired during the year	1.5	2.6
Number of employees planned on hiring next year	1.2	2.5
Number of interns planned on hiring next year	2.0	1.0
Number of employees that have left the job	1.3	1.9

Employee structure and salaries	No of employees	Average salary
	mean	mean
Manager	1.4	532
Project Manager	1.6	435
Office administrator	1.0	397
Human Resources	1.1	372
Finances	1.2	375
Logistics	1.5	250
Sales and Marketing	1.9	333
System Administrator	1.8	364
Network Engineer	1.6	441
IT Support	2.5	368
Database Developer	2.1	571
Web Developer	1.9	488
Software Developer	2.8	444
Other	3.3	350

IT staff in non-ICT firms

Only 20% of non-ICT firms have declared that they have IT staff on their employee lists, whereas the rest contract someone outside of their company.

NEW HIRES IN A YEAR

Little over one third of the ICT companies (35%) plan to hire new employees in the next year, 25% don't, while 40% are unsure, which is a higher degree of uncertainty than with the non-ICT companies. As stated, the total number of new ICT positions planned for the next year is 79.

Does your company plan on hiring new employees in the next year?	ICT	non-ICT
Yes	35	38
No	25	32
Don't know	40	30

Employees planned to be hired in positions:	N (sum)
Manager	0
Project Manager	1
Office administrator	0
Human Resources	3
Finances	2
Logistics	1
Sales and Marketing	13
System Administrator	0
Network Engineer	2
IT Support	2
Database Developer	1
Web Developer	2
Software Developer	13
Other	39
Total new positions planned in the next year:	79

DIFFICULTIES IN FILLING IN THE VACANCIES

As stated, ICT companies in average have slightly lower staff turnover (1.3) than non-ICT sector (1.9). The top three reasons why they lose staff are: better offer in other sectors (19%), followed by “fired” (13%), and then somewhat the contradictory “going back to studies” (6%).

The companies in the ICT sector find it harder to fill-in job positions, it takes them longer to do so, and once they do, they invest more on employee training. Thus, it can be assumed that they have an interest to keep their staff longer, though not at any cost: 13% of staff that “leaves” ICT companies does so by getting fired, as opposed to 8% in non-ICT companies.

On the employee side, at first, we were curious to understand why would (6% of) employees quit jobs to go back to studying, knowing well that educational system does not exactly provide them with the skills demanded by the companies, just to start looking for jobs all over again once they complete the studies, all this in a country with over 45% unemployment level! To understand this behavior we considered several factors of which the following two seem more credible. First, the inability of employees to continue studies in parallel with work, which doesn’t comes much as a result of workload

as it comes from the inflexibility of the educational system which runs during the same work-hours and, in addition, is “all-or-nothing”, meaning, one may not enroll just in the courses of interest, but must take the whole study program as offered, sequentially, semester by semester. The second factor that explains this behavior is the generally high value bestowed on degrees and diplomas in the social context of Kosovo, a detail which surfaced during the in-depth interviews with companies as well as during the focus group discussion with students, young professionals and employees.

Going after better offers in other sectors is easier to understand, for example, considering the size and strength of the financial sector which can easily afford higher payments to ICT professionals, but nevertheless, it is worrisome that so many professionals leave the ICT sector after they have been trained and gotten experience there. In average, ICT companies take longer time than non-ICT companies to fill-in the vacancies, which increases progressively with the level of qualifications required. The ICT companies use public advertisements to get new people much more than non-ICT companies, thus going beyond the circle of personal acquaintances and the family members which, in the setting where most businesses are (one) individual-owned businesses, is otherwise the first practice they would resort to. Most companies resort to more than just one way of finding new employees.

Time needed to fill in available positions?	ICT %	non-ICT %
Less than a week	14	25
1-2 weeks	14	23
3-4 weeks	17	12
1-2 months	9	6
More than 2 months	9	4
Don't know	37	31

How do you find new employees?	ICT %	non-ICT %
Public advertisements	60	39
Practice programs with educational and training providers and institutions	3	1
Outsource head-hunting	2	2
Personal contacts and references	45	76
Initiative on the employee side	-	1
Other, don't know	2	4

TRAINING OF EMPLOYEES

Absolute majority of ICT firms (83%) train their employees within their company and only 3% train them outside their firms. Only 11% don't train their employees at all. On the other hand, less than half (48%) of non-ICT firms train their employees within their company and 12% train them outside their firms, while 37% do not train their employees at all.

Where do you train your employees?	ICT	non-ICT
In-house, e.g. mentoring, orientation, professional training centers	83	48
Outside of the company, in training centers etc.	4	12
Don't train them	11	37
Other, don't know	3	3

Cost of training

ICT companies invest around €600 on average per year for training of their employees, whereas non-ICT companies invest a little more, €1,000 per year on average, but for fewer percentage of employees.

Specific trainings provided to employees

Training on computer networks (cumulative: *Computer networks training and Cisco*) is the most frequent training (22%) the ICT companies send their employees to. Non-ICT companies, on the other hand, send their IT staff to be trained on Hardware repair and maintenance most (23%).

What kind of trainings have you offered / do offer to your employees? (cumulative percent of three mentions)	ICT	Non- ICT
	%	%
Internal Training/How to use equipment	17	55
Computer networks training	11	2
Web Design	6	-
Training in different workshops	6	2
Training for Microsoft Office	6	-
Hardware repair and maintenance	11	23
Basic trainings	6	4
Customer Care	6	6
Sales and Marketing trainings	11	4
Training for Accounting Software	11	9

IT trainings (other IT training)	17	-
Database training	11	-
Cisco	11	-
GIS	11	2
Arc-GIS	6	-
Auto-CAD	6	-
Professional trainings	-	9
Graphic Design	-	4
Management trainings	-	6
Cultural heritage	-	2
Tutorial	-	2
Other	-	13

Duration of training for new employees

For the majority of firms, ICT (68%) and non-ICT (56%), it takes 1-3 months to train new employees.

How long do you train new employees?	ICT %	non-ICT %
1-3 months	68	56
4-6 months	23	21
7-9 months	2	-
Longer than 9 months	5	12
Other, don't know	2	11

SKILLS DEMAND

Required skills

During the in-depth interviews, the ICT sector representatives enlisted a number of skills which they deem as most important and required skills for their workforce:

- **Formal education, academic and professional qualifications** - is taken for granted, “everyone” should have this.
- **Trainings and certifications** – the vendor based ones, are always welcome by the ICT sector, as they are considered up to date and more trustworthy.

- **Experience and practice** – have been repeatedly given high importance when hiring new employees. But, as this can not be expected to be present by first-time employees, the sector feels these should be included in the curricula.
- **Language and communication skills** – are required when working with clients, for general reporting and project documentation.
- **Team work** – ensures more efficient problem solving.
- **Soft skills** – primarily time management and task management.
- **Ambition, self-confidence, strong will** – are self motivating and ensure better productivity.
- **Patience and dedication** – when working on problems requiring creative solutions, such is software development, systems design etc.
- **Analytical skills**
- **Work ethics and culture**

This got echoed also via the questionnaire, where all these skills were considered as very important without major difference between any particular categories of skills. Interestingly enough, non-ICT companies also considered these skills at the level of importance almost equal to that of the ICT companies.

According to the skills that your employees should have, how important are these?



Specific technical skills needed most by ICT firms

The most needed technical skills by ICT firms are: Advanced Networks – CCNP (37%), Server-Client Programming - Java and C++ (32%), Database Administration - MS SQL, Oracle, MySQL (31%), System Administration - MS Windows Server, Exchange Server (28%) and Web Programming - PHP, ASP, Perl, Python (22%) and Web design and Photo editing (17%).

In terms of management skills, the most needed skills by ICT companies are: Sales management (45%), Project management (35%), Marketing management (29%), and Contract management (22%).

Which of these technical skills does your company need most? (cumulative percent of three mentions)	ICT
	%
Advanced Networks (CCNP)	37
Server-Client Programming (Java, C++)	32
Database Administration (MS SQL, Oracle, MySQL)	31
System Administration (MS Windows Server, Exchange Server)	28
Web Programming (PHP, ASP, Perl, Python)	22
Web Design (Html, JavaScript, photo editing skills)	17
Basic technical skills (ECDL, Cisco IT Essentials 1)	8
Administrators of Linux Systems	8
Basic Network Computing (CCNA)	6

Which of these management skills does your company need most? (cumulative percent of three mentions)	ICT
	%
Sales management	45
Project management	35
Marketing management	29
Contract management	22
Business analyst	20
Financial management	3
Human resources management	3

Missing skills among IT employees in the ICT companies

The list of missing skills by the employees joining the ICT sector echoes the list of the required skills. During the in-depth interviews with the ICT sector companies, the following skills came out as missing ones:

- **Soft skills** – as in not able to plan and manage themselves in a workplace, not able to articulate to others what they want or need.
- **Communication skills** – ability to communicate and introduce to others the work they are performing.
- **Code of ethics** – knowledge of basic principles and rules when at work.

- **Language skills** – employees should have better language skills and know more languages.
- **Technical professional skills** – such as: software development, system integration, mobile development, and specific platforms: .net, java, html5, cml, and css.
- **Dedication and responsibility** – seems that employees do not come well prepared for the work culture expected in a workplace, including dedication and responsibility.
- **Practice and experience** - private companies would rather not waste time and money providing an arena for practice and experience to their new employees, especially considering the amount of investment the same employees were ready to spend on themselves getting, alas, not quite adequate education.
- **Self-confidence** - there is no self-confidence and initiative.
- **Ambition and interests** – appear not so much interested and enthusiastic to develop, grab opportunities, take initiative.
- **Presentation skills** - are generally completely absent with new employees.
- **Writing official letters** - basic training needs to be provided to new employees.

Using questionnaire, it was possible to discern the skills that new employees are missing most. These were: Professional trainings and certifications (39%), Knowledge on how to use the equipment (37%) and Language skills (37%). Other skills that are also missing, but are of less importance, are: Knowledge of operational procedures at work (26%), Management skills (22%) and Communication skills (20%), Skills to train others (17%), and Problem-solving skills (12%).

Comparing managerial skills and technical skills, ICT companies consider that technical skills of their employees are just a little more important (54%) than managerial skills (45%).

What are the skills that new employees lack mostly? (cumulative percent of three mentions)	ICT
	%
Professional trainings and certifications	39
Knowledge on how to use the equipment	37
Language skills	37
Knowledge of operational procedures at work	26
Management skills	22
Communication skills	20
Skills to train other workers	17
Problem-solving skills	12

Missing skills among IT employees in non-ICT firms

The main missing skill identified by non-ICT firms is Work experience in similar position (41%), followed by Training and Certifications (22%), Knowledge in the use of equipment (22%) and Time management skills (22%).

What are the skills that new ICT employees lack mostly? (cumulative percent of three mentions)	Non- ICT
	%
Work experience in similar position	41
Training and Certifications	22
Knowledge in the use of equipment	22
Time management skills	22
Language skills	14
Management skills	14
Communication Skills	10
Knowledge of work operational procedures	10
Inter-personal skills	9
Skills to train other workers	8
Formal education	5
Problem-solving skills	5
Other	1

4.3 SKILLS SUPPLY

WHERE DO THE EMPLOYEES COME FROM?

The future ICT professionals of Kosovo have practically only two options when it comes to the institutions they can get an ICT education from. These are:

- National universities, both, private and public.
- Private VET centers such are vendor training centers, independent training centers, in-company training centers.⁵

There is also a third group of potential public VET centers established by the government in almost every bigger city in Kosovo, but these do not offer much in terms of ICT education, or at least not much of what is required by the ICT companies. Throughout the interviews with ICT companies, there was no mentioning of one case where an employee might have come from these centers, was sent there for training or is planned to be sent there. In fact, most companies are oblivious of the existence of such government-run VET centers. There seems to have been no progress in this regard since STIKK conducted ICT Skills Gap Analysis in 2011 when this was last brought to attention⁶. Consequently, these centers were excluded from discussion of present or potential supply sources of ICT professionals.

5 ESI Center: Analysis of ICT Industry in Kosovo - Economic Region Center. ESI, 2011.

6 Nikaj, B. and Lila, A.: ICT Skills Gap Analysis. STIKK, 2011. http://www.stikk-ks.org/uploads/downloads/Skills_Gap_Analysis_for_Information_and_Communication_Technology_02.pdf "active labor market policies (i.e., internship programs, on-the-job training interventions) have yielded disappointing results. In fact, less than 2% of the unemployed target population has benefitted from such state-organized capacity-building measures" - referring to a report from Luxembourg Agency for Development Cooperation, 2006, quoted on Gemici, S. & McFaden, K., (2009): Contributions of Private-sector ICT Workforce Training to Post-conflict Reconstruction: A Case Study from Kosovo, (p8)

The primary and secondary schools offer only rudimentary ICT education, such as basic courses on informatics and courses on the use of office applications (usually MS suite) and, same as with the public VET centers, are not considered as a credible supply of ICT professionals by the industry.

Public or private?

Majority of IT employees, both: in ICT and non-ICT companies, comes from public, higher education (HE) institutions. ICT companies have a little higher percentage (73%) of staff coming from public institutions than non-ICT companies (62%).

Where did your employees get their education from?	ICT	Non-ICT
	%	%
Public HE Institutions of Education	73	62
Private HE Institutions of Education	27	38

Both ICT and non-ICT companies are relatively satisfied with the educational institutions – though slightly more satisfied with public institutions. On a scale from 1 to 10, ICT companies are satisfied with the employees coming from public educational institutions at 7.9 while it is 6.9 for private educational institutions. For non-ICT companies these numbers stand at 8.2 and 7.7 respectively.

Best educational institutions for ICT qualifications

Most ICT firms declare that their best employees come from FIEK (26%), from the University of Prishtina (UP) in general (17%), and from the Faculty of Economics of UP (12%).

Interestingly, the majority of non-ICT companies (83%) don't know which institution supplies them with best employees, which may be interpreted twofold: that these companies do not have sufficient number of ICT employees to compare from or, perhaps, that they lack concern since the quality of education of their ICT employees may not have much influence to these companies.

From which institutions of education do your best ICT employees come from?	ICT	Non-ICT
	%	%
Faculty of Electrical and Computer Engineering - FIEK	26	3.1
Prishtina University	17	3.3
Faculty of Economics - UP	12	0.9
AUK	9	0.9
UBT	8	1.1
FMNS - Computer Sciences	6	0.9
AAB	5	1.1
Faculty of Civil Engineering	3	-
Faculty of Business - Pejë	2	-
Economic School - Ferizaj	2	-
Iliria	2	0.2
Other	-	5.1
Don't know	8	83.4

The quality of educational institutions for ICT qualifications

Asked to distinguish one educational institution they are most satisfied with in this regard, most ICT companies named University of Prishtina. When asked why they are satisfied most with the employees coming-in from the University of Prishtina, 84% of the ICT firms stated that students from UP are well prepared, capable and successful, and 7% stated that the students from there come out with more practice /experience.

When it came to naming the worst institution, majority of ICT and non-ICT firms do not distinguish an educational institution which provided them with employees they are least satisfied with. This, however, mattered more to ICT firms, who did care to mention an institution or two with which they are not satisfied with.

From which educational institutions do your employees come from that you're least satisfied with?	ICT	Non-ICT
	%	%
University of Prishtina	5	0.2
Faculty of Economics - UP	3	0.2
Iliria	3	-
AAB	3	0.2
FSHMN - Computer Sciences	3	-
Faculty of Law	2	-
FSHMN - Geography Department	2	-
Faculty of Electrical and Computer Engineering - FIEK	-	0.2
Fama	-	0.2
Don't know	79	99

WHAT SKILLS DO THE STUDENTS THINK MATTER THE MOST?

The focus group discussion with young ICT students and professionals reveal one minor but important difference between them and the businesses over the understanding of the skills required to work on ICT sector in Kosovo. Namely, young people rationalize that the technical skills are, basically, all there is, compared to the businesses which put an equal, and on occasions more emphasis on social skills. Hence, almost universally, ICT students and young professionals are focused on technical skills and have a notable deficit of soft skills, project and business management skills.

Although it appears that young ICT students are able to pick up some work experience and internships significantly earlier than students pursuing other careers, such may be, say, the case with students of economics or law schools, this experience is still much lower than the expectations and requirements put up-front of them by their future employees in the ICT sector.

Common to most every student group in Kosovo, the ICT students in the higher education system lack information on the jobs available once they graduate, either number of jobs, specific qualifications required, etc. Getting a higher education degree, "something everyone should be equipped with", seems to have earned a status of universal social expectation, rather than originating as a necessity of the job market. Because ICT students and young professionals are very well aware that specific technical trainings, more so than formal education, are most beneficial to landing or keeping a job in the ICT sector. And they are also well aware that the knowledge they are getting through the educational system is not sufficient to be successful on the job, that what they are getting is frequently out of date and mostly theory lessons with very little practice.

UNIVERSITY LEVEL ICT EDUCATION PROVIDERS

Compared to previous years when University of Prishtina stood practically alone, nowadays more and more universities offer majors in fields such as computer sciences, information technology and electrical engineering.⁷

ICT education programs at the higher education level are currently offered by:

- University of Prishtina, at Faculty of Electrical and Computer Engineering, Faculty of Mathematical and Natural Sciences and at Faculty of Economics (Information Management).
- University for Business and Technology (American European University – Kosovo), at Faculty of Computer Science and Engineering.
- Univerzum University, offers bachelors programs in Computer Science
- Iliria University – Prishtina, offers bachelor programs in Management and Informatics and Computer Sciences.
- University of Prizren, has its Faculty of Computer Sciences.
- American University in Kosovo, offers non-degree ICT trainings by its AUK Training and Development Institute, mostly vendor based: Cisco Systems and Microsoft trainings.

STIKK has been able to obtain only partial data on the number of students registered in higher education institutions, while data on the number of graduates is not available at all. It is believed however, that percentage of students that graduate is only 10% of that that register.⁸

Number of registered students in educational institutions	2008	2009	2010	2011	2012
UP, FMNS - Computer Sciences, BA	150	150	195	100	60
UP, FIEK - Computer engineering, BA	-	-	200	100	60
UP, FIEK – Telecommunications, BA	-	-	200	100	60
UBT – Computer Sciences and Engineering, BA	129	99	234	344	546
UBT – Computer Sciences and Engineering, MA	-	9	21	90	126
UBT – Mechatronics Management, BA	-	21	13	21	54
UBT – Mechatronics Management, MA	-	-	8	7	16
UBT – Information Systems, BA	-	-	4	15	31
AAB – Computer Sciences, BA	-	50	98	113	106
Iliria – Computer Sciences – Applied Informatics	-	-	41	56	100
Riinvest, Software Engineering, BA	40	63	102	111	106
Riinvest, Software Engineering, MA	-	-	-	-	10

The combined number of enrolled students in ICT programs suggests that there might be a slight oversupply of ICT graduates coming out of the higher education system in Kosovo. The total number of students registered in 2011 in all ICT related programs offered in both, public and private universities, is 946. Provided only 10% of them graduate, which was the percentage with public university in

⁷ See for example: Ministry of Education Science & Technology: Katalogu i programeve të akredituara për zhvillim profesional të mësimdhënësve dhe të udhëheqësve të arsimit. Online: http://www.masht-gov.net/advCms/documents/katalogu_i_programeve_per_zhvillim_1.pdf

⁸ Malazogu, L.: Governance and Competition in Higher Education. KIPRED, 2007. http://www.kipred.org/advCms/documents/38875_Governance_and_Competition_in_Higher_Education.pdf

KIPRED's study from 2007, it would give in 2014 when they graduate, around 95 graduates ready to compete for a total of 79 new job positions planned in this year by the ICT companies. However, considering that not all new openings are ICT, some are for example sales, and considering that the graduation rate to registered students is higher with private universities, it is safer to expect a little higher oversupply of graduates coming from the higher education system.

Kosovo does not have yet an Academic and Research Network (ARN). Establishing ARN would help tremendously in breaking the encapsulation of higher education institutions currently operating in Kosovo. It would help tremendously the emerging of research and innovation⁸ within ICT education, which is at present non-existent.¹⁰

VOCATIONAL EDUCATION AND TRAINING (VET) PROVIDERS

The official data from the Ministry of Education Science and Technology (MEST) list some 22 VET schools¹¹ throughout Kosovo who provide trainings on 'electronics', which, to a degree, include some ICT trainings. However, these trainings consist of only basic computer-use trainings and then some office suite use trainings, which generally do not target typical employees in the ICT sector. The MEST states there were 6512 pupils in these schools, but no further break-down on since when, or on per-year basis. MEST does not provide data on private VET centers.

As stated, not one ICT company included in this research recalled any of the government-run VET schools as being a source of supply of their fresh employees or a place they would send their existing employees to a training. Despite the enormous investment poured in these government-run VET centers from both, international donors and the government, the results have been miniscule. Statements such as: "...In fact, less than 2% of the unemployed target population has benefitted from such state-organized capacity-building measures¹², and: "...they rather train their students on skills that are not necessarily in demand by the local ICT private and public sector"¹³ may illustrate why it may have been so. If anything, it has drawn a road not to continue with when considering an approach to VET in Kosovo.

There are only two types of VET centers that currently provide trainings of interest to the ICT sector in Kosovo: Cisco Networking Academies and Microsoft Academies /Microsoft Training Centers.

There are two Microsoft academies hosted one within the American University in Kosovo (AUK) and the other within Iliria University, and there is one Microsoft Training Center at CACTTUS company. The Microsoft Academies are entitled to provide trainings only to their regular students, preferably as a part of their study programs, while the Microsoft Training Center can provide trainings to their company clients and to citizens at large, and is thus better positioned to provide VET trainings and upgrade skills of existing employees. The fees for the same trainings vary though, and are generally more affordable within university settings.

The Cisco Networking Academies have no restrictions on who they are entitled to provide trainings to, apart, of course, from eventual restrictions originating by the institution they are operating within. STIKK could not obtain actual data on current enrollment in Cisco Networking academies, but it is believed that the numbers are high, primarily due to the relative affordability of such trainings, and then due to the undisputable quality of such trainings boasted by the relative success of the candidates that completed such trainings. Since the beginning of Kosovo's post-war era in 2001 and until 2009,

9 Barring the recent Innovation Center of Kosovo (<http://ickosovo.com/>), there cannot be identified an intentional system of innovation in Kosovo, either private or public.

10 See, for example: 1) Schuch, K.: Thematic Report, Science and Technology in Kosovo/UNMIK. Centre for Social Innovation, 2008. http://wbc-inco.net/object/document/7385/attach/Kosovo_Final.pdf
2) Ilazi, Lila, Bytyqi, Ahmedi, et al.: Kosovo ICT RTD Technological Audit Report. ICT-KOSEU, 2012. http://www.stikk-ks.org/uploads/downloads/Kosovo_ICT_RTD_Technological_Audit_Report_01.pdf

11 Ministry of Education Science and Technology: Vocational Schools & Profiles. Online. <http://www.masht-gov.net/advCms/?id=469&lng=Eng#id=37>

12 Luxembourg Agency for Development Cooperation, 2006, quoted on Gemic, S. and McFaden, K., (2009): Contributions of Private-sector ICT Workforce Training to Post-conflict Reconstruction: A Case Study from Kosovo. (p. 8).

13 Fazliu, A.: The unused power – Inception Report (ICT Sector). Swiss Cooperation Office in Kosovo, 2012.

NetAcad has trained over 4,200 ICT networking professionals and has developed into a major driver for local capacity-building efforts.¹⁴ STIKK believes that the total number of ICT networking professionals trained in Kosovo has gone over 5000.

The Cisco Networking Academies currently operating in Kosovo are: Atikos, Cactus, DataProgNet, Don Bosko, Information Development Initiative, PPC IT, and universities AUK, UBT and Universum.

4.4 ICT POLICY MAKING PERSPECTIVE

INVOLVEMENT OF THE ICT SECTOR IN THE DEVELOPMENT OF THE CURRICULA

ICT companies, educational/training institutions and the young IT professionals all believe that ICT companies should be involved in the process and consulted by both, public and private educational institutions, during the development of their ICT curricula. They believe that the best way to achieve this is through surveys, workshops and/or participation on the advisory boards. STIKK is also well suited to channel communication between the ICT and the educational sector by the merit of it being well organized, and representing the ICT sector as a whole.

Notwithstanding regulations that equally hinder educational sector, such as mandatory approval of training programs by MEST etc, private Educational/training institutions stress out that they are more flexible in adapting to the market demands, because there is too much bureaucracy with the public institutions in revising and refreshing their curricula.

Suitability of the current ICT educational programs

Only 9% of ICT firms and 16% of non-ICT firms completely agree that the educational program addresses the needed ICT skills. More so ICT firms (71%) than non-ICT firms (40%) consider that the educational program addresses “somewhat” the needed ICT skills.

To what degree does the educational program (curriculum) address the needed ICT skills?	ICT	Non-ICT
	%	%
Completely	9	16
Somewhat	71	40
Not so much	15	5
Not at all	2	10
Don't know	3	29

14 Gemici, S. and McFaden, K.: Contributions of Private-sector ICT Workforce Training to Post-conflict Reconstruction: A Case Study from Kosovo. 2009. (p. 9)

Consultations on the development of curricula (1/2)

The absolute majority of both ICT (87%) and non-ICT (85%) firms state that they have not been consulted by public educational institutions regarding the development of ICT curricula. A small portion of firms recall that they were consulted through surveys and workshops.

Has your company been consulted in any way by public educational institutions regarding the development of curriculum for ICT skills? If so, how?	ICT	Non-ICT
	%	%
By surveys	5	4
In workshops	4	3
Public debates	-	2
Other	-	1
We were not consulted	87	85
Don't know	2	5

Consultations on the development of curricula (2/2)

ICT and non-ICT firms at an equal 86% state that they have not been consulted by private educational institutions on the development of ICT curricula. Similarly, a small portion of firms were consulted through surveys and workshops. However, given the small incidence rate in this and the previous question, this response may be an error coming from the respondents' misinterpretation of previous research on the issue, say by STIKK, which might have been conducted with their company and misunderstood that it is being done by some "official" government party, and second, by the fact that this prior survey may have not been conducted with the current respondent who does not have all the facts.

Has your company been consulted in any way by private educational institutions regarding the development of curriculum for ICT skills? If so, how?	ICT	Non-ICT
	%	%
By surveys	3	2
In workshops	5	3
Public debates	2	3
Other	2	2
We were not consulted	86	86
Don't know	2	4

INVOLVEMENT OF THE ICT SECTOR IN THE POLICY MAKING PROCESS

Vast majority of businesses, both ICT (91%) and non-ICT (86%), are not involved in the policy making process by the government regarding to the preparation of the workforce for the ICT sector.

Has your company been involved in any way in the policy making process regarding ICT educational policies? If so, how?	ICT	Non-ICT
	%	%
By surveys	2	2
In workshops	2	1
Public debates	-	1
We were not consulted	91	85
Don't know	5	11

During the qualitative research, it came through very clear that ICT companies believe they should be involved and invited by the government in the policy making process related to education programs and the preparation of the workforce for the ICT sector, either through STIKK, or through representation on advisory boards or working groups.

In addition, participants do not seem reluctant to the idea that the students too should be included in the policy making process, either through surveys or working groups that would be able to articulate the students' perspective.

All participants also agree that the current curricula in both, public and private institutions, only partially addresses the skills needed by the ICT sector. The reasons noted are: study programs are old; they need new courses and updates, there should be more practice during studies, and the teaching staff should be more qualified and dedicated.

Educational and training institutions claim that they do develop new curricula based on the demand from the private sector, but also in combination with the expertise of the teaching staff and the "trends" (international, mostly European) and other factors which, as it seems, may be prevailing over the genuine demand from the sector.

All private universities claim to have alumni programs, whereas public universities do not have such programs.

4.5 DISCUSSION OF MAIN CHALLENGES AND OBSTACLES

Although almost every interviewee agrees that higher education degree is something “everyone should be equipped with”, the majority, including educational and training institutions still agree, that higher education degree may not be required if the person is qualified and able to perform the needed tasks. ICT companies, in particular, believe that it might be sufficient if their employees have completed specific ICT professional trainings. They believe people can be talented to perform specific tasks, and exploit on those talents, and not necessarily attain higher education.

Educational and training institutions, understandably, lean more on the side of formal education: they believe that having employees with higher education brings higher value to the private companies. But even so, these institutions too see professional trainings as mandatory for further and specific career advancements.

ICT companies state that graduates come out much better prepared professionally from public universities as opposed to private ones, on the grounds that the teaching staff in public universities is much more demanding, which makes the graduates much more prepared for the challenges of the workplace. The perception of more demanding teaching staff is an interesting one, since most of the teaching staff is shared between the universities, public and private, and so is the content of the courses they bring with them. It may happen that, factors other than great study programs and more demanding teaching staff are at play here. Lower tuition fees, cultural remnants of the past still influencing societal bias towards public vs. private (as in “not everything can be bought with the money”), past glory of the UP in contrast with the yet not established brand of new private universities, are just some of the ideas that come to mind. For similar reasons, it may be that the students prefer the public university, which then helps create the perception as above, while all along, in the words of a teacher at FIEK, it may be that “we just happen to get the best students to enroll with us, we do not make them any better. In some regards, it’s the contrary.”

Understandably, Educational and training institutions are split in half on the opinion whether public or private universities better prepare graduates for the ICT market, with each leaning towards their actual stand.

Young IT professionals believe that higher education is important, because it provides basic knowledge, but since there are not many profiles offered by the educational system, they think that companies usually look for skills and not necessarily higher education on their employees. They too believe that further training is a must in order to develop and enhance specific skills that are not provided by the formal education.

A comment by one of the company owners directed to the students may best provide a summary to the discussion: “why do I have to pay for your training while all along you were able to pay much more on your own, to waste time and learn things that you knew were not going to help you much anything in terms of employment?”

Which encourages us to continue by posing a simple question: why not include these so much praised vendor trainings in the regular study programs; have a portion of students’ tuition cover for that, and save some time and some money in the end? The total tuition fees may not even have to be

increased to meet this change. Most vendors have very attractive schemes for academic institutions and students, which sometimes include free books, software and even equipment. The private universities can easily accommodate such trainings, and some have already started. At the University of Prishtina the average total cost of tuition for a graduate has been calculated to be around 6000 Euro¹⁵, which is by no means negligible in the Kosovo context, and can easily cover for the vendor trainings that are required for the future employees in the ICT sector.

And as far as the established attitude in Kosovo on the value of such courses in the higher education, we have to recall that the primary goal of the newer three-years BA programs that Kosovo is transitioning to, is to prepare the workforce in the shortest period of time, and not necessarily to immerse in 'science', 'research' and other 'academic' synchronicities just for the sake of it, which incidentally, are nowhere to be seen in Kosovo anyway. But for the sake of it, should it be required, there are, or should be, MA and PhD programs for that sort of learning, and not necessarily BA.

5. MAIN FINDINGS

Sector slowdown. The situation in the ICT sector in Kosovo has not changed significantly in the period 2011 - 2013. The government has dropped several places on the ranking of biggest ICT market customers and is now surpassed by telecoms and financial sector. The real bad news is that the government has not done much to ensure favorable business environment and growth conditions for the ICT sector. The services segment and business process outsourcing seem to have had a strong growth and continue to present potential for further growth, but this is recognized and pursued off by very few of the actual ICT companies in Kosovo. Most other ICT companies see the local general business sector in Kosovo as a potential that could make a difference to their growth in the long term, but at present, this general businesses sector is not rushing to harness the potential of ICT in their production processes. The individual users /home users in Kosovo are being served mostly by the refurbished PCs and printers sales segment which is unaccounted for by any of the vendors, and is perceived to be many times the size of the purchases of new equipment by individuals, and then, in some part by gray imports. Unless the end of the year surprises with a burst of sales, as expected, by a consequence of notoriously delayed government tenders, it may happen that the ICT sector registers slower growth than previously expected.¹⁶

Typical employees in the ICT sector are well educated. Bachelor degrees seem to be the norm at 60% and an increasing number have a masters or higher degree (32%). Fresh employees come more from public universities than from private ones. They pursue programs with most technical skills on offer, and give less importance to soft skills, if at all. They believe that the choice of study programs they are offered is mostly out of date, that they are not getting enough practice, and that job market will be requiring more from them than what they are getting through formal education. Something along the lines of vendor trainings, though not exactly what, and who will pay for it, will help them land or keep a job in the ICT sector. They have little or no information on what jobs exactly are there and which skills are most required for these jobs. But getting a higher education degree, "something everyone should be equipped with", seems to have earned a status of universal social expectation, rather than originating as a requirement of the job market.

Educational institutions. There are currently five universities in Kosovo who offer ICT degrees: University of Prishtina, University for Business and Technology, Iliria University, University of Prizren

15 Malazogu, L.: Governance and Competition in Higher Education. KIPRED, 2007. http://www.kipred.org/advCms/documents/38875_Governance_and_Competition_in_Higher_Education.pdf

16 See, for example: IDC: Kosovo IT Market 2012–2016 Forecast and 2011 Vendor Shares. IDC, 2012. <http://www.idc.com/getdoc.jsp?containerId=ESQ04U>

and Univerzum University, and one more that offers non-degree ICT vendor courses: American University in Kosovo. ICT companies and students equally share the belief that study programs in universities do not exactly offer what is required by the industry, that the students get more theory and almost no practice, and that students will have to complete some ICT vendor trainings sooner or later in addition to higher education degree they are pursuing. The ICT companies seem to be almost equally satisfied with students coming from either public or private universities, although 73% of the current number of their employees comes from public University of Prishtina. The ICT companies are most satisfied with the new employees coming from the University of Prishtina, the reason being that it provides them with students that are “well prepared, capable and successful”. However, to paraphrase a teacher from this university, it may happen that “we (UP) just happen to get the best students to enroll with us, we do not make them any better. In some regards, it’s the contrary.”

The hard to obtain data on number of enrolled students indicate that there seem to be around 20% oversupply of ICT graduates coming out of the higher education system at present.

Private Vocational Education and Training institutions and centers, and especially vendor training centers, are much appreciated by both students and employers. Question arises as of why such trainings do not see their way into the formal education in Kosovo when almost every major vendor already has very affordable training programs tailored for educational institutions.

Skills missing, those important, and necessary. While the educational sector has been pumping up new graduates and embracing new degree programs, the long list of missing skills has yet to be addressed to match the needs of the ICT companies:

- **The missing skills** among the new employees are: Professional trainings and certifications (39%), Knowledge on how to use equipment (37%), Language skills (37%), Knowledge of operational procedures at work (26%), Management skills (22%) and Communication skills (20%).
- The skills regarded as **very important** by the ICT businesses are: Work Experience in similar positions, Formal education, Training and Certification, Knowledge in the use of equipment, Knowledge of work operational procedures, Language skills, Communication skills, Management skills, Ability to train other workers, Interpersonal skills, Time management skills, Problem-solving skills. Between managerial skills and technical skills, ICT companies consider that technical skills of their employees are just a little more important (54%) than managerial skills (45%).
- **The most needed technical skills** by ICT firms are: Advanced Networks – CCNP (37%), Server-Client Programming - Java, C++ (32%), Database Administration - MS SQL, Oracle, MySQL (31%), System Administration - MS Windows Server, Exchange Server (28%), Web Programming - PHP, ASP, Perl, Python (22%) and Web design and Photo editing (17%).
- **The most needed management skills** by ICT firms are: Sales skills (45%), Project management skills (35%), and Marketing skills (29%).

Training of employees is conducted within the company by 83% of ICT firms while only 3% train their employees outside the firm. Only 11% don't train employees at all. The training they provide to their employees is less general and more specialized ICT training such as: Computer networks (22%), How to use equipment (17%), Hardware repair and maintenance (11%), Sales and marketing training (11%), Database trainings (11%), GIS (11%), followed by Web design (6%), Customer care (6%), AutoCAD (6%), and MS Office (6%).

In the course of **policy making process** affecting the ICT sector, there is still **no systematic dialogue** between ICT companies, educational providers and education policy makers. We believe this is the one main reason why "...Kosovo continues to be plagued by an education system that at all levels fails to address the pedagogic and skills training needs of its students and the economy. ...the quality of graduates is poor and out of sync with workforce requirements".¹⁷

Curricula development process for ICT study programs, at either public or private educational institutions, as per the response of more than 85% of ICT and non-ICT firms, has not included or consulted those firms in any way. Vast majority of businesses, both ICT (91%) and non-ICT (86%), are **not involved in the policy making** process by the government with regard to the preparation of the workforce for the ICT sector.

A comparison between ICT and non-ICT businesses over same common issues reveals the following findings:

- Only 20% of non-ICT firms have IT staff on their employee list, whereas the rest outsources by contracting to someone outside their company.
- IT staff of non-ICT companies is a little less educated; close to half of them (46%) have bachelor degrees, 19% have master degrees or more and 23% have finished only the high school.
- Majority of IT staff both in ICT and non-ICT companies comes from public institutions. ICT companies have a little more staff (73%) coming from public institutions than non-ICT companies (62%).
- Both ICT and non-ICT companies are relatively satisfied with the higher education institutions they are getting fresh employees from – though slightly more satisfied with public institutions. Interestingly, the majority of non-ICT companies (83%) do not know (or do not bother) which institution supplies them with best employees.
- Only 9% of ICT firms and 16% of non-ICT firms completely agree that the educational program (curricula) addresses the skills needed by the ICT sector. More so ICT firms (71%) than non-ICT firms (40%) agree that the educational program (curricula) addresses "somewhat" the needed skills in the ICT sector.
- The main missing skill identified by non-ICT firms is *Work experience in similar position* (41%), followed by *Training and Certifications* (22%), *Knowledge in the use of equipment* (22%) and *Time management skills* (22%).
- The non-ICT firms provide more training to their employees on how to use equipment (55%) than ICT firms which do so at 17%. ICT firms provide more specialized ICT trainings to their employees.

17 USAID: Kosovo Country Development Cooperation Strategy 2014-2018. Online. (p.7) http://www.usaid.gov/sites/default/files/documents/1863/CDCS_Kosovo.pdf

- Less than half (48%) of non-ICT firms train their employees within their company and 12% train them outside their firms, while 37% do not train their employees at all.
- ICT firms take longer to fill-in vacancies: only 28% within two weeks, 17% within 3-4 weeks and the rest up to 2 months. Non-ICT companies can hire within 2 weeks in 48% cases.
- It generally takes longer for ICT firms to train their employees. For 68% ICT firms it takes 1-3 months to train new employees, while this is true for 56% of non-ICT firms.
- ICT firms have a more balanced gender structure at managerial levels, though not by much: 80/20 ICT vs. 92/8 non-ICT, male/female.
- ICT firms hire more often through public announcements 60% vs. 39%, and rely less on family members, personal contacts and references, 45% vs. 76%, ICT vs. non-ICT.
- ICT firms are more willing to hire interns (58%) than non-ICT firms (29%).

6. RECOMMENDATIONS

RECOMMENDATIONS FOR THE GOVERNMENT

- As a matter of urgency, mandate all educational institutions, public and private, to allow transfer of credits for completed courses. Issue punitive measures for non-compliance, if necessary, up to the revoking of accreditation and license.
- Allow all educational institutions, public and private, to include in their ICT programs vendor certification leading courses at the BA level of higher education system.
- Mandate all institutions to develop study programs for part-time students: allow programs based on per-course payments rather than per semester/year payments for all courses, in all programs, at any level of higher education. Allow these courses' credits to accumulate towards achieving any matching degree program.
- Mandate all educational institutions, public and private, to maintain a database of students at all programs, including application data, enrollment, enrollment and success rate on a per course basis, per semester-basis, as well as data on graduated students. All aggregate data, or data not infringing personal data protection safeguards, should be freely available to all parties at all times.
- Provide grants and other incentives to institutions that achieve highest number of students' employability, thus help create a culture of career development and alumni programs within higher education in Kosovo.
- Provide incentives for educational institutions to establish ICT start-up incubators within the institutions.
- Increase public funding for ICT innovation and R&D.
- Establish Academic and Research Network of Kosovo, to help connect higher education institutions with their peers both locally and internationally.
- Establish scholarship program for ICT students.
- Establish awards programs for best ICT education institutions.

RECOMMENDATIONS FOR STIKK

- Organize ICT trainings that have been identified as needed but that are currently not offered in Kosovo.
- Establish an independent ICT Academy, to develop an ICT degree program, in business partnership with local ICT training companies – STIKK members that are already offering ICT trainings of value.
- Create a sub-cluster for Academia Partners members within STIKK.
- Promote ICT Education to the future students.
- Create student placement platform – Internship Program.
- Take the lead in establishing the Academic and Research Network of Kosovo (ARN). Identify stakeholders, organize discussions, and push forward for an independent ARN to serve all ICT community in Kosovo.

RECOMMENDATIONS FOR DONORS AND POTENTIAL INVESTORS

- Provide assistance to STIKK to establish an independent ICT Academy, a joint enterprise with its members - ICT companies and institutions already offering ICT trainings and ICT study programs.
- Provide assistance to STIKK to start developing ICT trainings that are currently not available in Kosovo. Trainings to be included in the future ICT Academy or to be spun off to member companies or institutions.
- Provide grants and subsidies to local ICT training and education companies and institutions to develop new programs of study relevant to the needs of the job market in Kosovo and the markets which would potentially absorb these new graduates provided they were available.
- Provide assistance to STIKK to continue conducting research on the skills needs in the sector.
- Provide scholarships to best ICT students to continue studies either locally or abroad.
- Foster linkages between local companies, associations and education institutions and their peers in other countries.

7. REFERENCES

1. Nikaj, B. and Lila, A.: *ICT Skills Gap Analysis*. STIKK, 2011.
http://www.stikk-ks.org/uploads/downloads/Skills_Gap_Analysis_for_Information_and_Communication_Technology_02.pdf
2. Shaipi, K.: *ICT in Kosovo – A sector decoded*. STIKK, 2010.
http://www.stikk-ks.org/uploads/downloads/Demand_Supply_Survey_IQ_Consulting_02.pdf
3. ESI Center: *Analysis of ICT Industry in Kosovo - Economic Region Center*. ESI, 2011.
http://www.esicenter.bg/content/EN/library/ICT%20sector%20analysis_Kosovo_v1.pdf
4. IDC: *Kosovo IT Market 2012–2016 Forecast and 2011 Vendor Shares*. IDC, 2012.
<http://www.idc.com/getdoc.jsp?containerId=ESQ04U>
5. Shaipi, K.: *Public Procurement for ICT in the period June 2009-June 2012 – Findings Report*. STIKK 2012. http://www.stikk-ks.org/uploads/downloads/Public_Procurement_for_ICT_June_2009-June_2012.pdf
6. Malazogu, L.: *Governance and Competition in Higher Education*. KIPRED, 2007.
http://www.kipred.org/advCms/documents/38875_Governance_and_Competition_in_Higher_Education.pdf
7. USAID: *Kosovo Country Development Cooperation Strategy 2014-2018*.
http://www.usaid.gov/sites/default/files/documents/1863/CDCS_Kosovo.pdf
8. Gemici, S. and McFaden, K.: *Contributions of Private-sector ICT Workforce Training to Post-conflict Reconstruction: A Case Study from Kosovo*. 2009.
9. Fazliu, A.: *The unused power – Inception Report (ICT Sector)*. Swiss Cooperation Office in Kosovo, 2012.
10. Schuch, K.: *Thematic Report, Science and Technology in Kosovo/UNMIK*. Centre for Social Innovation, 2008. http://wbc-inco.net/object/document/7385/attach/Kosovo_Final.pdf
11. Ilazi, Lila, Bytyqi, Ahmedi, et al.: *Kosovo ICT RTD Technological Audit Report*. ICT-KOSEU, 2012.
http://www.stikk-ks.org/uploads/downloads/Kosovo_ICT_RTDTechnological_Audit_Report_01.pdf
12. Innovation Centre Kosovo: <http://ickosovo.com/>
13. Ministry of Education Science & Technology: *Katalogu i programeve të akredituara për zhvillim profesional të mësimdhënësve dhe të udhëheqësve të arsimit*. Online.
http://www.masht-gov.net/advCms/documents/katalogu_i_programeve_per_zhvillim_1.pdf
14. Ministry of Education Science & Technology: *Vocational Schools & Profiles*. Online.
<http://www.masht-gov.net/advCms/?id=469&lng=Eng#id=37>
15. European Agency for Reconstruction: *Quarterly report to the European Parliament, January to March 2008*. Online.
http://ec.europa.eu/enlargement/archives/ear/publications/main/pub-reports_quarterly_2008_january-march.htm#Kosovo

8. FIELD INTERVIEWS - QUANTITATIVE SURVEY

The field interviews were conducted during September 6-28, 2013. They were face to face, paper and pencil, “in offices” of the respondent. The sample size consisted of 513 effective interviews, out of which 65 were ICT companies and 448 other businesses, medium sized companies with around 50k to 1M and over 1M in turnover, chosen by random sampling from the database of active registered businesses. The questionnaire was close-ended, pre-code open-ended and open ended questions, and it took around 30 minutes in average to complete. The interviewees were company owners, higher management representatives or IT Managers. About 17% of the interviews were back-checked in the field.

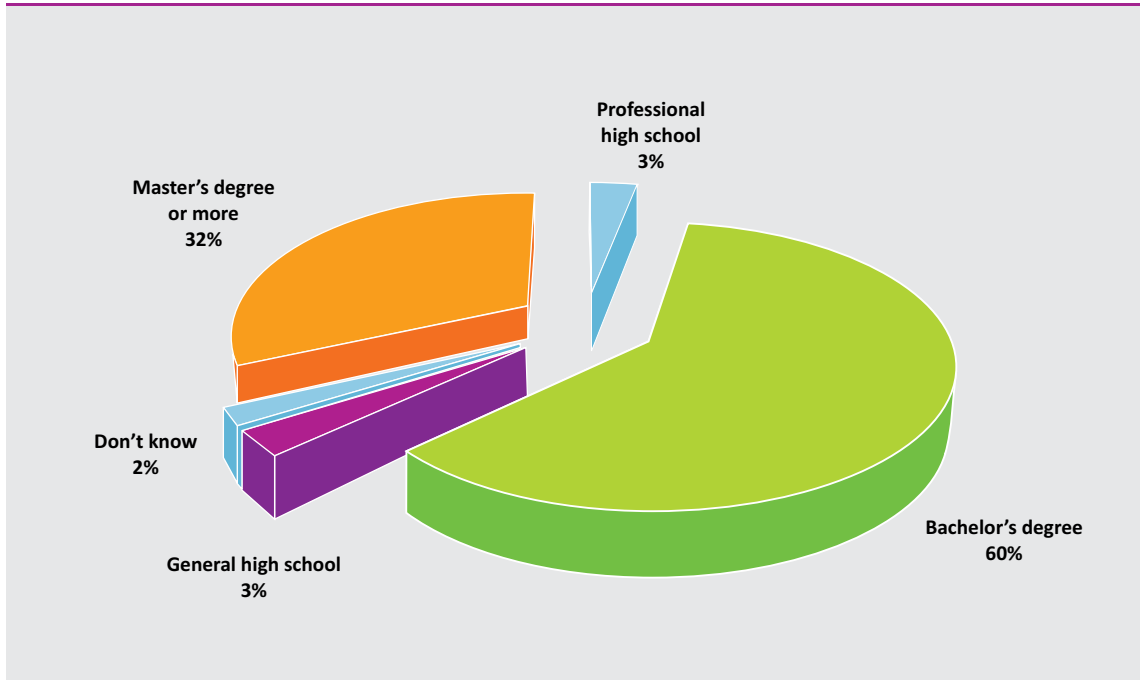
Q1:

According to the skills that your employees should have, how important are these?

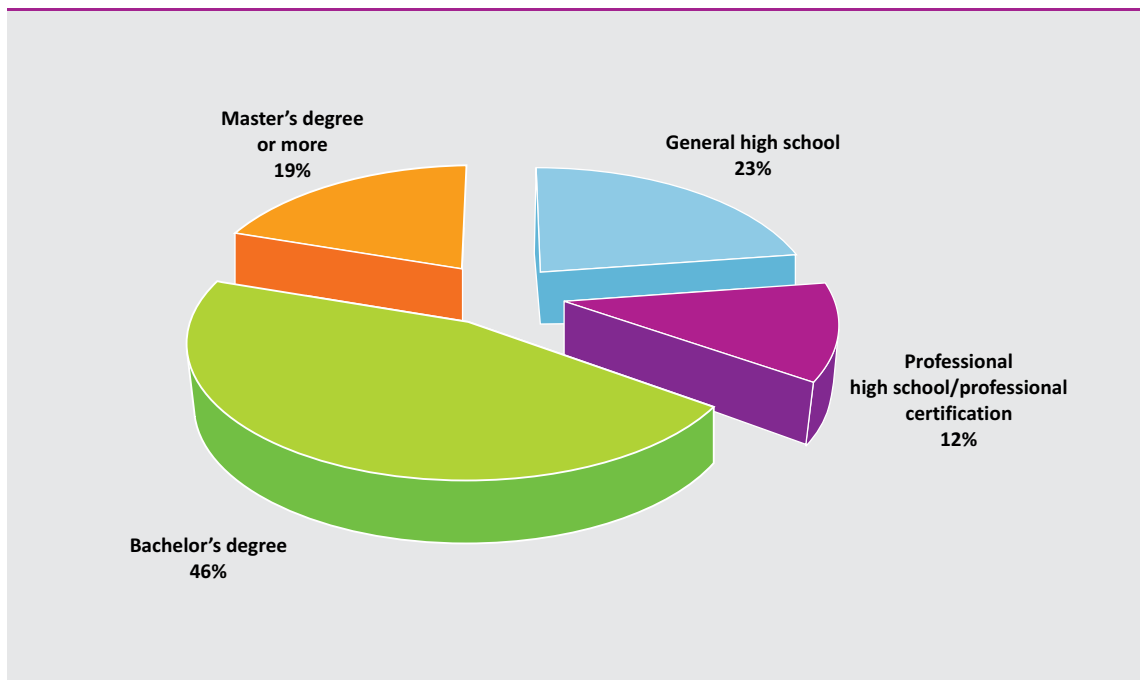


Q2:

Highest level of education of new employees in your company (ICT)



Highest level of education of new IT employees in your company (Non-ICT)

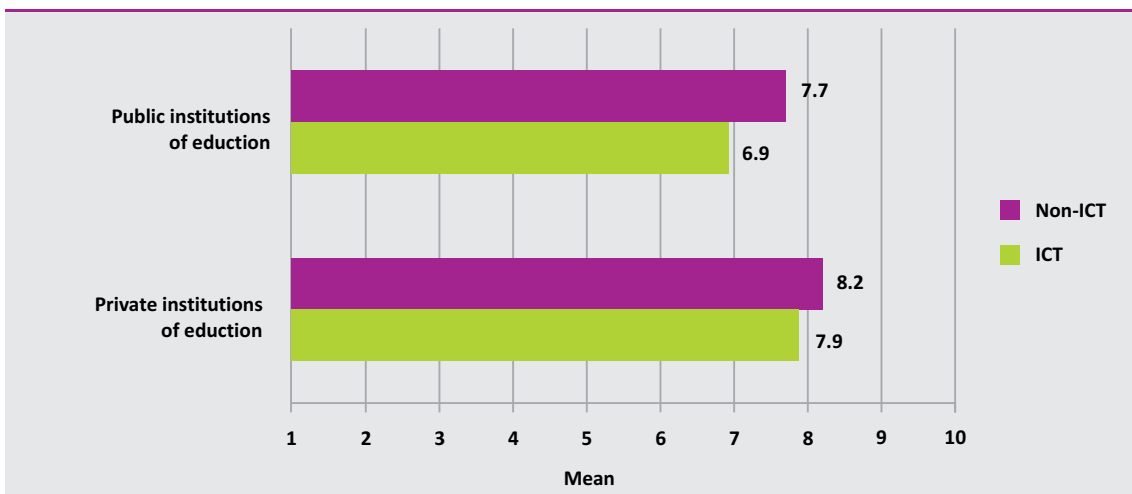


Q3:

Where did your employees get their education from?	ICT	Non-ICT
	%	%
Public HE Institutions of Education	73	62
Private HE Institutions of Education	27	38

Q4:

**How satisfied are you with your IT employees that come from...?
(1-not satisfied at all and 10-very satisfied)**

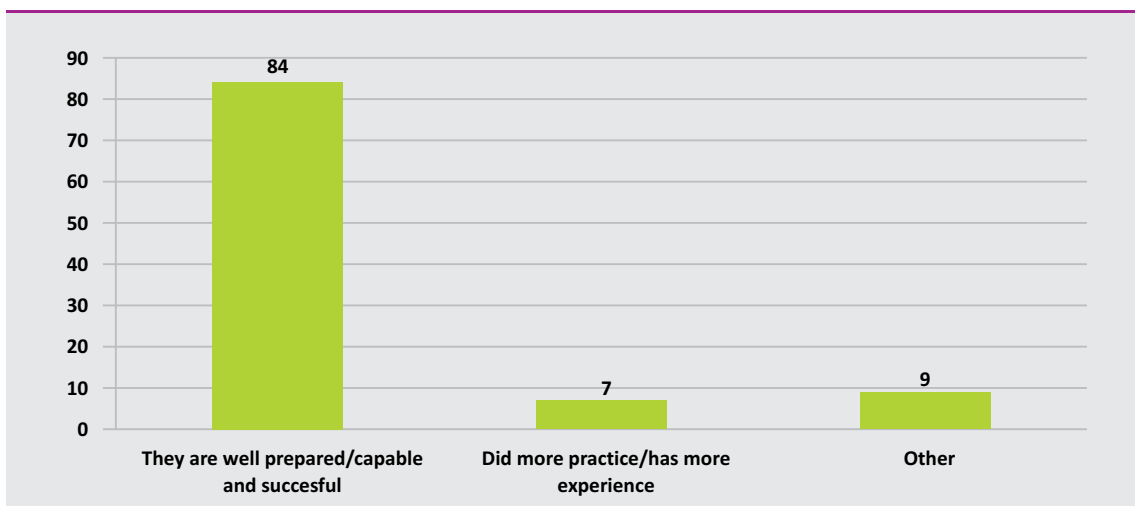


Q5:

From which institutions of education do your best ICT employees come from?	ICT	Non-ICT
	%	%
Faculty of Electrical and Computer Engineering - FIEK	26	3.1
Prishtina University	17	3.3
Faculty of Economics - UP	12	0.9
AUK	9	0.9
UBT	8	1.1
FMNS - Computer Sciences	6	0.9
AAB	5	1.1
Faculty of Civil Engineering	3	-
Faculty of Business - Pejë	2	-
Economic School - Ferizaj	2	-
Iliria	2	0.2
Other	-	5.1
Don't know	8	83.4

Q6:

Why were you satisfied with graduated students of this instituon? (ICT)



Q7:

From which educational institutions do your employ-ees come from that you're least satisfied with?	ICT	Non-ICT
	%	%
University of Prishtina	5	0.2
Faculty of Economics - UP	3	0.2
Iliria	3	-
AAB	3	0.2
FSHMN - Computer Sciences	3	-
Faculty of Law	2	-
FSHMN - Geography Department	2	-
Faculty of Electrical and Computer Engineering - FIEK	-	0.2
Fama	-	0.2
Don't know	79	99

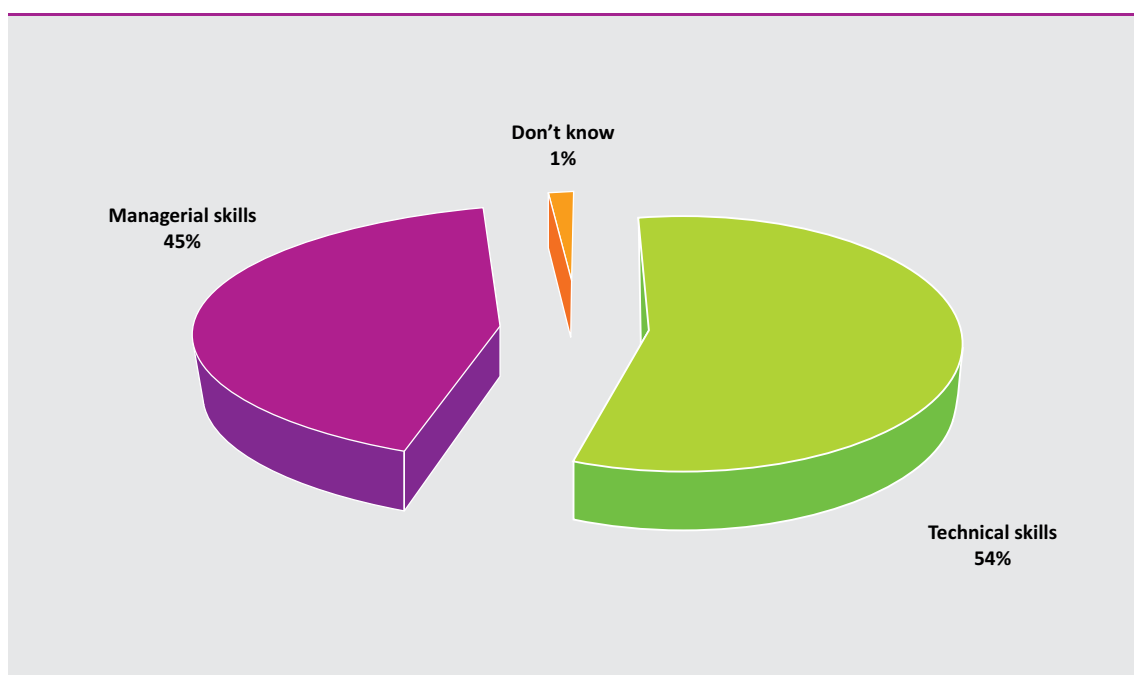
Q8:

What are the skills that new employees lack mostly? (cumulative percent of three mentions)	ICT
	%
Professional trainings and certifications	39
Knowledge on how to use the equipment	37
Language skills	37
Knowledge of operational procedures at work	26
Management skills	22
Communication skills	20
Skills to train other workers	17
Problem-solving skills	12

What are the skills that new ICT employees lack mostly? (cumulative percent of three mentions)	Non- ICT
	%
Work experience in similar position	41
Training and Certifications	22
Knowledge in the use of equipment	22
Time management skills	22
Language skills	14
Management skills	14
Communication Skills	10
Knowledge of work operational procedures	10
Inter-personal skills	9
Skills to train other workers	8
Formal education	5
Problem-solving skills	5
Other	1

Q9:

Which of these 2 groups of skills is more important for your company?



Q10:

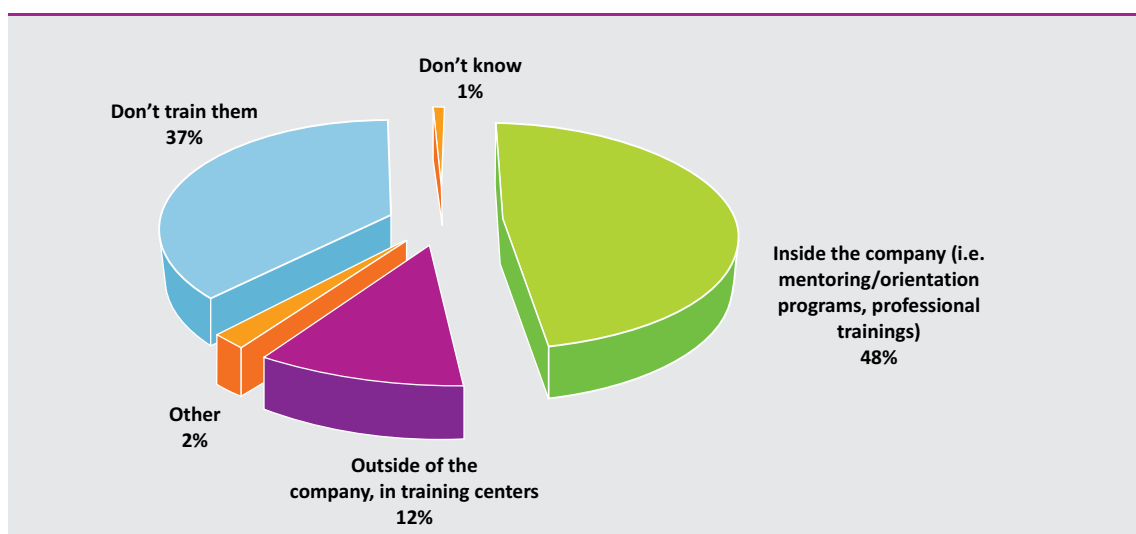
Which of these technical skills does your company need most? (cumulative percent of three mentions)	ICT
	%
Advanced Networks (CCNP)	37
Server-Client Programming (Java, C++)	32
Database Administration (MS SQL, Oracle, MySQL)	31
System Administration (MS Windows Server, Exchange Server)	28
Web Programming (PHP, ASP, Perl, Python)	22
Web Design (Html, JavaScript, photo editing skills)	17
Basic technical skills (ECDL, Cisco IT Essentials 1)	8
Administrators of Linux Systems	8
Basic Network Computing (CCNA)	6

Q11:

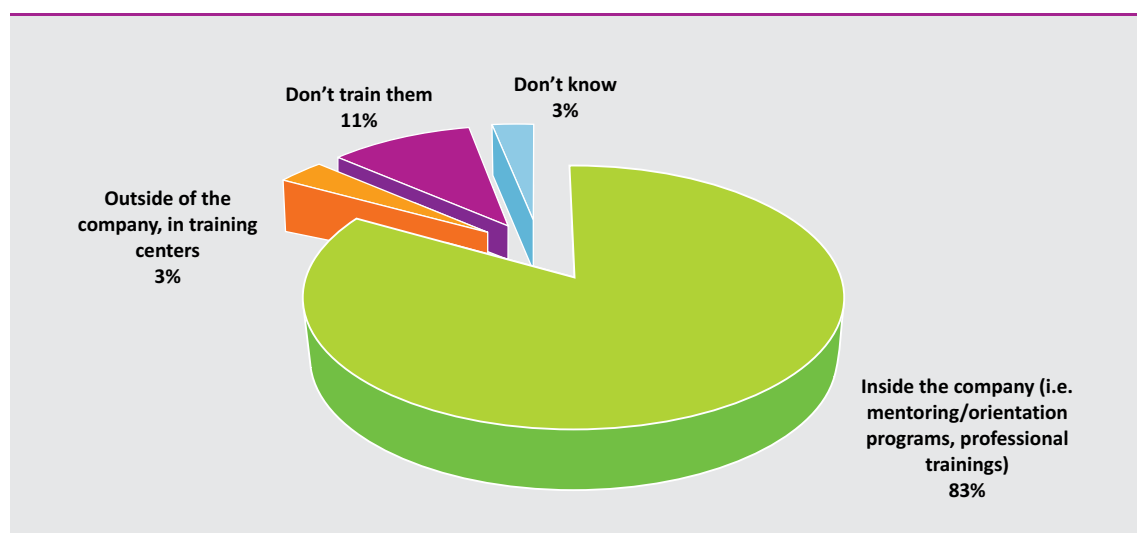
Which of these management skills does your company need most? (cumulative percent of three mentions)	ICT
	%
Sales management	45
Project management	35
Marketing management	29
Contract management	22
Business analyst	20
Financial management	3
Human resources management	3

Q12:

How do you train your employees? (Non-ICT)



How do you train your employees? (ICT)

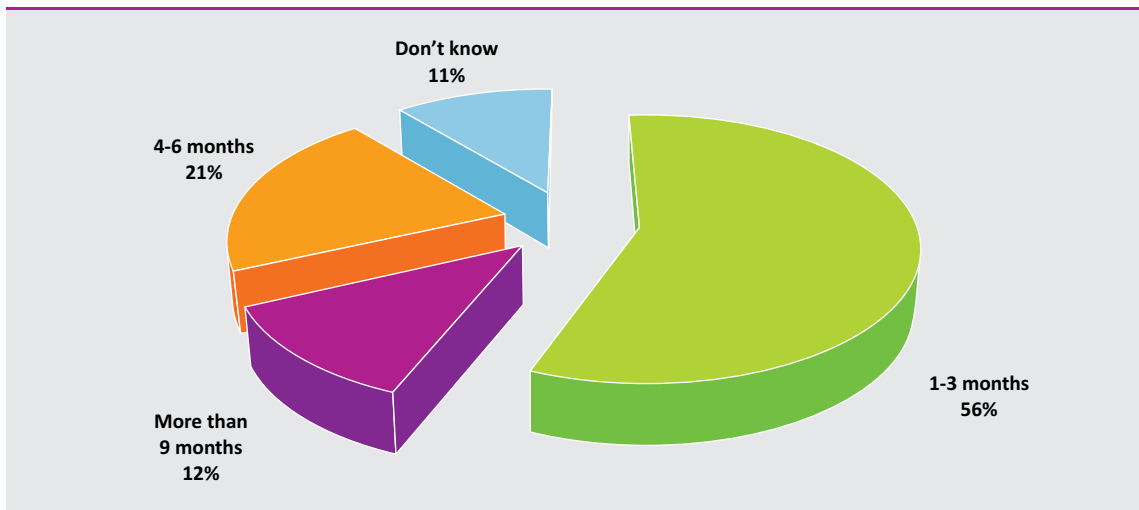


Q13:

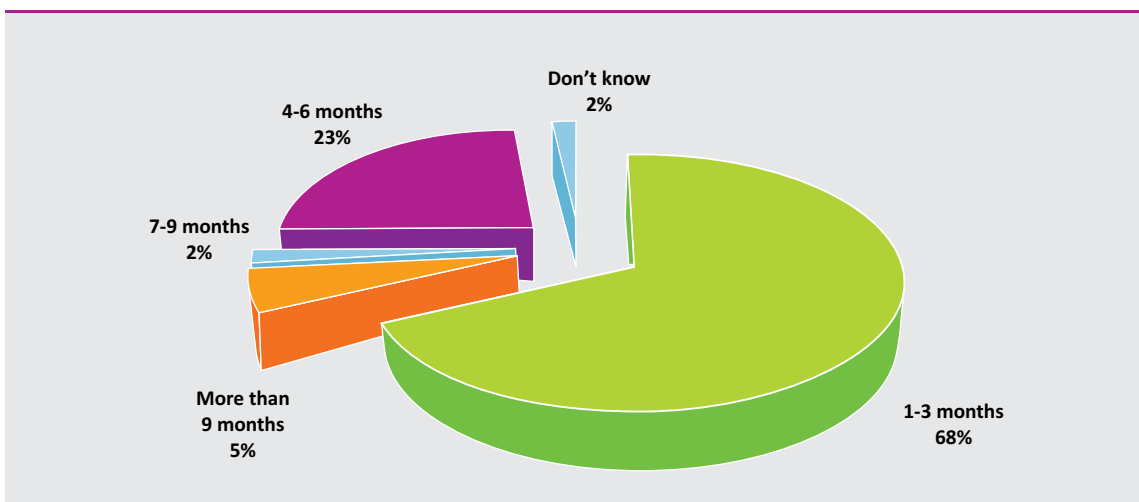
What kind of trainings have you offered / do offer to your employees? (cumulative percent of three mentions)	ICT	Non- ICT
	%	%
Internal Training/How to use equipment	17	55
Computer networks training	11	2
Web Design	6	-
Training in different workshops	6	2
Training for Microsoft Office	6	-
Hardware repair and maintenance	11	23
Basic trainings	6	4
Customer Care	6	6
Sales and Marketing trainings	11	4
Training for Accounting Software	11	9
IT trainings (other IT training)	17	-
Database training	11	-
Cisco	11	-
GIS	11	2
Arc-GIS	6	-
Auto-CAD	6	-
Professional trainings	-	9
Graphic Design	-	4
Management trainings	-	6
Cultural heritage	-	2
Tutorial	-	2
Other	-	13

Q14:

Time needed for training new employees for ICT (Non-ICT)

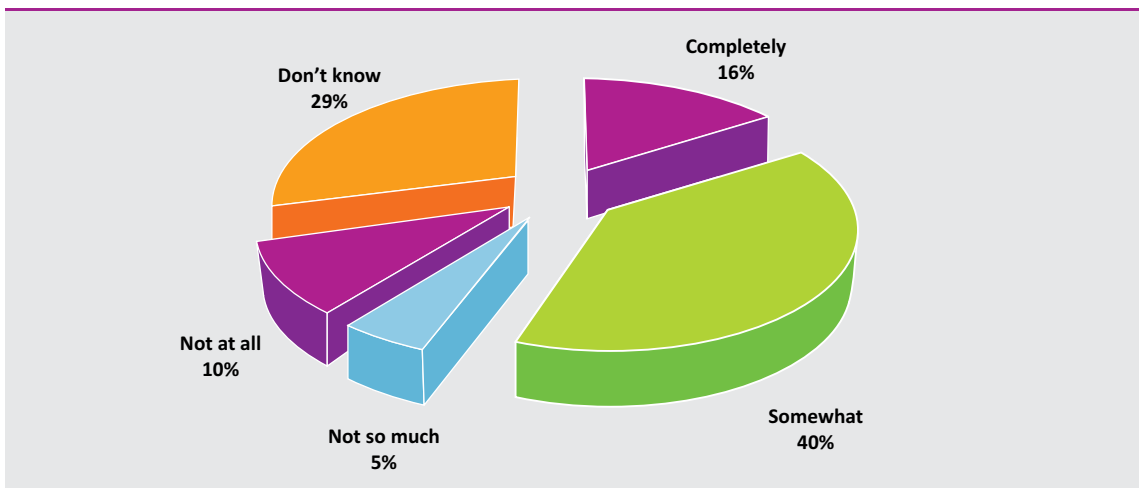


Time needed for training new employees (ICT)

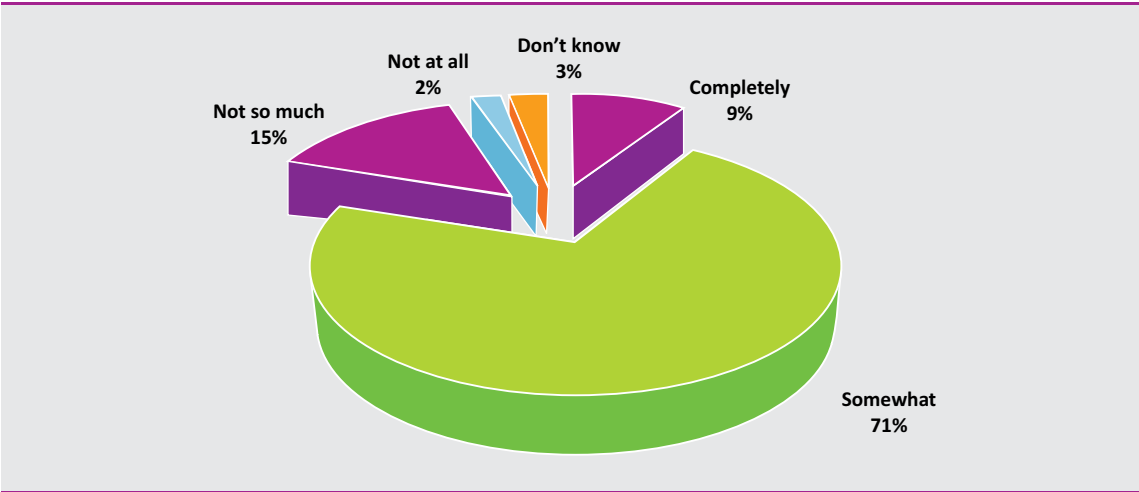


Q15:

Does the educational program (curriculum) address the needed working skills in ICT sector? (Non-ICT)

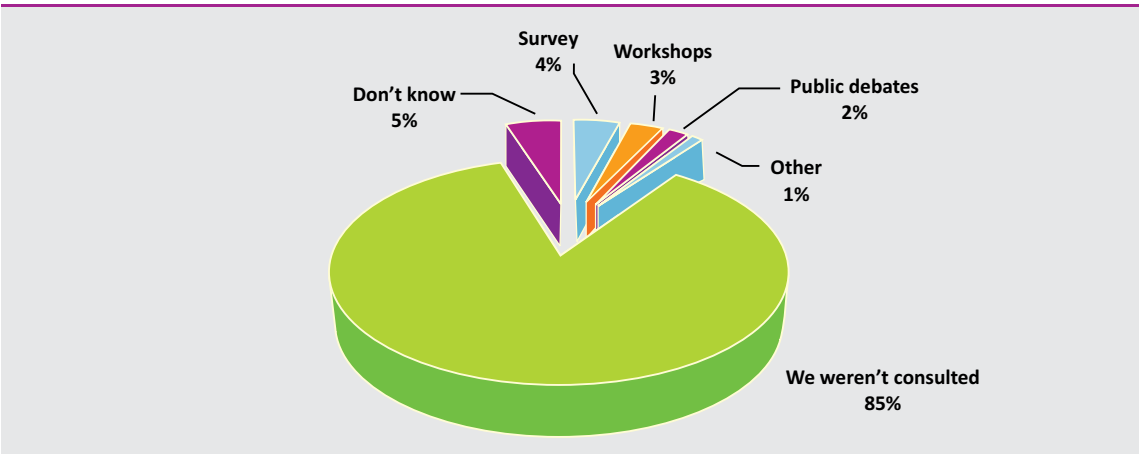


Does the educational program (curriculum) address the needed working skills in ICT sector? (ICT)

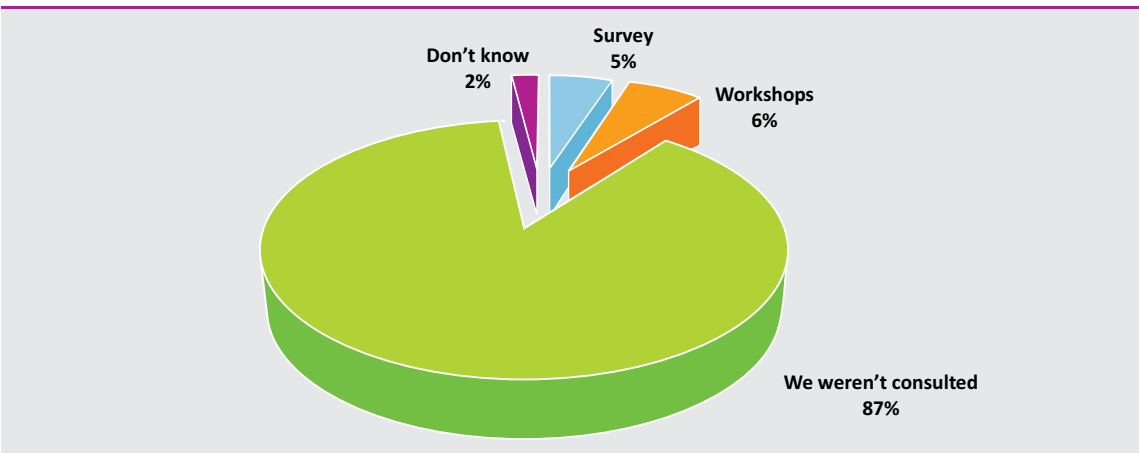


Q16:

Was your company consulted in any way from public institutions of education or institutions that offer trainings, regarding development of the program (curriculum? If Yes, how? (Non-ICT)

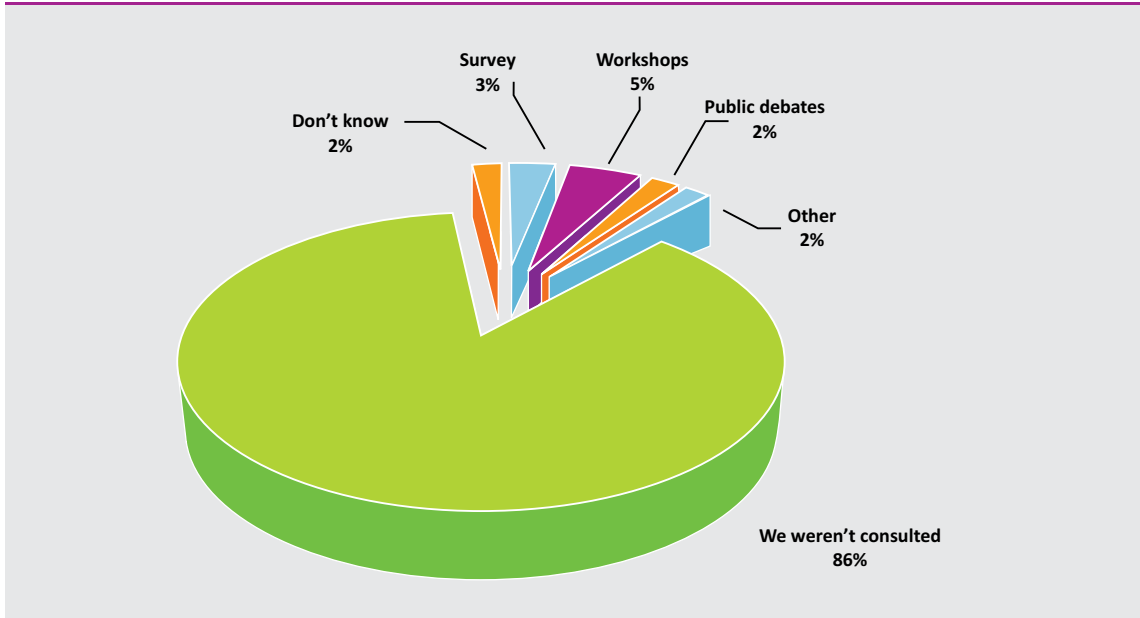


Was your company consulted in any way from public institutions of education or institutions that offer trainings, regarding development of the program (curriculum? If Yes, how? (ICT)

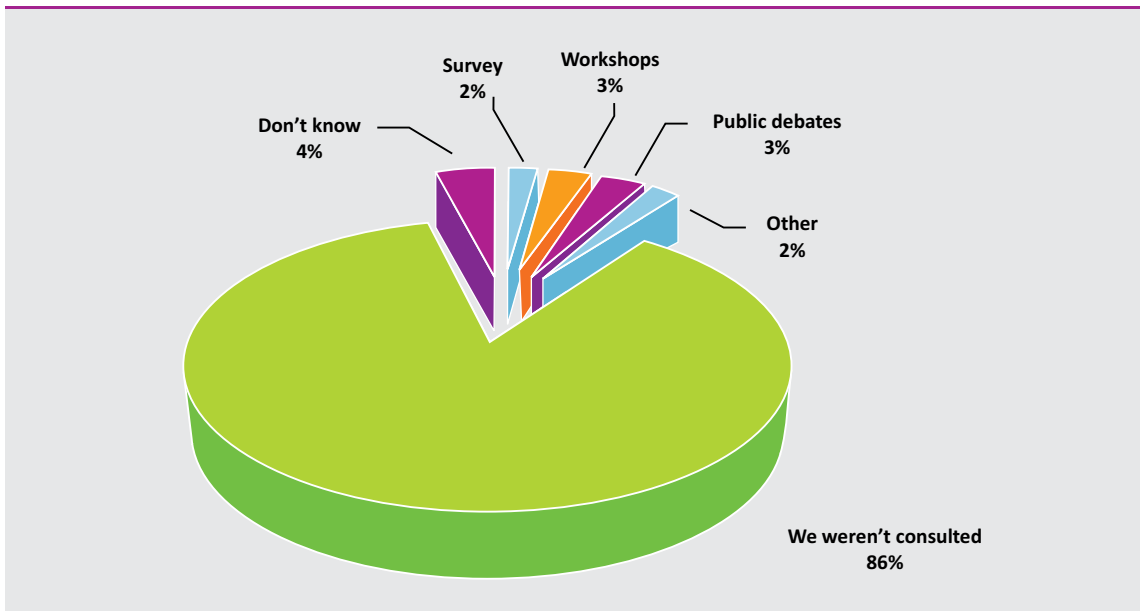


Q17:

Was your company consulted in any way from private institutions of education or institutions that offer trainings, regarding development of the program (curriculum? If Yes, how? (ICT)

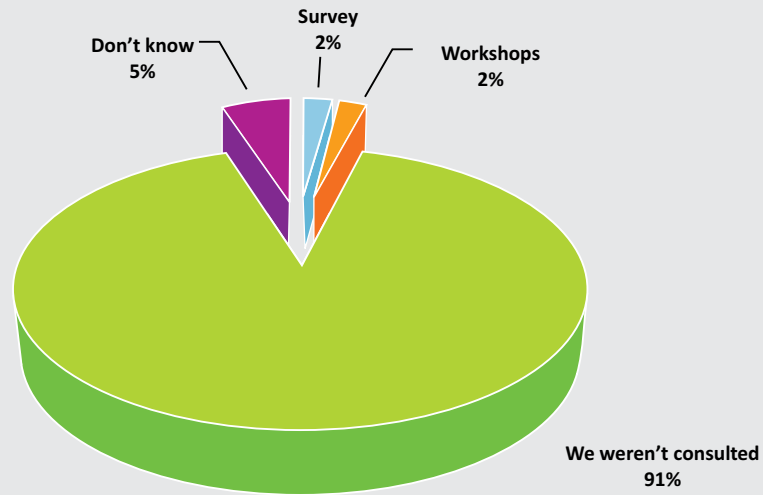


Was your company consulted in any way from private institutions of education or institutions that offer trainings, regarding development of the program (curriculum? If Yes, how? (Non-ICT)

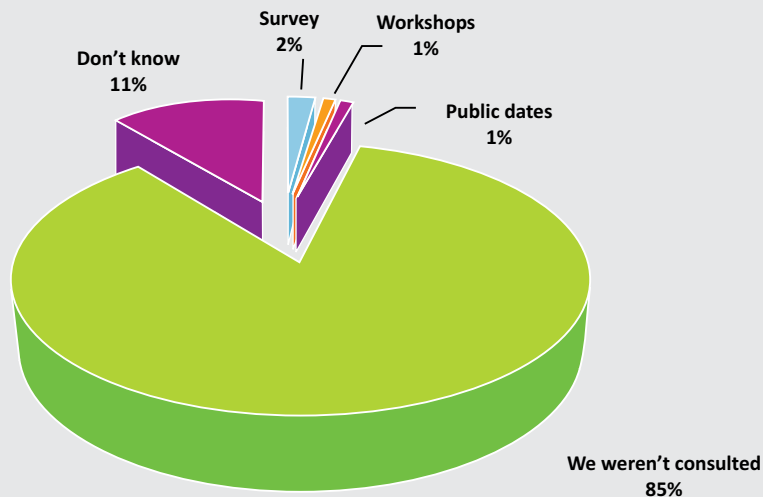


Q18:

Was your company involved in any way in the policy making process regarding educational policies? (ICT)



Was your company involved in any way in the policy making process regarding educational policies? (Non-ICT)





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EYE Enhancing Youth Employment Project



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Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Cooperation Office Kosovo