

# The Employer Perspective on Employability

Gunhild M. Lundberg

Dep. of Computer Science

Norwegian University of Science and Technology

Trondheim, Norway

[gunhild.lundberg@ntnu.no](mailto:gunhild.lundberg@ntnu.no)

André Gaustad

Dep. of Computer Science

Norwegian University of Science and Technology

Trondheim, Norway

[andre.gaustad@ntnu.no](mailto:andre.gaustad@ntnu.no)

Birgit R. Krogstie

Dep. of Computer Science

Norwegian University of Science and Technology

Trondheim, Norway

[birgit.r.krogstie@ntnu.no](mailto:birgit.r.krogstie@ntnu.no)

**Abstract**—Employability is a term used for describing the skills, knowledge and personal qualities a graduate should possess to get a job. In this paper we suggest what these skills and qualities are for IT undergraduates specializing in network administration. We have interviewed 10 recruitment managers from 9 different companies who have employed candidates from an IT network administration study program. They suggest that personal qualities are the most important aspect they look for in the graduates. We found that several of the recruiters want the graduates to have an interest in technology also outside of the curricular activities or work setting. This type of interest is taken as a sign that the graduate/job seeker is able to employ their knowledge in practice and engage in continuous self-development and lifelong learning, validating their employability. We discuss how the university can cater for curricular as well as extra-curricular activities, thus leveraging as well as developing the interest in the field valued by employers.

**Keywords**— *Higher Education; Employability; Interest; Undergraduates,*

## I. INTRODUCTION

An important issue in Higher Education research is what it means to be ready for employment. The primary goal for a university is to educate students so that they can start working after ended study. Also for the graduate the goal is often to be able to acquire a certain job within a specific field. Being ready for a career is often referred to in the literature as employability.

The term employability is used with no clear agreement among authors of what is actually included [1]. The employers seems to value different skills and attributes, and that there is no consistent use of terms used for describing these skills and attributes[2]. Most papers try to split employability into several categories, before defining what is included in the term. Employability can be split as skills and knowledge, without the personal aspect[3], while other split employability in categories like “Personal qualities and people skills, professional knowledge and skills, and technology knowledge and skills”[4]. Employability has also been defined as a combination of basic knowledge/skills and applied skills, Where basic knowledge/skills is fundamental, the applied skills are seen as much more important to be successful at work [5]. Some skills

are more commonly cited than others, like communication, team working, information technology and planning and organizing. The personal attributes that occur most often in research on employment include flexibility, adaptability, hardworking, commitment and dedication [1].

In this paper we use the term employability as: “a set of achievements, skills, understandings and personal attributes, that make graduates more likely to gain employment and be successful in their chosen occupations, which benefits themselves, the workforce, the community and the economy” [6]. We understand grades or experiences you could put in the diploma as achievements, while skills are interpreted as something a graduate can gain by practicing or training. Understandings explains what a graduate should comprehend, whereas personal attributes are characteristics about a person that are relatively constant. Personal attributes is also seen as inherent and not teachable in a employability study for recently graduated computer programmers [7].

In addition to skills and personal attributes, engagement is seen by some researchers to have a connection to employability. “We are left with the clear impression that the weight of argument and evidence supports the view that Student Community Engagement has a positive impact on student employability, at least initially” [8]. Another study argue that inner drive and interest in the field is one of the most important qualities to have for a graduate computer programmer to be attractive for a IT company [7].

The Higher Education Institution (HEI) facilitates opportunities for the graduate to develop employability through 1) development of attributes (important in obtaining, keeping and developing jobs or careers), 2) self-presentational skills (important when seeking jobs) and 3) encouraging a love of learning and a willingness and awareness of the need to continue learning [9].

Curricula or experiences alone do not make a graduate develop a high degree of employability. “The curricular process may facilitate the development of prerequisites appropriate to employment, but does not guarantee it. Hence it is inappropriate

to assume that students are highly employable on the basis of curricular provision alone: it may be a good harbinger, but it is not an assurance of employability. Employability derives from the ways in which the student learns from his or her experiences” [6]. Experiences outside the curriculum and the HEI may have an effect of the employability of the graduate [6].

[9] argues that the graduates themselves need to take actions to use these opportunities offered by the HEI to become more employable, and they can also increase their employability by engaging in activity outside of the HEI. This include students’ previous experience, their extra-curricular activities, their career intentions and networks, and the quality and availability of the employability experience within the institution, particularly that which is integral to and explicit in their program of study. Employability skills are only partially contingent on what is provided by the institution [9].

To illustrate the situation today, as described by the literature, Figure 1 was made. There the HEI provides curricular activities that the graduate can participate in. These activities increase the employability of the graduate, which include the four aspects described by [6]. The graduate can also participate in extra-curricular activities, e.g. student community engagement, which also affects employability.

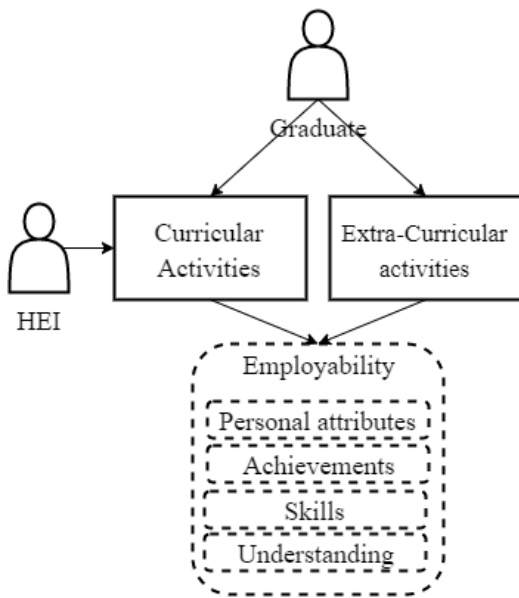


Figure 1: Employability deriving from curricular as well as extra-curricular activities

On this background, this paper explores how the employability of graduates in IT Network Administration is perceived by employers, what skills the graduate need to possess, which personal qualities the students need to get employed, and whether these qualities result from curricular or other activity. In this case the term graduate refers to undergraduates. Also, we discuss how the desired employability can be fostered by the higher education institution.

## II. CASE

The study program selected for this case-study was established as an informatics bachelor program in 2005 and has consistently received good reviews in surveys among post-graduates. The latest candidate survey indicated that IT Network Administration candidates were more likely to gain employment after graduation than students from comparable study programs within the institution. The perception that these candidates are attractive is also bolstered by the amount of activities that are arranged by potential employers for the senior students, such as presentations and pre-graduation interviews. The hypothesis among the teaching staff at the university has been that these candidates are attractive because of a high degree of collaboration with external businesses and a focus on student-active learning methods. The curriculum has been adjusted frequently according to market demands, and a high degree of team-based practical work has been implemented with a teaching staff focused on upcoming trends within the field. An example is the use of virtualization technology that was implemented in 2008 both as a platform for students’ lab-exercises and as part of the curriculum in classes. The study program is based on early implementation of new products and services with updated product versions of operating systems, management systems, virtualization platforms, and cloud services. Several partnerships with providers of both software and services has been instrumental to achieve this learning environment.

During their first semester students are required to work with projects in teams with simulated real-world exercises and present their findings and results to the rest of the class. This method of learning is also used in the second and third year, where several of the grades are based on team achievements. During their second year each team has responsibility for their own physical server. This is their primary platform for lab-exercises, and teaching staff only interacts with the server in cases where there are problems. Thus, the learning activity is characterized by a high degree of independence on part of the students. Furthermore, this server is adjacent to a so-called identity area dedicated to students in this particular study program, so that students are able to interact with the equipment outside of the HEI schedule (see Figure 2). With this approach students are not bound to one strict way of providing services, but instead have the means to find their own solutions. In order to facilitate this the teaching staff in such classes typically organize sessions starting with the teacher giving a short introduction to the subject. Then the teacher spends the rest of the session collaborating with the students in their problem-solving to achieve the learning outcomes for that session. This approach to teaching has been implemented in order to cultivate social skills that are typically sought after by industry, such as teamwork and oral communication gained from collaborative project-based work methods [10].

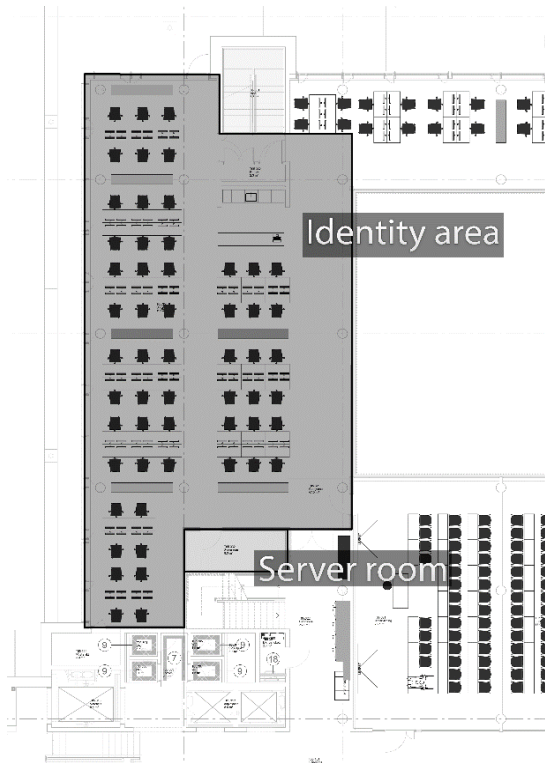


Figure 2: The identity area and the nearby server room

Individual courses are adjusted regularly, and there have also been several revisions to the study program as a whole. The latest full revision was implemented in 2012. Since then there has been a recent consolidation where the university merged with three other academic institutions. As part of the ongoing activities related to horizontal and vertical alignment of programs and courses the bachelor program will undergo a new revision. This will be founded on an evaluation initiated by the faculty, input from teaching staff, former and present students, the upcoming ACM IT2017 curriculum, along with fresh input from industry. As part of the data collection from external partners, the department hosting the study program decided to do a thorough evaluation, both to assess the quality of the teaching activities, and to ensure that future graduates are attractive among employers. This coincides with the goals of a nationally funded Centre of Excellent Education, also managed by the department, for which one of the focal areas is to investigate and improve the collaboration among educational institutions and industry.

There is no formal alumni group for this specific study program, but several of the teaching staff maintain contact with former students. This is done to gather information, e.g. through surveys, about what skills and attributes are their current employment demands. We thus know the demographics of the type of organizations that have recruited candidates in the past and are likely to do so again. There is a variety of positions taken by the candidates among various employers, but the common denominators are that all candidates are employed nationally, and the majority are concentrated in the SMB-segment[11]. We have found several former students working in roles without any

obvious relations to their former classmates, but an apparent majority are working alongside other candidates from the same study program in organizations that have IT as a part of their core business. Regarding positions the vast majority are employed in technical positions, typically as some form of IT-administrators or IT-consultants, with some having transitioned to related positions such as systems advisor, analyst or architect, and various management roles. It is also worth noting that very few candidates had opted for further academic progression, with only a handful found to have progressed to a master degree.

### III. METHOD

The interviews addressed the following overarching research question: “What makes a recruitment manager employ an IT Network Administration graduate?”. The study was designed as a “common-case” rationale in a single case, where we aim to capture the circumstances and conditions to answer this question[12].

Among the selected organizations several have their main office in the region, but only one had restricted their operations to the region, and two had no local office at the time of study. There is no known recruitment internationally from the study program, but six of the organizations have international operations. Three of those organizations also exceed the size definition of SMB, but their national office where candidates have been recruited, is consistent with this denotation (see Table 1).

Participants in the study were selected from organizations known to have repeatedly hired candidates from the chosen study program. Restricting the selection in this manner ensured that we would get informants hiring candidates on the basis of some knowledge about the education provided through the program. In order to get informants more likely to have knowledge about the labor market, field, and recruitment in general we opted for organizations of a certain size (SMB-size), leaving out one-man enterprises and small startups. From the selected organizations participants were invited among department leaders or HR-employees with the criteria that they

Type of business	Organization size	Organization location
Recruitment and consulting	1000 > (internationally)	International
IT-consulting	500-1000	International
IT-Service provider	250-500	National
Service Provider	> 100	National
IT-Services and consulting	1000 > (internationally)	International
IT-Service provider	100-250	National
IT-Software and service provider	250-500	International
IT-Service provider	250-500	International
IT-Service provider	250-500	Regional

Table 1: Overview of selected organizations

Informant #	Type of position	# of years involved in recruitment	Length of interview in minutes
1	Business Manager	6	44:20
2	Community Leader	>1	35:41
3	Section Manager	5	48:05
4	Section Manager	10	44:08
5	Team Leader	7	27:38
6	Section Manager	5	39:08
7	Business Manager	2	48:13
8	Department Manager	2	29:31
9	Knowledge Manager	16	36:39
10	Consultant Manager	10	45:55

Table 2: Informant position, recruitment experience and interview length

are decision-makers in the recruitment process. Initially 11 invitations were sent to 11 different organizations, and this resulted in a total of 10 interviews with informants from 9 of the organizations. Workforce turnover also played a part in the final composition of the group of informants, as two informants had recently found new employment, moving from one of the target organizations to another. For this reason, two informants were selected from one of the organizations, as one of the informants had extensive insights from another organization that was not otherwise represented. An overview of the informant positions and experience with candidate selection can be found in Table 2. Note that informant 6 was accompanied by a representative from HR during the interview, and the data analysis was done with input from both informants. The table only lists the Section

Manger, as this informant had the closest relation to the subject of this study.

Qualitative data was collected through individual, semi-structured interviews with the informants listed in Table 2. The interview guide was designed to make sure the questions were open and did not leave any guidelines or hint for the answers. Questions like “What is the ideal job seeker” and “What kind of knowledge, skills and personal attributes do you look for when you have a hiring process” were asked, and to encourage more elaborate response, the interviewees were asked to reflect on their answers.

The interview guide was approved by all three authors. The interviews were conducted by the main author to ensure consistency in the way the questions were asked.

To analyze the findings two of the authors and a research assistant read all interviews and coded four of them together to establish intercoder reliability. The rest of the interviews were coded separately but with overlap, so that each interview was coded by two people separately and their coding subsequently compared. Since the codes emerged from the material, the process was iterative, going from text-based coding to categories[13].

#### IV. RESULTS

During the interviews, the informants mentioned many different characteristics that they looked for when hiring a candidate. Due to the semi-structured format and open-ended questions there is a wide variety in the characteristics mentioned. An overview of the characteristics that were referred to by the informants is presented in table 3. We have sorted the characteristics in descending order based on how many of the informants mentioned them, see column “#informants”. To improve readability the characteristics are organized according to the definition of employability by dividing them into Skills, Achievements, Understandings and Personal Attributes[6].

A categorization of which informant has mentioned what aspect, and the number indicates how many times each

		Informant 1	Informant 2	Informant 3	Informant 4	Informant 5	Informant 6	Informant 7	Informant 8	Informant 9	Informant 10	#informants
	Interest in the field	17	5	4	1	5	1	13	9	1	1	10
Understandings	Organizational understanding	6	2	3	10	2	3	6	1	11	3	10
Skills	Oral Communication Skill	5	2	8	2	3	2	6		5	1	9
Achievements	CV/diploma	8		1	1	1	2	5	1	1	2	9
Personal attributes	Reliable, Responsible	1	5	1	4	3	2	2		3		8
Skills	Teamwork	2	2	6	7			2	2	1	5	8
Personal attributes	Outgoing	1	3	4	2	1	1			1	1	8
Skills	Lifelong Learner		3	3	8	1	3		2	2		7
	Scripting /powershell		4	2		1		3	1	1	1	7
	Problem-Solver			1	4		1	4	1			6
Personal attributes	Self-driven	2	1			1	2	2	2			6
	Attitudes			1	6	1	1	2		3		6
	Sociable	2	1	1					3	2		5
	Shows initiative						3	2	2	1	1	5
Skills	Curious	1		1			2	2			3	5
	Cloud services	3	2	1				1	1			5
Personal attributes	Virtualization	3	1	1		1			1			5
	Flexible		1	1			3	1				4
Skills	Consultant		3	1		2		2				4
	Azure	1						1	2		1	4
Skills	Linux	2	1			1			1			4
	Written Communication Skill				3			6		4		3
Personal attributes	Structured			1		2				1		3
Achievements	Bachelor thesis					1	1				1	3
Skills	ITIL			1	1					3		3

Table 3: Overview of which informant has mention which characteristic, and number of times they mention each. Sorted by how many informants that spoke of each characteristic. Categorized by the definition made by [6].

informant has mentioned the aspect (see Table 3). To be counted as “mentioned”, the word/phrase had to be mentioned explicitly by the interviewee, or he/she used a synonym.

When we summarized the aspects in this manner we found an apparent consensus among all informants on two aspects that are emphasized during the employment process, namely “Interest in the field” and “Organizational understanding”.

As can be seen in the leftmost column in Table 3 the aspect “Interest in the field” has not been assigned to any of the four aspects of the employability definition. The informants referred to this as an underlying aspect that could enhance and validate other aspects and provided a platform for good workplace performances. One of the informants explained how this characterizes the preferred candidates:

Informant 3: *“The very best, you know, are those that have IT as both a job and a hobby. Those that sit at the dorm, or wherever, being inquisitive and exploring... making stuff on their own. Those are the very best, those who have that burning interest that we are always in demand for. Then there are those that treat it like a job and do their job before they put it away and go home. That’s okay, as long as they do a good job. But they will never be as good as those that have IT as a hobby”.*

How this aspect can go beyond the curricular activities is illustrated in the following quotation:

Informant 7: *“Some have learned in school, and we see that we prefer to hire those that sit down and... that they have tested and tried and played around. To get a deeper understanding, more than a few hours per week during a semester before the exams and then be done with it. [...] There are several of those things that you need to have, you need to have tried it for yourself.”*

Another example of the importance of this aspect and how it is perceived to improve workplace performance is this quotation from one of the informants:

Informant 8: *“Having something as a hobby, it could be just something small, but it’s so important that you are interested, because I think you will automatically be good [at your work] and enjoy your work. It’s so important. And we have noticed that the students from here [referring to the program] have this interest. They are sitting at home, tinkering [with technology] ... they might have done it before the studies as well, it’s in their blood. And it... it’s important, because, if you have it [the interest], you are going to be very good, and work hard, do a good job and you will enjoy it. That’s what we are looking for”.*

The other aspect mentioned by all informants was “organizational understanding”, which referred to both the ability to perform alongside others and understanding their role in how to achieve organizational objectives. This is illustrated in the following quotation:

Informant 4: *“[...] in today’s labor market, [...] you have to work more and more interdisciplinarily, and you have to understand companies, and to get this understanding you have to be able to talk with many groups, not only engineers, and people have to think it’s all right to work with you. It’s not so important how you do it, but you have to see yourself as part of a community.”*

Closely related to the ability to perform alongside others is “oral communication skills”, that was mentioned by all but one of the informants. Several of them emphasized how important it is to relay expertise appropriately and understandably to clients and colleagues. This was mentioned in the previous quotation, and another informant likened not having communication skills to not having knowledge, exemplified in the following quotation:

Informant 3: *“if you freeze up and become insecure even if you know the answer (...), and you are unable to convey it, then that’s as big a problem as if you don’t have any knowledge”.*

Communication skill was also mentioned as a means to express enthusiasm and pass this on to clients as displayed in this situation:

Informant 5: *“You can tell if people are engaged! [If they] are selling and capable of conveying information about the technology that we are in fact selling and implementing, and are capable to talk to both management and the IT-department, users, in a good way.”*

With one exception all informants mentioned academic and professional achievements, i.e. CV/Diploma, as an important attribute. The significance placed on top grades, however, was not consistent among the informants. Several of the informants mentioned such achievements as requirements to get interviewed, but good grades did not necessarily translate to being the preferred candidate, as this quotation illustrates:

Informant 1: *“If you have got an C in average and like to tinker [with technology] in your spare time, that might be better than having a B in average, and don’t tinker in your spare time.”*

“Reliable and responsible” were the most desired personal attributes among the informants. The importance of these attributes appears to be related to the reliance on IT-systems in modern organizations, as mentioned in this quotation:

Informant 4: *“If your employment is based on systems that need to be available all year you don’t want a colleague that might bail on you when things heat up.”*

The previous quotation also indicates the importance of function alongside your co-workers, which is related to the “Teamwork” skill. The same informant expanded upon this in the following quotation:

Informant 4: *“You can be extremely good technically, but if you aren’t a team player ... [...] it does not matter. What the school has done, making the students work together in projects and actually helping each other, is an important issue in one’s further working life, I think. You don’t need fantastic top achievers, you will need people that are very good at working together, especially since things get more and more complex and we all make mistakes.”*

Among the remaining attributes the perhaps most unexpected finding was that only three informants explicitly mentioned “Written communication skill”, which is only one third of those that mentioned “Oral communication skill”.

Considering the overall findings from the interviews, we find that the employers of the IT network administration candidates

look for personal characteristics consistent with what has been found in the research literature on employability, as addressed in the Background chapter. What is particularly noteworthy about our study is how the employers stress *interest in the field* as a key characteristic of attractive candidates, and how the employers link this to students' engagement in extra-curricular activity.

In the discussion chapter, we will go into some more detail on the connection between curricular activity, extra-curricular activity and students' interest in the field. We will elaborate on how they can be supported in order to strengthen students' employability, considering the present organization of the IT network administration study program and what can be learnt from it.

A. An extended model

Based on the results outlined in the previous chapter, we made an extension to the model in Figure 1, including students' interest in the field as a separate entity in the model and suggesting that extra-curricular activity play a role not only by contributing to employability, but by validating the employability provided through curricular activity. The model is presented in Figure 3. We will explain the model in what follows.

The graduate is the person of interest, it is him/her that needs to be employed and has a level of employability. The graduate can develop employability through four different aspects: Personal attributes, achievements, skills and understanding. On these aspects, we have employers' viewpoints as explored in our interviews.

1. Personal attributes: The results of our study indicated that these attributes are seen as static by the recruitment managers. They think that what they hire is what they get, and that they cannot change the personal attributes of the graduates. The recruitment managers argue that it is easier to change the graduates' knowledge than their personal attributes, and some argue that they would rather hire a graduate with poor technical skills than a graduate with personal attributes that do not fit the company. Overall, it seems that some characteristics considered by the HEI to be skills that can be acquired and improved (e.g. being structured) are considered as inherent, unchangeable personality traits by some employers.
2. Achievements: According to the informants it is important to have good grades and a diploma when applying for a job. The grades determine whether the graduate gets the opportunity for an interview by the company. The diploma is an overview of what the graduate should have knowledge about, and the grades should indicate how well the graduate have the knowledge / skill / understanding.
3. Skills: Skills are knowledge that you apply to solve a problem or task. This includes technical skills e.g. in programming and system administration, and it also

includes soft skills frequently mentioned by the informants in our study, e.g. teamwork and oral communication skills. The HEI aims to develop such skills through project work, which requires the students to learn how to handle deadlines and how to work in teams together with their classmates.

4. Understanding: According to the informants it is important to have organizational understanding. This implies understanding where in the work chain you belong, how it works, that you have the ability to talk to both engineers, other colleagues, and customers with no technical background. You need to comprehend what your job is, and what it is not, so that you don't create additional work for others because you worked outside of your scope and ruined something.

To become more employable the graduate can choose to participate in the curricular activities provided by the HEI. These activities are seen as employability development opportunities for the graduate [9] and include lectures, teamwork, assignments, and other types of learning activities in the course in which the graduate participates. Additionally, the graduate can participate in extracurricular activities which also may contribute to employability.

If the graduate has the interest in the field that so many of the recruitment managers ask for, this makes the graduate more likely to participate in extra-curricular activities including the use of technology they want to explore and master. There may or may not be a connection to what the students learn as part of the curriculum of the study program. As such, these activities represent a way to learn something new but also to deepen the

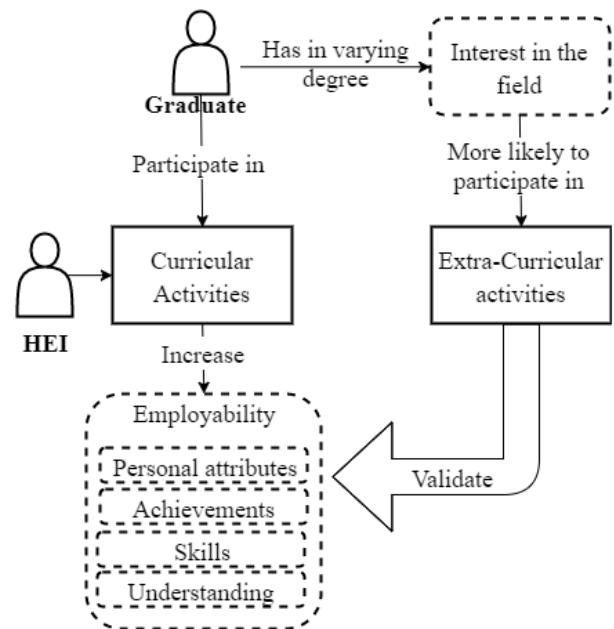


Figure 3: Extended model where interest and validation are shown

knowledge of technology learned through curricular activities. Extra-curricular activities take place in the students' free time independently of demands from the HEI, and might include the following main areas, which were all referred to by the informants in our interviews:

1. **Projects:** Students may create and/or manage their own projects, for instance managing a smart house
2. **Make own things:** Students may program various devices to fit their own needs. For instance, students buy Raspberry Pi's or create their own webpages.
3. **Staying updated:** Students who are interested in the field also tend to stay updated when it comes to new technologies, developments and trends in the market. This typically involves active participation on social media like LinkedIn and Twitter.
4. **Summer jobs:** Students get experiences from summer jobs, or they do have a part time job while they study. It seems that graduates that wants to learn more, use their knowledge or explore work-opportunities have these jobs.

These extra-curricular activities make the student apply the knowledge and skills acquired through activities in the HEI, and validating employability with respect to personal attributes, achievements, skills and understanding.

We also note that the recruitment managers ask for a number of characteristics that they do not explicitly link to extra-curricular (or curricular) activity. This includes organizational understanding, oral and written communication, having a good CV/diploma, showing teamwork abilities, being a lifelong learner, a problem solver and having technical skills e.g. with scripting, cloud services, virtualization and specific tools like Azure and Linux.

## V. DISCUSSION

As the result showed, it is important to both look at the curricular and extra-curricular activities to understand how employability can be gained and validated. The discussion will look into what the higher education institution can do to support these activities. It will also provide some implications on how curricular and extra-curricular activities can increase employability together.

The popularity of the IT network administration study program in the labor market can be taken to indicate that the graduates from this specialization have high employability. According to a survey about employment (the 'Candidate survey') regularly conducted by the HEI, the IT network administration graduates get jobs easily and quickly. As explained by the informants in the study– the employers are satisfied with graduates they have hired from this specialization, and therefore continue to hire candidates from the study program

Taken from these indicators, it might be a good idea to look more closely into what the HEI provides to the graduates: what employability development opportunities are provided, and what aspects of employability are affected.

As shown in Figure 1 and argued e.g. in [9], HEI provides the graduate with opportunities to develop their employability, but employability also develops outside of the curricular activities. We argue that in the case of the study program in IT network administration addressed in this paper, the HEI provides employability development opportunities *both* in curricular and extra-curricular activities, by creating a space for the latter and good synergies between the curricular and the extra-curricular.

### A. HEI support for curricular activities

In terms of curricular activities, the HEI provides support in the following main areas: teaching activities, collaboration with others, assignments and bachelor thesis.

Teaching activities: At the IT Network Administration study program there are intro lectures to the technologies, after which the students are told to work without the teacher to get hands-on experiences with the technology. The teaching activities are made to engage students, e.g. introducing them to LEGO-robotics, or drones, or while lecturing about security; get presented for password protectors for PC and mobile which the students often adopt themselves. Frequent updates to the curriculum is necessary in order to keep up with rapidly changing technology. This is emphasized to the students, and they are encouraged to examine several platforms and solutions to be prepared for future transformations. By giving them access to highly flexible and available platforms for observing and exploring changes in technology the HEI aims to foster an interest in staying updated within the field, which is an important aspect for the recruitment managers.

As for today, the IT Network Administration study program does not include a practice period. Other disciplines (like healthcare education) include practice out in the field, for the students to get familiar with the way of work, to apply their knowledge into practice, and to get organizational understanding. This might be a possible direction for the IT-educations as well. Having a practice period might give the students more interest in the field, more motivation to work hard with their assignments, and increase the employability of the students even more.

Collaboration with others: The HEI provides the graduate with several courses which involve teamwork. The students formulate and sign a contract which makes them accountable to the others in the team. How the team is going to work together to reach the goal or deadline is defined by the team itself. The teamwork fosters increased focus on social skills, and includes negotiation and problem-solving. Furthermore, it demands that the team has structure, and teaches them how they should work together to reach the deadlines and goals necessary to pass the course. On several occasions the teamwork ends in presentations for the whole class, and in this way trains the graduates in speaking to a larger audience.

Assignments: Graduates at the HEI get introduced to new technologies and tools. Typically, students are presented with one way to achieve the desired outcomes during the curricular activities, but are provided with resources to find their own way during the assignments. During this process the academic staff take the role of a collaborator rather than instructor, and try to

give hints in order to help students achieve the desired learning outcomes through their own effort. This way of working pushes the teams to find the answer to their questions themselves, preparing them for work life, when help might not always be available.

Bachelor thesis: In this case the students get to work with organizations when they write their bachelor thesis. Here the student is located at the company and work with them. This creates a more realistic setting for the students, and helps them develop an organizational understanding. Getting experience in a realistic work environment is an easy way to increase the employability for the student.

#### *B. HEI support for extra-curricular activities*

In terms of extra-curricular activities, the HEI provides support in the following main areas: identity area, access to technology and work in student organizations.

Identity area: Teaching activities are heavily reliant on students working on assigned tasks, and to facilitate this the students have their own allocated area, referred to as their “identity area”. There each group can have their own dedicated seats to conduct co-located work on school assignments. In the identity-area there is also interaction between second and third year students, where they exchange experiences from both curricular and extra-curricular activities. The area is not assigned to students according to a schedule, but can be used freely throughout the day for any such activities. As a consequence, this area is also an arena for discussing personal side-projects related to the field. It is possible that the “identity area” can make the graduates feel part of a community, and might help them to get an understanding of how a professional community works.

Access to technology: A central element of IT-education is to provide resources where graduates can gain and expand their technological skills. This is, in large part, done with agreements that allow students to use resources such as cloud platforms and software. On campus the majority of the lab-exercises are based around a virtualization platform designed as a “private cloud” where students in this study program typically have access comparable to “Infrastructure as a Service”, but there are also other service models and other platforms from external providers. As previously mentioned, students in their second year are working in groups that are responsible for their own physical server, and have the freedom to configure this in the way they consider best suited to solve the assigned tasks. As illustrated by Figure 2, students have an easy access to the server room from their identity area. With each group having their own isolated domain there are few constraints on when they are able to tinker with this platform, and both problem-solving and fine-tuning outside of curricular activities are both possible and encouraged. This is further enhanced by introducing the students to various operating systems and software tools, both freeware and solutions available through the HEI from partnerships and agreements.

Student organizations: On campus there is an active student organization that has a group of dedicated IT-operators providing several services to their members as well as other local non-IT student organizations. Several members of this group have come from IT Network Administration study program, and

this provides the students with a great opportunity to apply skills and methods from the curricular activities. This also gives insight in organizational understanding and enhanced skills such as teamwork and oral communication. The student organization has chosen to be visible in the identity area, providing free coffee for students there. Their members are frequently present in the area and often take an interest in ongoing activities providing insight and sharing their experiences.

#### *C. Contributions*

In this discussion we have elaborated on how the HEI supports curricular and extra-curricular activity likely to strengthen employability, with reference to the model in Figure 3. The model points to the connection between curricular and extra-curricular activity, and we have argued about how they are connected in practice in the study program of our case. The teaching staff at the university believed that collaboration with external businesses and a focus on student active learning methods was the reason for the high employment rate, but according to the findings there are also other reasons why their students are so popular. For instance, the HEI provides the students with identity areas and technology (such as dedicated servers) available for experimenting also outside school hours, and encouraging participation in student organizations, which both is believed to foster interest in the field.

Through a strong focus on student-active and practical approaches to learning, the students get work related knowledge. As previously stated, graduates from IT Network Administration study program get job easily, and only a few candidates opt for further academic progression. The graduate (see Figure 3) is highly attractive for employment, have good practical knowledge, and eager to start working and earn money.

We see two main contributions from this work.

Firstly, we have presented insights about how a higher education institution can support curricular as well as extra-curricular activities, helping students improve their employability through both types of activities. The case explored in our study is a bachelor program with a technical and rather practical orientation, which means the relevance of the approaches might be highest for study programs sharing these characteristics.

Secondly, we have built on existing research and our empirical findings to conceptualize a model highlighting the role of interest in the field as a characteristic impacting on employability. The model was used as a conceptual tool framing our discussion, and may be developed through further research.

## VI. CONCLUSION AND FURTHER WORK

The focus of this paper was the employability of graduates and how a higher education institution can provide support for the development of employability. We referred to the existing research literature to argue about the importance of considering both curricular and extra-curricular activities as sources of employability. Our study explored employers’ perspective on employability through interviews with recruitment managers in organizations that employ graduates from a particular IT network administration study program. The graduates of this program are perceived as generally having a high degree of



employability, taken from the ease with which they get a job after graduating.

Our interviews showed what particular characteristics are sought after among employers, our findings largely corroborating those of other studies on employability but pointing in particular to the significance of students' interest in the field. The employers in our study assumed that a high interest in the field leads students to engage in extra-curricular activities which require the use of, and thus can be seen to validate, knowledge and skills which the HEI aims to develop through curricular activity.

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