Getting a Relevant Summer Job in IT

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ABSTRACT: It is important for students in study programs in information technology (IT) to get a relevant summer job. We conducted a study to investigate whether and when they get such jobs and whether this is correlated with certain characteristics of the students. For instance, is there a gender difference? Is there a correlation to grades? What about students' involvement with IT through side projects, through teaching assistant jobs and through other, non-relevant types of work? To investigate this, data was collected by use of a survey answered by approximately 400 IT students at NTNU. Overall results indicate that the students do get relevant summer jobs, and most of them have gotten the first one after their 3rd year as IT students. The possible impact of gender, grades and various forms of prior experience is briefly discussed.

1 INTRODUCTION

Summer jobs are considered essential in providing students with work experience, giving opportunities to apply knowledge and skills from university courses in an authentic setting (Binder et al. 2015). By *summer job* we refer to paid employment in a company in the summer months, typically with a duration of 6-8 weeks. Work experience is one way of enhancing graduates' employability (Knight and Yorke 2093). This happens not only by helping the students develop skills of relevance to industry, but also by helping the students develop a pre-professional identity through participation in a relevant professional community (Jackson 2016). Furthermore, summer jobs are an important arena for recruitment into regular jobs after graduation, providing employers with an opportunity to assess the candidates' competence over a certain period of time.

Employability is in one sense case-specific (depending on the type of job, state of the job market, characteristics of the job seeker etc.), but general patterns can be seen. Among the factors associated with the likelihood of getting a job in IT are gender (Morley 2001) and engagement in side projects in IT. The latter has been cited by employers as important demonstrating candidates' personal interest in the field (Lundberg et al. 2018).

One overarching question is whether the students get relevant summer jobs as needed for their education. To investigate this, we may focus on the study year when we would expect the students to *be able to* get a relevant job. In our case we consider this to be the third year, based on the degree of in-depth IT knowledge and skills that has been achieved by then. (This could be discussed in more depth, but we will not do so in this paper). Also, it is relevant to look into how the students meet the *formal requirements* for work practice required in some study programmes before the final master thesis can be submitted. These requirements are intended to ensure that the candidates get some insight about work practice for ordinary employees in an organization. In our case, one of the two master programmes (a 5 year integrated programme) taken by students in our population requires 12 weeks of such work practice, of which 6 weeks need to be IT-related and 6 weeks may be non-related. The other master programme (which is 2 years based on a 3 year bachelor degree) requires 6 weeks altogether, 3 of which must be relevant.

A large part of the student population has some kind of paid work that is not IT-related, which possibly affects their employability. Moreover, engagement in unpaid, IT-related side projects could be an important part of getting hands-on experience with the technologies used in the industry, and if done properly, may also result in something concrete to showcase for a potential employer in an interview setting. Personal interest in IT as demonstrated in side projects is valued by employers of IT candidates (Lundberg et al. 2018). Thus, considering whether and when the students get summer jobs, it is interesting to consider the correlation with different types of experience: Side projects, work as teaching assistant, and non-IT-relevant jobs.

We pose the following research questions: RQ1: Do the IT students get a summer job (and when)? RQ2: Are there gender differences with regard to getting a summer job? RQ3: How do grades

correlate with getting a summer job? RQ4: How does previous experience correlate with getting a summer job?

2 METHOD

The study is part of a research effort to explore and identify challenges to, and ways of improving, the employability of IT students.

The data for the study was collected by use of a survey that was distributed to students at the Department of Computer Science (IDI) at NTNU in Trondheim in May 2018. All students registered in year 1-4 were asked to complete an anonymous survey whose goal was to investigate which factors might influence IT students' ability to get a relevant summer job. Of the 418 respondents, 336 completed the survey. This makes up ~14% of the target population. The survey was created using an NTNU owned instance of SelectSurvey. All data were stored at servers owned by NTNU.

As the survey was answered in May, it includes answers pertaining to work contracts for summer jobs the following summer. Contracts are typically signed in the autumn the year before. This means we can derive with reasonable accuracy how many students in year X had a summer job after year X.

To be able to answer the research questions, we introduce the following metrics:

JOB3 considers the students currently in their their 4th year, seeing what percentage of this group had secured a relevant summer job in their 3rd year or earlier. We exclude 3rd year students, as some of them are about to complete 3 year bachelor and go into full-time jobs, and the data does not include information about which 3rd year students will proceed with a 4th and 5th year.

To find out whether the students are getting the necessary work practice in accordance with the formal requirements, we can ask 4th year students, finding out how many year 4 students have (ever) secured a relevant summer job. We denote this JOB4.

If we want to investigate the correlation between getting a relevant summer job and various other variables, we can consider the whole student population of year 1-4, ignoring the issue of when the job was secured. The percentage of students who have at some point signed a contract for a relevant summer job we denote JOBALL.

The question of WHEN students get jobs can be addressed by considering the students in all years (1-4) who have had/signed for a summer job, seeing in what year their first summer job was acquired (FIRSTJOB). This measure fails to capture when – in the future - many of the currently early year students will get their first summer job, which means the overall numbers are skewed, giving more weight to data about the current 3rd and 4th year students. However, given a stable job market and few changes to the study programs over the last years, we can use FIRSTJOB as a reasonably accurate one-point measure of when our current students get jobs, allowing for comparison across years and for correlating with other parameters.

The grades of the respondents are self-reported. We asked them to enter their mean grade point score on a scale from 1 to 5 and rounded up to the nearest half. In our experience as university staff, students know their grade average, and there is little reason to be dishonest about it in an anonymous survey.

To find out about the number of side projects, we asked: "How many IT projects outside the study program, e.g. through volunteer work <norsk: "frivillige verv"> or your own initiative, have you been working with? It might be anything within IT, but the amount of work must have been at least three days." The answer options were 0, 1-3, 4-6, 7-9 and >10 side projects.

3 RESULTS

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Of the 336 respondents that completed the survey, 58.3% (N = 196) reported that they at some point during their time at NTNU had signed a contract for a relevant summer job. Since the survey was distributed during the spring semester, this figure also includes those who had signed a contract for the forthcoming summer, but not yet completed the actual internship. Of those who had signed a contract, there were 155 men and 41 women. This aligns with the overall difference between all the respondents, as 21.7% were female (N = 73) and 75.9% were male (N = 255). The percentage of

female respondents was somewhat higher in this study compared to the general student population at IDI, in which girls make up 16% (Lorås et al. 2018).

RQ1: Do the IT Students Get a Summer Job (And When)?

Overall, we found that 87% of students who are currently in their 4th year had signed contract for a relevant summer job (JOB3=87). 64% of students currently in their year 4t had secured a relevant summer job in their 3rd year or earlier. (JOB4 = 64).

RQ2: Are there Gender Differences with regard to Getting a Summer Job?

A Pearson correlation test showed no significant correlation between gender and whether or not the students had ever signed a contract (JOBALL) (r = .038, sig = .4864). There is some connection between gender and when the student gets their first relevant job (FIRSTJOB). Among our respondents, those who got a job already after their 1st year were all male; see *Fig.1*.

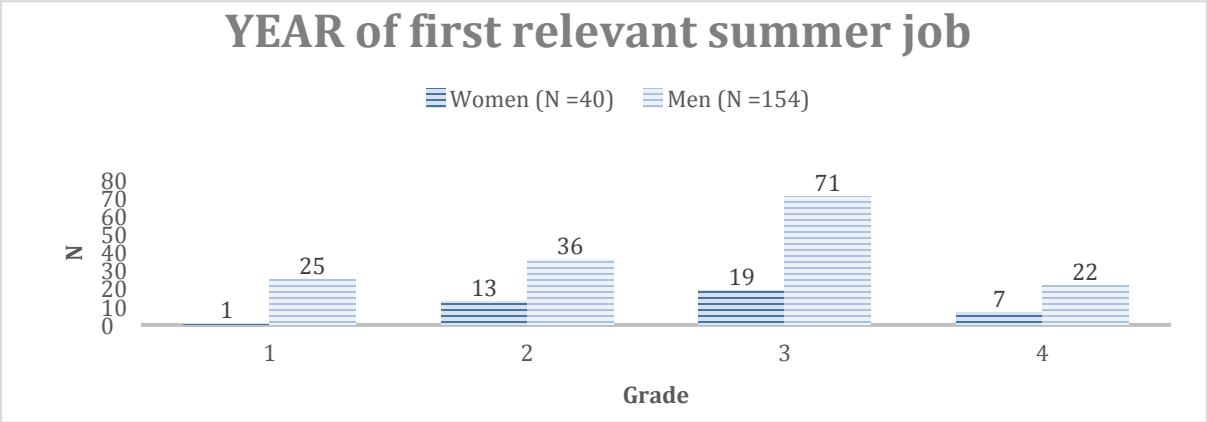

Fig.1. Year of first relevant summer job vs. gender

3.1 RQ3: How Do Grades Correlate with Getting a Summer Job?

The mean overall grade reported by the respondents was 3.63 (N = 290). Statistical analysis shows a weak correlation between higher grade scores and whether or not the student had signed a contract (JOBALL) (r = .2953, sig = 0.00). There was also a weak correlation between average grade score and how early in their time at NTNU the IT-students got their first relevant summer job (JOBFIRST) (r = .257, sig = 0.00).

Checking for a possible correlation between gender and average grade score, we found a weak correlation (r = .264, sig = 0.00): the female students have somewhat better grades.

3.2 RQ4: How Does Previous Experience Correlate with Getting a Summer Job?

The distribution of answers about the number of side projects with respect to gender is shown below. The data includes all the students (year 1-4).

There was a weak correlation between the number of side projects and whether or not the student had gotten a relevant summer job while studying at NTNU (JOBALL) (r = .2720, sig = 0.00).

The diagram in *Fig.2* shows the difference between male and female students with regard to side projects. It is clear from the diagram that the male students generally have engaged in far more side projects than their female peers.

Also, having had a job as teaching assistant (Norwegian: Undervisningsassistent/studentassistent) is weakly correlated (r=.35, p=0.000) with having secured a summer job (JOBALL).

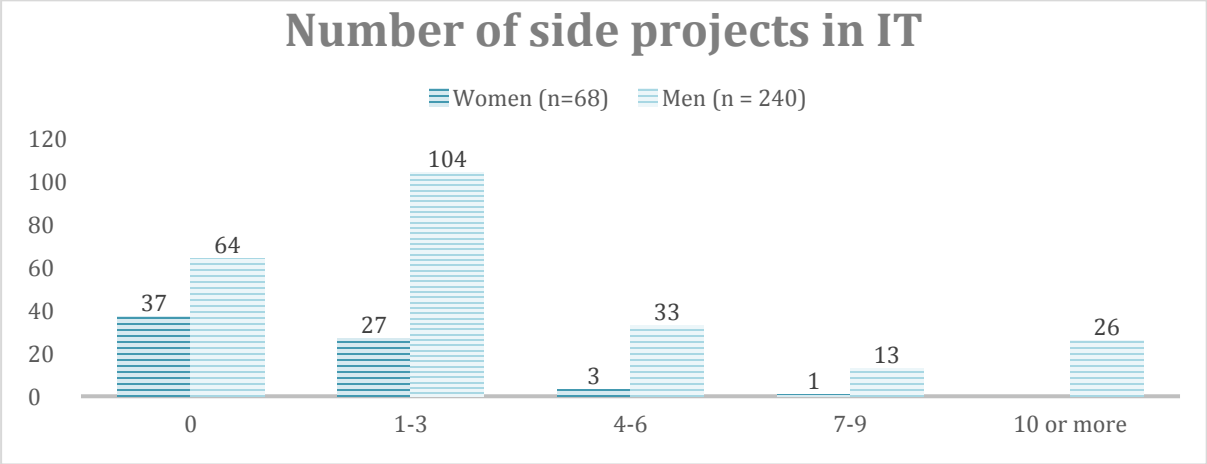

Fig.2. Number of side projects vs. gender

Having had a job as a teaching assistant is only marginally correlated (r=.15) with the number of side projects.

Interestingly, we see a weak correlation between the number of side projects and how early the students signed a job (JOBFIRST) (p=-0.243, sig=0.0004). In other words, the more side projects, the earlier the student gets a job.

Our data showed no correlation between the degree to which a student had ever had any job and the likelihood that the student had secured a relevant summer job (JOBALL).

4 DISCUSSION

Overall, the study confirmed the picture that is currently prevalent among students, university staff and employers in the area of Information Technology: Our students are attractive in the job market, also for summer jobs, and generally manage to get the desired relevant work practice during the course of their studies. This is certainly influenced by the current state of the job market for our candidates, but it also indicates that the competence of our candidates is considered relevant by employers. Factors impacting on the likelihood of getting a summer job is still interesting, and will be even more relevant should the job market change.

In our study we found that both side/hobby projects and teaching assistant jobs are positively correlated with getting a summer job earlier. With caution, we might see this as a sign that engaging in either of these activities can be a way of increasing one's possibilities in the summer job market.

Our study showed clearly that female students generally engage less in IT side projects (as defined in our survey) than their male peers. Engagement in relevant side projects correlates with getting your first relevant summer job early on. As seen in Figure 1, the ones to get a summer job after their first year are generally male. These findings paint a coherent picture, indicating that there is a part of the male IT student population who enter their studies with existing experience from side projects (and/or engage in such projects during their year 1) and thereby increase their chance of getting a summer job already after year 1.

At the same time, we see that males and females get summer jobs to the same extent if we consider the entire 4 year period (year 1-4). This points to other factors than side projects making female candidates equally attractive. Grades might be one of these factors, as we found a correlation between grades and having signed a work contract, and also found that female students have slightly higher grades than male students. There may of course be other factors that amount to a gender difference with respect to employability and that we have not captured in our survey.

Seeing the correlations in the data (while being aware that correlation is not the same as causality), it seems that taking on roles and tasks that are paid and relevant work in the university context (teaching assistant jobs) or roles and tasks linked to relevant side/hobby projects are both linked to increased chances of getting a summer job. The latter supports the findings in (Lundberg et al. 2018) about the importance for employability of personal engagement in IT-related tasks. The marginal correlation between being a teaching assistant and the number of side projects can be taken to imply that there is

little overlap between the group of students who work as student assistants and those who engage in such projects.

Having had a paid, non-relevant job was not correlated with having signed a contract for a relevant summer job. This means that in the general case, working at the local grocery store or sports outlet, while being useful sources of income, might not necessarily increase the likelihood of getting a relevant summer job. We approach this finding with caution, being aware that employability for a summer job, as with employability for a regular job after completion of the study program, depends on a number of factors specific to each case. In some situations, work experience from other fields than IT might demonstrate to an employer that the candidate is likely to have valuable competence or personal traits. It is possible that general work experience is less important for getting a summer job than it is for getting a regular job, but this cannot be concluded from our data.

A limitation to our study is that we do not know the difference between the part of the population who answered our survey and those who did not. There might be some bias, i.e. if students who have already signed a contract for a summer job were more (or less) prone to answer our survey. Another source of error in our study is that some of the respondents who lacked a job at the point of answering the survey might have secured one very late, close to the summer holiday. We think this applies to a very small number of students, thus having little impact on our results.

For those who would like to conduct a survey similar to the one we used in this study, we strongly recommend conducting it at the end of the school year. This means the data will cover most of the signed work contracts for the following summer, which can then be captured in key metrics (like JOB3 and JOB4). Another good thing about the end of the school year is that students are likely to see the answering of the survey as a nice break from exam preparation! Further work on our part includes repeating the survey in the years to come, to see the development of employability with regard to summer jobs over time. Also, we will use insights from the present study in the continued research on employability in IT education, exploring the possibilities for helping students increase the likelihood of getting a relevant summer job when they need it.

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REFERENCES

Binder, J.F., Baguely, T., Crook, C. and Miller, F.(2015): ”The Academic Value of Internships: Benefits across Disciplines and Student Backgrounds”. *Contemporary Educational Psychology* 41 pp 73-82.

Jackson, D. (2016): ”Re-Conceptualising Graduate Employability: The Importance of Pre-Professional Identity.” *Higher Education Research & Development* 35 (5) pp 925-939

Knight, P. T. and Yorke, M. (2003): ”Employability and Good Learning in Higher Education.” *Teaching in Higher Education* 8(1)

Lorås, M., Sindre, G. and Aalberg, T. (2018): ”First Year Computer Science Education in Norway”. UDIT 2018. Proceedings of Norsk konferanse for organisasjoners bruk av IT (NOKOBIT), Bibsys

Lundberg, G. M., Gaustad, A. and Krogstie, B. (2018): ”The Employer Perspective on Employability”. Educon 2018, Tenerife, Spain. IEEE

Morley, L. (2001): ”Producing New Workers: Quality, Equality and Employability in Higher Education”. *Quality in Higher Education* 7(2)