

PERCEIVED EMPLOYABILITY IN ONLINE IT EDUCATION

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Abstract. *In this paper, we use an online bachelor study program in IT as a case for research on Perceived Employability (PE). Collecting data from alumni through interviews and a survey we find an increase in students' PE during their bachelor education. We also find a difference between students who had relevant work experience before their studies and those without such experience, the former having higher PE before their education. This gap decreases and is not significant after completion of the bachelor program, except for the aspect of Contact Network. We discuss the results in light of how PE can be used as a construct in the evaluation and development of the specific bachelor program of our study and other study programs. We suggest that PE can be used to measure some important aspects of a study program, but as part of an overall evaluation, it should be combined with questions about competence and satisfaction.*

Keywords: Perceived Employability, Online education, Undergraduate

1 INTRODUCTION

An important aspect of online education is that students often are more diverse than traditional campus students. Online students are typically older, study with different progression, and often maintain other responsibilities such as employment, family, or financial commitments (Ely, 1997). Over half of online students in Australia work full-time while studying, and 26% work part-time (Anderson & Zawacki-Richter, 2014). Due to this diversity, a study program might have a problem facilitating the education to be relevant for all student groups and making students employable. In this paper, we use an online study program in Norway as a case to look more into this problem.

Employability is a term used to define what a student should possess in terms 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” (Yorke, 2006). The term employability can, as this definition shows, be used on three different levels (Thijssen, Van der Heijden, & Rocco, 2008): The macro-level considers employability from the perspective of the whole society/country (e.g. McQuaid & Lindsay (2005)). The meso-level comprises the employer perspective (e.g., as measured by the work readiness scale (Caballero & Walker, 2010)) and the higher education perspective (e.g., by Generic Skills Assessment (Hambur, Rowe, & Le, 2002)). Finally, the individual level considers employability as viewed by the graduate (e.g. Fugate, Kinicki & Ashforth (2004)).

According to Vanhercke, DeCuyper, Peeters & De Witte (2014), there are three approaches to employability. The first approach is to mainly consider competence, where an individual needs to have the competencies that are sought-after in the employment market. The second approach is dispositions which are about how proactive an individual is towards employers or a career (Vanhercke et al., 2014). Whereas both competence and dispositions influence a person's chances on the job market, research has found that it is more important for employability to focus on, and increase job-related skills and knowledge, than it is to stress dispositions, e.g., by improving job search strategies. Specifically, this is the case when job-related skills and knowledge are weak (Wittekind, Raeder, & Grote, 2009). The third approach to employability is perceived employability (PE) which concerns the subjective consideration of employability, and the possibilities for employment an individual have (Berntson & Marklund, 2007; Vanhercke et al., 2014).

PE is important for applying for and maintaining a job. PE affects an employee's perception of their job performance, a high degree of PE making it more likely that an employee believes they perform well. Also, a high degree of PE is associated with lower levels of job exhaustion and psychological issues. In general, PE is important for employees' well-being (Berntson & Marklund, 2007; Kinnunen, Mäkikangas, Mauno, Siponen, & Nätti, 2011).

PE can be gauged by having the individual rate themselves with respect to a set of statements (Vanhercke et al., 2014) reflecting five different aspects of PE (see table 1).

Table 1. *The five aspects of Perceived Employability (PE)*

<ol style="list-style-type: none"> 1. My competence is sought-after in the labor market 2. I have a contact network that I can use to get a new (equivalent or better) job 3. I know of other organizations/companies where I could get work 4. My personal qualities make it easy for me to get a new (equivalent or better) job in a different company/organization 5. My experience is in demand in the labor market.

A concept related to PE is self-efficacy: A person's belief in their ability to succeed (Bandura, 1994). Self-efficacy has an impact on a person's ability to cope with challenges in work-life (Stajkovic & Luthans, 1998) and can be measured by the use of questionnaires. Berntson, Näswall & Sverke (2008) conducted an empirical study to find the relationship between self-efficacy and employability. They measured the latter by using the five statements proposed by (Vanhercke et al., 2014) for gauging PE, along with a sixth statement: "I could without problems get an equivalent job in another company/organization". The study showed that employability and self-efficacy are distinct but related concepts and that employability predicts self-efficacy, leading to the conclusion that strengthening employability may lead to stronger self-efficacy. Another reason to apply PE as a theoretical construct, as well as a basis for the empirical investigation, is that compared to a view of employability that considers competence or dispositions, PE has a stronger focus on contextual factors (Vanhercke et al., 2014). In the case of graduates in online education, for instance, PE is a perspective that can help us capture how the students, many of whom have extensive work experience, see themselves with respect to a job market with which many are already familiar.

A study program can influence PE by supporting students' attainment of learning objectives and by providing opportunities for acquiring knowledge and skills beyond these objectives, as intended in Constructive Alignment (Biggs & Tang, 2011). Universities should, therefore, provide students "*with a combination of academic knowledge, personality, and behavioral development and the development of soft skills*" (Matsouka & Mihail, 2016).

Learning relevant to PE can also happen outside of the higher educational institution (HEI) (James, Warhurst, Tholen, & Commander, 2013). Skills could be acquired at home, during part-time work, through extra-curricular activities or other activities at the HEI. The extra-curricular activities are often complementary to the skills learned at HEI (Clark, Marsden, Whyatt, Thompson, & Walker, 2015). While extra-curricular activities are generally positive for their job application (Lundberg, Gaustad, & Krogstie, 2018), work experience may, however, make students less confident, since they become more aware over how the employment market works and what challenges they will face (Jackson & Wilton, 2017). PE can also be influenced by factors that are hard to change. PE might, for instance, be affected by the age of the student because older students tend to have a better awareness of the labor market (Jackson & Wilton, 2017).

Figure 1 illustrates the development of a student's PE during education, starting with a Pre-edu PE at the outset and ending with a Post-edu PE after completing the education. PE might increase over time, leading to a positive ΔPE_{Edu} . Some of the changes might be due to the studies (ΔPE_{study}) and some to other activities (ΔPE_{other}). An underlying assumption here is that a study program should lead to a better ability to judge one's employability. Ideally, we would expect both ΔPE_{study} and ΔPE_{other} to be positive. It is challenging to measure the two latter and understand how they interact, but by measuring ΔPE_{Edu} and considering other data about students' perception of the study program and factors of possible relevance to the students' learning and employability, it is possible to get some indication of what impacts on a possible observed (perceived) overall change in PE.

On this background, our first research question is: “*Does perceived employability for online IT students increase during the course of a study program?*”. We apply this question to a case comprised of online students in a bachelor program in IT.

Furthermore, it would be reasonable to think that the students who already have professional experience, have higher PE than students without this experience. Thus, our second research question is: “*Do online IT students with relevant job experience before education have higher perceived employability than students without such experience?*”

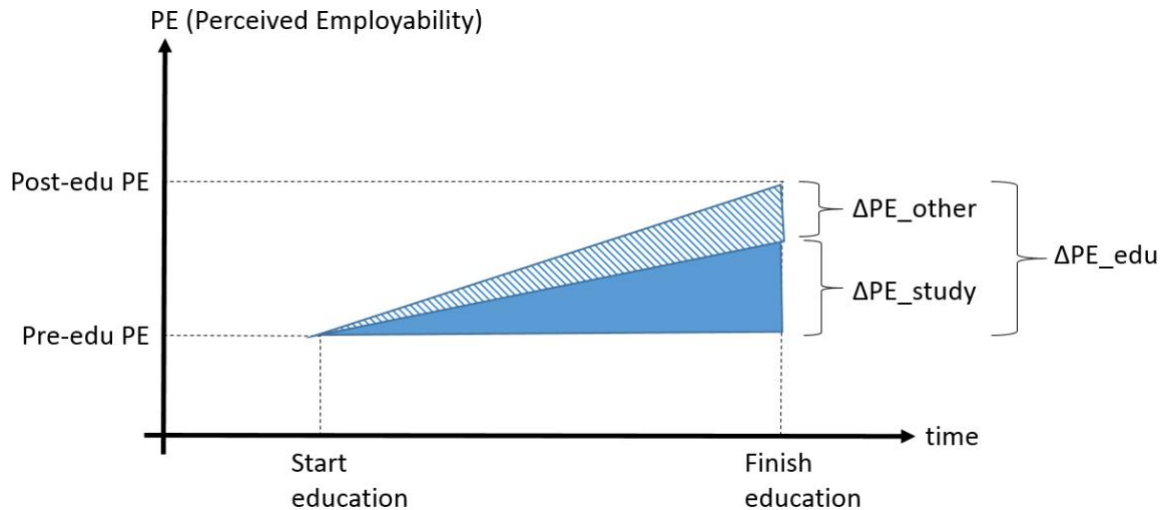


Fig. 1. Expected change in perceived employability during the course of a study program in higher education

2 CASE

The case addressed in this paper is the bachelor program Information Technology with specialization in Information Management (ITIM), which gives a broad basis for specializing in organizing, distributing, and maintaining a company's electronic information. The program is built up of smaller courses and is designed to be flexible and adapted to the needs of students who may have full-time jobs and need to take the study program part-time with a progression that fits them. Even though there are 45 study places for admission each year, only 15-20 graduates after three (or more) years.

ITIM is fully online and distributed, with no physical meetings, which means that students can study when they have time. Most of the courses are lesson-based, so the students read a lesson and do associated exercises. Video lectures and webinars are offered in some courses. Several courses are built around project assignments where students must collaborate through different collaboration solutions. This allows the students to gain competence in special areas, and at the same time, get trained in effective distributed interaction and collaboration. Almost all the ITIM students do their bachelor thesis in collaboration with industry, solving real problems.

The traditional way of going through the educational system in Norway is to complete high school before attending higher education. Students who start at ITIM have an alternative entry into higher education. ITIM students can be categorized into three different backgrounds (See fig 2); 1) Straight from high school or with an additional year of military service or folk high school; 2) Having been in employment for some years. These students often do not have any education beyond high school; 3) Having started after attending other higher education where they either a) felt the way of teaching did not fit them, or that they did not like what they learned, or b) wanted an additional degree to make themselves more sought-after in the job market or wanted to take a study program that matches their interest in technology.

When they start at ITIM, many of the students continue in their job. Some attend ITIM with 100% progression in addition to their 100% job, while others have half workload in their job and/or half progression at ITIM. Some students that had a job before entering the program quit their job to take the education with 150% progression.

The Norwegian Agency for Quality Assurance in Education (NOKUT) conducts an annual survey to measure the quality of all study programs in Norway. In this survey, ITIM gets a moderately high score on employment relevance, slightly lower than the average of all IT studies in Norway. Scale: 1=a small extent; 5=a large extent:

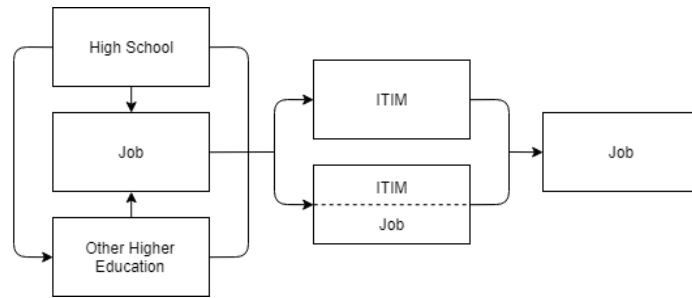


Fig. 2. Alternative entranceways to ITIM, different progression during the study, and at the end: a job

Table 2. Employment relevance in the ITIM program compared to the mean of all IT programs in Norway

The study program...	ITIM	Avg.
...is relevant for the employment market	4.1	4.4
...gives good employment possibilities	3.9	4.4
...gives competencies that are important in the employment market	4.1	4.2
...has good collaboration with the employment market	2.6	3.7

3 METHOD

For our research study, we used a mixed-methods approach, collecting data from the alumni by the use of semi-structured interviews combined with a questionnaire survey.

For the interviews, a total of 28 e-mails were sent out to alumni that graduated in 2017 or 2016. This resulted in seven semi-structured interviews; four alumni from 2017 and three alumni from 2016. The interview was held face-to-face, over Skype, or by telephone. An assistant transcribed the interviews. The assistant and the main author collaborated on the coding and analysis of the transcripts.

The results from the interviews were diverse and included interesting viewpoints on the ITIM study program. Some informants were very negative, while others positive about their learning outcome and employability from the study program. These findings were, however, insufficient for substantiating any conclusions about employability among the ITIM alumni. The analysis of the interview data helped us identify several questions that could be further explored by administering a survey.

For the survey-round, we contacted all alumni who had completed their education between 2010 and 2018. This gave a population of 93 possible recipients of the survey. Since the e-mail list consisted of email-addresses students had when entering education, it was hard to get responses, and some email-addresses were not in use anymore. After one initial email with a link to the survey, and another follow-up email, a total of 45 alumni (half of the population) did respond in one way or another: 29 alumni completed the whole survey, 7 answered most of the survey, and 9 alumni did not complete much of or did not want to participate in, the survey.

The main topic for both the survey and the interviews was employability, and what the alumni think they have learned from the bachelor program. The survey consisted of 27 questions where the majority of these questions were on a five-point Likert scale from “Strongly disagree” to “Strongly agree”. There were also some open-ended questions and “Yes/No” questions.

To capture Pre-edu PE, Post-edu PE, and ΔPE_{study} (see figure 1), we used survey items addressing the five aspects of PE (Berntson & Marklund, 2007) separately. Previous literature (Vanhercke et al., 2014) does not provide sufficient ground for us to combine the measurement of these five aspects into

a single measure of PE. By considering the PE constituents separately, we can explore possible differences among them. We ran chi-square tests, independent samples t-tests of mean difference, and paired samples t-tests of mean difference on the survey results.

One of the authors is the study program leader for ITIM and has broad knowledge about the program as well as a stakeholder interest in its quality and improvement.

4 RESULTS

In this chapter, we will present the results from the survey and the interviews.

The respondents and interviewees are alumni from the study program in question, but we use the term *students* for simplicity when we present and discuss the results. Most of the participants (71,4%) in the survey ended their study program during the last three years.

The results from the survey show that 86 % were employed before entering ITIM, 6 % was unemployed, and 8 % were students in higher education. We also asked if they had worked in IT before. To this question (N=29) 55 % reported having worked within IT previously, while 45 % had not.

4.1 Perceived employability

In our survey, the alumni were asked to answer questions about their PE before entering their education, and after they graduated. We expected to find a difference in PE before and after the education, i.e., a positive ΔPE_{Edu} (see Figure 1).

First, we tested the distribution of answers through the Chi-Square test, where we tested each PE aspect (see table 1) Pre-edu with the equivalent aspect Post-edu. All the five aspects of PE were significantly different Pre-edu compared to Post-edu: A. Competence $\chi^2 (12, N = 32) = 21.6, p = 0.04$, B. Contact network $\chi^2 (16, N = 31) = 42.9, p < 0.01$, C. Other organizations $\chi^2 (16, N = 31) = 40.7, p < 0.01$, D. Personal qualification $\chi^2 (16, N = 32) = 50.0, p < 0.01$, and E. Experience $\chi^2 (12, N = 32) = 25.3, p = 0.01$. We see that all the five aspects of PE have $P < 0,05$, which indicates that the students are coherent with each other. To find out which side the students' answers lean towards, a paired samples t-test was conducted (see table 3)

Table 3. A paired samples T-test between the five aspects of PE Pre-edu, and Post-edu

	M_Pre (SD)	M_Post (SD)	M_Diff	T	df	p
Competence	2.5 (1.4)	3.6 (0.7)	-1.1	-4.6	31	<0.01
Contact network	2.1 (1.4)	2.4 (1.2)	-0.3	-1.6	30	0,10
Other organizations	2.2 (1.4)	2.8 (1.2)	-0.6	-4.8	30	<0,01
Personal qualifications	2.5 (1.2)	3.1 (1.2)	-0.6	-3.1	31	<0,01
Experience	2.3 (1.4)	3.3 (0.8)	-1.0	-5.1	31	<0,01

We see that there is a significant change between the competence students had Pre-edu and what they reported having Post-edu. We see that Competence and Experience have increased the most, with 1 or more. On the other hand, we see that Contact Network only barely increases, with only 0.3.

4.2 Previous IT-job and PE

One of our early assumptions was that students who had previous job experience within IT (Group 1) would have a higher level of PE before entering the study program compared to students who did not have previous IT job experience (Group 2). The result shows that there is a significant difference between the two groups in three of five aspects Pre-edu and in four of five aspects Post-edu.

Table 4. Chi-square test of difference in PE between group 1 and 2 (with and without IT-job experience Pre-edu) prior education, for each aspect of PE, Pre-edu, and Post-edu, where N is the number of responses.

	Group 1 and 2 compared							
	Pre-edu				Post-edu			
	x ²	df	N	p	x ²	df	N	p
Competence	13.5	8	33	0.1	6.7	6	32	0.35
Contact network	23.6	8	32	<0.01	20.5	8	32	<0.01
Other organizations	16.2	8	32	0.04	15.9	8	32	0.04
Personal qualifications	13.8	8	33	0.09	28.1	8	32	<0.01
Experience	25.7	8	33	<0.01	16.6	6	32	0.01

Table 5 shows the Pre-edu difference in PE aspects between groups 1 and 2. Group 1, the students with previous work experience, has a higher average on all five PE aspects. The biggest difference is found for Experiences (Gr1 = 3.2, Gr2 = 1.2), while Personal Qualifications has the lowest difference (Gr1 = 2.9, Gr2 = 2.1) (see table 5).

Table 5. Independent samples t-test of differences in PE between group 1 and 2 (with and without IT-job experience Pre-edu) before starting the bachelor program

Pre-edu	Gr1_mean (SD)	Gr2_mean (SD)	T	df	p
Competence	3.2 (0.9)	1.7 (1.5)	3.4	27	<0.01
Contact network	3.0 (1.1)	1.3 (1.2)	3.9	26	<0.01
Other organizations	2.9 (0.9)	1.5 (1.5)	3.2	26	<0.01
Personal qualifications	2.9 (1.2)	2.1 (1.0)	2.1	27	0.05
Experience	3.2 (1.1)	1.2 (1.1)	4.8	27	<0.01

Post-edu the situation is different. There are no significant differences between student groups in four out of five aspects. Contact network is the only aspect with significant differences (Gr1 = 3.3, Gr2 = 1.7, p<0.01) (see table 6).

Table 6. Independent samples t-test of differences in PE between group 1 and 2 (with and without IT-job experience Pre-edu) after completed bachelor program

Post-edu	Gr1_mean (SD)	Gr2_mean (SD)	T	df	p
Competence	3.7 (0.8)	3.5 (0.7)	0.5	27	0.59
Contact network	3.3 (1.0)	1.7 (1.1)	3.8	27	<0.01
Other organizations	3.4 (1.0)	2.5 (1.2)	2.0	27	0.05
Personal qualifications	3.5 (1.1)	2.8 (1.1)	1.6	27	0.13
Experience	3.6 (1.0)	3.0 (0.6)	1.9	27	0.06

4.3 Attractive in the labor market

In addition to questions about PE, we asked some supplementary questions related to employability in the survey to validate the result. We asked a yes/no question about whether the education had made students more attractive on the employment market or not. All participants answered “yes”. On the follow-up questions on why they have become more attractive, the three most frequently given reasons were 1. that they now had a diploma that showed their skills (nine answers), 2. that they had increased their competencies (eight answers) and 3 that they had got a job (four answers) (N=29). The interview data does confirm this. On a question regarding whether or not ITIM had made them more attractive in the employment market, one participant stated: “yes, [the study] worked perfectly to get me a job – I went directly to a job [after I graduated]”. One other interesting aspect from the interview data is that several of the participants stated that they learned a little bit of everything. One participant stated: “I do doubt that ITIM makes me more attractive [in the employment market]. [... Because] you have very

many courses during these years, without gaining any good deep knowledge in any of the courses. And I think the employment market primarily sought-after deep knowledge.” Several of the informants in the interview suggested that the study program might not offer enough deep knowledge and that the study program was easy, perhaps even too easy.

An additional employability question was asked in the survey, where the alumni had five options. The question was “would you employ/hire a student from this bachelor program?”, where most of the alumni gave a positive answer: (N=29) eleven alumni would definitely hire someone, eight alumni would hire someone if they had the right electives, five alumni were unsure if they would hire someone, while four alumni would not hire someone without any other experience, and one alumnus would not hire at all.

To summarize the result section, we have two main findings:

1. The students in the online IT bachelor program have a lower PE when entering education (Pre-edu) than when they graduate (Post-edu).
2. The students who have had an IT job before entering the study program have higher levels of PE Pre-edu than those without such job experience. Post-edu, this difference has decreased except for the Contact Network aspect.

5 DISCUSSION

Our first research question was, “*Does perceived employability for online IT students increase during the course of a study program?*”? An underlying assumption was that our students gain job-relevant skills and knowledge by completing the study program (and possibly engaging in other relevant activity in parallel) and that this should lead to some increase in their PE, given the connection between PE and competence (Berntson & Marklund, 2007; Jackson & Wilton, 2017; Vanhercke et al., 2014).

The answer to the first research question is yes – for all five aspects of PE, there is a significant difference showing an increase in PE. Going back to figure 1, we see that ΔPE_{edu} is positive (see fig 1) (See table 3 for results).

One could argue that the positive change in ΔPE_{edu} is not an unexpected result. There are, however, similar studies with different findings: In the study by Jackson and Wilton (Jackson & Wilton, 2017), students in higher years of a business undergraduate program had lower PE than students in their first year. Jackson and Wilton argue that the difference may be the result of students becoming more aware of the challenges they will face as professionals and their increased understanding of the employment market. In our case, we have many students who already have experience as employees, often in (IT-) relevant types of work, when they enter the bachelor program. This might imply starting with a good understanding and awareness of the employment market and a relatively realistic perception of one’s employability. One could, therefore, argue that students do not get affected by the phenomenon discussed by Jackson and Wilton (Jackson & Wilton, 2017) because they already have a good knowledge and understanding about the industry before their education.

Even though all five aspects of students’ PE generally increase throughout the ITIM study program, we found that the increase in the Contact Network aspect is very small. This suggests that while the students have some degree of contact network at the beginning of the program, ITIM does not provide enough opportunities for extending the network. Collaboration with industry throughout the program is already in place through some course assignments and the bachelor thesis: The thesis should preferably be and typically is initiated by an industry partner (e.g., the student’s employer), addressing real-life problems rather than purely theoretical issues. However, we would like to see a marked perceived improvement in the students’ contact networks. An implication for the development of the study program is that collaboration with industry throughout the program should be even closer, which might be achieved by looking into and improving the existing collaboration activities and/or introducing new ones.

Considering the relative influence of ΔPE_{study} and ΔPE_{other} (see fig. 1) on the overall increase in PE, the data from our study provide no accurate measures. We can, however, reasonably assume that both play a role, in a way linked to the characteristics of the study program. Regarding ΔPE_{study} , ITIM provides students with several courses where there are practical tasks that need to be solved to increase

students' practical skills in combination with theory. Through obtaining these skills and getting knowledge about the employment market through industry realistic assignments, with the bachelor thesis as a good example, students can see the relevance between their study program and the employment market, and that the skills obtained will lead to increased self-efficacy, employability, and then again increase ΔPE_{study} .

Another explanation for the result could be that the study program is too easy – so that students do not experience resistance, leading to an unrealistic level of PE. According to the interview-data, this might be an issue: students perceive the study program as too easy. The informants were concerned about learning too little and wanted the study program to provide more opportunities to learn more in-depth. From the survey, we see that Competence and Experience have increased the most, which can indicate that the ITIM study program does provide students with good opportunities for developing competence and experience. This is also shown in the survey from NOKUT (described in the case-section) where students agree that competencies learned during the study are important for the employment market.

Regarding ΔPE_{other} , one likely source of improved PE is the work experience gained by the part- and full-time employed students in parallel with their bachelor studies. We see that students with relevant IT job experience before education, have higher Perceived Employability Pre-edu compared to the students without such experiences, but that this difference decreases during their education. Post-edu there are no significant differences between the two groups in four of the aspects of PE. One of the reasons may be that students without relevant job experience before the education are able to get relevant part-time job experience during the study program, and therefore increase their ΔPE_{other} (see fig. 1).

Post-edu there is only one PE-aspect that distinguishes students with or without relevant job experience, Contact Network. It seems that students with previous job experience had a contact network Pre-edu and that this contact network still is there. Neither students with nor without IT-job Pre-edu does seem to have increased their contact network much during the education. As previously argued, the study program needs to provide opportunities for students to get to know each other, as well as the industry better so that they could increase their contact network if they aspire.

The answer to the second research question “*Do online IT students with relevant job experience before the education have higher perceived employability than students without such experience?*” is that there is a difference in PE between the two groups before the education, but Post-edu there is only one aspect that separates the two groups.

The measurement of PE by having students rate the five different aspects of PE finds support in the research literature (Berntson & Marklund, 2007; Jackson & Wilton, 2017), which was the basis for our use of such survey items in the research reported in the paper. Our study shows that there is coherence between the use of PE measurement tool used and whether informants feel employable for the industry. We know from the research literature that PE is related to the individual's well-being and mental health (Berntson & Marklund, 2007), which means that including items on PE in a student survey might provide information about such issues.

We have used PE to research how alumni students experienced their perceived employability retrospectively – both before entering their education and after completion of their bachelor program. This is a limitation to the study. Over 70 % of the survey participants graduated during the last three years, and one could expect that they know what is needed in the industry after started working there. The retrospective view on PE could, therefore, give answers that are more in agreement with how industry is working compared to measuring PE when students start the study program, without being aware of what is expected in the industry. The findings of our study substantiate that it is reasonable for the specific study program of our case to make some changes: fewer courses will give the students a deeper specialization in areas currently high in demand in the industry and give the study program a uniform profile. This is likely to contribute to students' perception of developing relevant and sought-after competence.

The results from our study further suggest that PE could be actively used as a parameter in study program development more generally, to help measure the effect of the changes in profile, specialization, and depth. PE as a measurement tool can be used by various stakeholders. An obvious possibility is to use it to ensure that the students acquire relevant knowledge and skills in education and experience these as

relevant in the industry. This can again be linked to the development of the study program in order to be able to uncover the student's experience of lack of knowledge or skills. Addressing employability by considering PE along with other perspectives, including a competence-based perspective, may be necessary to compensate for an acknowledged weakness of PE: the lack of information about *why* individuals see themselves as having a particular level of employability (Vanhercke et al., 2014). As pointed out in our research, the development of PE happens both through the study program (i.e., the learning activities) and on other arenas (such as hobby projects or a job), which should also be taken into account.

6 LIMITATIONS AND FURTHER RESEARCH

Having students assess their PE (both Pre- and Post-edu) retrospectively introduces a validity threat that can be avoided by measuring PE in the same student cohort at several points in time, i.e., in a longitudinal study. Further research should measure PE early in the first year and repeated, e.g., close to graduation and a couple of years after. This would lead to a more precise picture of students' initial PE and its development over the course of completing the study program. Furthermore, insight about first-year students' PE and its different aspects can be used as input to faculty and others directly involved in supporting students' learning from day one.

7 CONCLUSION

The research presented in this paper used Perceived Employability (PE) as a measurement tool for identifying whether students think that an online IT bachelor program provides them with the right competencies, skills, and understanding so that they become employable within the IT-industry. We found that PE does increase during the education, and in this case, it is most presumably a combination between what is learned from the study program itself and what is learned through relevant job experience gained in parallel with the studies.

The findings in this study may be transferable to other IT study programs. The study program in this paper has many similar courses with study programs held at campus, though taught in different ways. Therefore, there are grounds for claiming that there are transfer values in relation to the acquired knowledge at this study program are similar to other study programs. In this research several students had work experiences prior their education, which also are the case for some campus students. This imply that we as a higher education institute need to not only help establish a contact network for online students, but also for campus students.

Considering the evaluation and development of study programs more generally, our results show that exploring students' perceived employability can enrich our understanding of how students perceive a program. We recommend measuring PE already early on in the first year of a study program.

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