IN NEED OF AN INTERACTION DESIGNER?
WHAT THE INDUSTRY Wants AND WHAT IT ACTUALLY GETS!

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ABSTRACT
Technological changes over the past several decades have enabled us to communicate in a variety of different ways. The increasing use of digital services and online information highlights the importance of interaction design and how products/systems influence how we interact and communicate. This paper aims to fill a research gap by investigating, on the one hand, the kinds of qualifications and skills interaction designers have; and, on the other, expectations among companies in their search for interaction designers. We used a mixed-methods approach and combined qualitative and quantitative data. The findings reveal that interaction designers differ in terms of educational background, length of work experience, knowledge and skills concerning key topics and computer tools, and interest areas. Furthermore, we found that when a company seeks an “interaction designer” in job ads, this title serves as an umbrella term for skills ranging from highly technical to soft design and interpersonal skills. Companies are also looking for people who have skills beyond core designer tasks, as insights into strategy or organizational processes. Comparing the skills and educational backgrounds of interaction designers with those recruiters are calling for shows a consistently mismatched pattern between what is expected and what is received. Companies and practitioners should be more realistic in their expectations regarding what competences interaction designers should have.

Keywords: Information systems, human–computer interaction, user experiences, interaction designers, technological development, mixed methodology, text analysis, online survey methodology

1. INTRODUCTION
During the last few decades, technological changes have influenced how people communicate, collaborate, and interact with each other. Traditional face-to-face interactions have largely been replaced by online dialogues and the use of technologies. Thus, digital channels play a critical role in society across macro-, meso-, and micro-levels. Hence, website design, in presenting information in online spaces in ways that immediately guide the visitor to the right place, plays a vital role in today’s information society. Consequently, we need to strive for greater user experiences and high-quality interactions to ensure that individual visitors are put in the front seat and can find their way around easily. In this context, interaction designers have a crucial role: to ensure that the user’s requirements and needs are met. Interaction designers construct the opportunities for tasks and processes that users can encounter in software and information systems at the interface level (Rosenfeld & Morville, 2002). Thus, designers are essential in shaping how the end user understands where to locate information and how information components are interrelated in meaningful and detectable ways; moreover, they also play a key role in citizenship, value creation, and sociability. In recent years, organizations and companies

have recruited interaction designers to meet new demands in the products and services sectors. However, companies and organizations have also changed dramatically in the last century.

The qualifications of interaction designers and other new professionals do not posit the characteristics of “work” associated with the industrial economy (Barley & Kunda, 2001), which is characterized by an occupational structure (Barley, 1996a). Work in the past was less differentiated, and it was easier to know what people did simply because there was less to know (Orr, 1996). Work today is highly complex and “invisible” (Suchman, 1995), with a strong emphasis on digital competence in our information society. Currently, many traditional work tasks are becoming automated and/or replaced by machines or robots; at the same time, new jobs are being born, while other jobs have yet to be invented. Technological development is occurring faster than other societal changes, which challenges educational institutions to keep pace with what organizations need and expect from different occupations’ competences and skills. What skills recruiters expect different occupations to include can be observed in work advertisements (hereafter referred to as ads). For example, studies of ads for librarians over the past few decades have shown an increase in demand for computer and IT skills (Kennan, Cole, Willard, Wilson, & Marion, 2006). This accord well with Leitheiser’s (1992) findings of a “skill inflation” in job ads in the nineties.

There is no universal or prescribed understanding of what kinds of competences interaction designers should have. Thus, interaction designers lack a shared disciplinary tradition, which makes uniformity when recruiting difficult for organizations as they are dependent on hiring designers who match their individual needs and requirements. Interaction design is also characterized by accelerated technological development and the increasing need for new skills—a hallmark of our times—because professions such as these are not static but dynamic and constantly changing in step with societal developments. This research paper relies on empirical insights to explore the interplay between the skills and competences interaction designers actually have and those organizations expect and call for in their recruitment ads.

The rest of this paper is structured as follows: Section 2 presents the research objectives of the present study, while Section 3 provides our theoretical frame and relevant research. Section 4 presents our methodology and Section 5 provides the findings of our study, which are discussed in Section 6. Concluding remarks are provided in Section 7, along with suggestions for future research venues, study limitations, and actions recruiters and practitioners should consider.

2. RESEARCH OBJECTIVES

This paper aims to fill a research gap by investigating, on the one hand, the kinds of qualifications and skills interaction designers possess; and, on the other, expectations among companies in their search for interaction designers. Toward this end, we provide a theoretical contribution and some practical recommendations for the design industry. Our starting point is grounded in literature from the field of information systems (IS), interaction design (ID), and human–computer interaction (HCI). This paper highlights the importance of interaction design in our society and anchors its contributions in existing knowledge from these fields. Consequently, we provide insights into the kinds of competences the industry expects interaction designers to have and the skills and competences they actually possess. Given the substantial growth in the digital industry, obtaining insights into interaction designers’ skills is crucial; as such, the results from this study should be of interest to the design industry, educational institutions, and academia.

To get a better picture of the interplay/fit between industry expectations and interaction designers’ skills and competences, this paper draw on actual requirements and expectations by companies (n = 38) in their search for interaction designers. We mapped these findings to the results of an online survey conducted among interaction designers (n = 307). This approach provided us with a clear, up-to-date profile of the designers, their individual backgrounds, and their skill levels, along with their design-related experiences and technical qualifications pertaining to the role of a designer. Worth noting here is that, in this paper, we emphasize web and mobile apps, not physical products. However, our findings might also be relevant to such products to some extent. To our knowledge, no similar studies have been published in previous research.
Consequently, this paper provides a unique contribution by not only examining job ads, as previous research on IT skills has mainly focused on, but also by adding a creative lens in the sense that several different empirical components were included. We aimed to develop some practical implications as well, which resulted in two interest groups: academics within the area of interest, and practitioners within the design industry. In addition, the results of this study may also be valuable in terms of the content of interaction design courses (bachelor’s and/or master’s level) and for the further development of such programs/courses. Finally, this study empirically illustrates how technological development influences work and occupations, a topic widely debated at present.

3. THEORETICAL APPROACH AND RELATED RESEARCH

In this section, we begin by defining interaction designer and its role with respect to task performance and expected contributions during a system development process. A literature review is provided in order to shed light on information systems development and the fields of interaction design and human–computer interaction. The aim of anchoring the present paper in these research fields was to increase understanding about how and to what extent future designers will have the expertise needed for creating great products and user experiences; moreover, another aim was to determine to what extent the design industry searches for people who fit interests and needs related to system development and quality improvements of interactive products.

Because online communication and interaction is increasingly replacing traditional face-to-face interaction with, for example, chat functionality, automatization of services, and interactions in social media, there is a strong need for skilled knowledge within the field of interaction design (ID) and human–computer interaction (HCI): “One of the major concerns of professional practitioners in the field of HCI is the design of interactive computing systems for human use. As a result, it is a basic goal of HCI designers to make computers more usable and more receptive to the user’s needs” (Huang, 2009, p. 1). In most cases, the design of interactive products is neither a straightforward process nor a “quick-fix” job. Design covers a wide range of tasks and activities that involve people (e.g., designers) with various types of knowledge, interest areas, and skills: “Principles and practices of design from all manner of design disciplines are used in designing interactive systems. Ideas and philosophy from architecture, garden design, interior design, fashion, and jewellery design all crop up in various ways and in different forms. It is not easy to simply pick up ideas from design disciplines, as much design knowledge is specific to a genre” (Benyon, 2014, p. 19). Expertise needs to be gained through extensive experience within a given field and the acquisition of insights about what works and what does not—in different products and contexts of use. It is also important to be aware of individual users and their specific skills, needs, and interests. In this regard, interaction design has grown from a highly specialized discipline to a working field managed by people with shared backgrounds and education, but who still label themselves “interaction designers” (Saffer, 2010).

As “interaction designer” is not a protected work title, specific types of education and experiences are not needed. According to Goodman, Stolterman, and Wakkary (2011), there is a mismatch between research conducted within the field of HCI and actual practices within interaction design. Therefore, a closer relationship and knowledge exchange between the two disciplines could bridge this gap and provide useful insights and recommendations on the design process. Bruno and Dick (2007) also stressed the importance of bridging this gap, conducting interviews with usability practitioners that revealed that an iterative process, stakeholder involvement, and usability goals are particularly important topics in the development of a successful project. “Interaction design is mostly carried out by multidisciplinary teams, where the skill sets of engineers, designers, programmers, psychologists, anthropologists, sociologists, artists, toy makers, and others are drawn upon. It is rarely the case, however, that a design team would have all of these professionals working together. Who to include in a team will depend on a number of factors, including a company’s design philosophy, its size, purpose, and product line” (Preece, Rogers, & Sharp, 2015, p. 10). This means that large variations exist within the design industry, and that each project is to some extent unique. Within the field of interaction design and HCI, usability issues are vital components in creating great user experiences. In this regard, Boivie, Gulliksen, and Göransson (2006, p. 601) stated, “Usability professionals operate under many
different names; HCI (human–computer interaction) expert, usability engineer, interaction designer, user experience architect, cognitive scientist, etc.” Consequently, the work title “interaction designer” is an umbrella term that can be operationalized in various ways and includes a number of work tasks. Working within interaction design does not involve a standardized set of duties and areas of responsibility compared to other occupations, where tasks are more predictable (e.g., accountant, lawyer).

Many different design tasks are carried out in separate phases of the development process; but, in the end, all of the activities performed are “put together” to act as a whole. Contemporary designers of interactive products need to possess knowledge about users, various technologies, the facilitation of great user experiences and, lastly, how people interact with each other (Preece, Rogers, & Sharp, 2015). As of the end of 2016, the design industry must employ people with great knowledge about how to satisfy users’ expectations and needs in the coming years. In this regard, “To design systems that fulfil today’s high expectations concerning usability, human–computer interaction (HCI) experts need to work closely together with team members from other disciplines. Most notably, they need to cooperate with application domain experts to identify the concepts, tasks and terminology of the product environment, and with the development team to make sure the internal system design supports the interaction techniques required” (Borchers, 2001, p. 359). The need for IT and design skills is without a doubt urgently needed in our time, where digitalization processes are replacing traditional services. For example, last year, almost 48 million Americans used online tax preparation software rather than human tax professionals to file their tax returns (Susskind, 2015). Due to technological advancement, much work has become automated (e.g., tax preparation software) or replaced by smart software or robot technology with artificial intelligence (inclusive administrative management tasks such as scheduling, resource allocation, reporting, and offering strategic advice to top management (Kolbjørnsrud, Amico, & Thomas, 2016). In the wake of this transition, new professions are being born, and some may not even have been invented yet. Nonetheless, future professions will rest upon such technological progress (Susskind & Susskind, 2015). How ongoing technological developments are influencing current occupations such as interaction design, and what skills these occupations need to demonstrate to keep pace with industry needs, is clearly of critical importance.

What the industry actually needs can be determined by work ads, whereby organizations call for specific skills and competences typical in contemporary society. Although there is a lack of research contributions specifically regarding industry expectations and interaction designers’ knowledge and expertise, research with similar approaches has been conducted. Different studies of IT skills requested in ads have found a consistent pattern: employers are seeking an ever-increasing number and variety of skills from new hires (Gallavín, Trux, & Kvasny, 2004). As early as 1982, Nunamaker, Couger, and Davis (1982) observed that business knowledge, interpersonal skills, and management knowledge were becoming increasingly important. Also Leitheiser (1992) observed such a “skill inflation”, concluding that where most skills (IT-specific and soft, personal skills) were likely to become more important in the future. Moreover, Trauth, Farewell, and Lee (1993) identified an expectation gap caused by a discrepancy between what kinds of skills IT practitioners called for and what academic institutions taught in their programs. Also, a study of Australian and American job ads seeking librarians (Kennan et al., 2006) found an increasing lack of clarity in the Australian ads about the skills and competences required of librarians. The American job ads, on the other hand, ranked jurisdictional knowledge and professional qualifications higher than the Australian ads. Interpersonal skills, behavioral characteristics, and technical service skills were emphasized in both countries. Studies of job ads in the 1970s highlighted an increase in the demand for computer and IT skills (Kennan et al., 2006). During the 1970s, companies like Commodore and Apple introduced computers to the market; by the 1980s, IBM’s computers had entered many organizations and consequently changed work processes. Hence, the introduction of technology in organizations also required new kinds of skills to meet new demands. Further, the study of job ads found that recruiters were calling for particular behavioral characteristics and interpersonal skills (Kennan et al., 2006). Similarly, today’s technological changes, described above, are not only occurring at a much faster rate than they were only ten years ago, where research had already observed the tendency for “skill inflation” for IT staff; such changes are also clearly influencing the kinds of competences and skills companies require of workers in relatively new and more specialized professions, such as interaction design.
4. RESEARCH METHODS
In this study, we used a mixed-methods approach and combined both qualitative and quantitative data. Mixed methods is a current academic research trend (Small, 2011). A mixed methodology that combines quantitative and qualitative tools, as we used in the present study, is recommended for gaining “holistic” data—a more complete picture of the topic being studied (Moore, 2011). As quantitative and qualitative methodologies each have their own strengths and limitations, combining them provided unique insights in our study. A mixed methodology also requires the combination of data collection techniques or triangulation, which is typically understood as using multiple methods to study the same topic (Denzin, 1970). Between-method triangulation has been argued to provide a more processual approach and was used in our analysis to obtain a more complete understanding of the complexity of the object of study. A presentation of the empirical components included in the present study is given below.

4.1 Job advertisements
Recruitment advertising includes printed or digital ads whereby the employment market communicates its need for individuals with specific competences and skills (Cullen, 2004). Over a time period of five weeks (starting in August 2015), a weekly search was completed using www.finn.no/jobb, the largest search engine for job ads in Norway. Finn AS that hosts finn.no, is owned by Schibsted Media Group ASA (89.88%) and Polaris Media (10.12%). On average, 300 000 ads are in the database every day (Finn.no, 2015), 6000 of which are work ads (Schjold, 2015). Correspondence with the product director at Finn.no (October 7-8, 2015) stressed the importance of distinguishing “adsverts” from “work positions,” as several positions can be listed within the same advert. Statistics provided to us by Finn.no reveal that the majority of work ads are placed at the beginning of each year (January–March). During the month of July, the number of ads falls substantially, but the number of published positions in August–October are similar to the number between April and June. Thus, our sample of the ads is representative and valid. Only one keyword, interaction designer (in Norwegian: Interaksjonsdesigner), was typed in, as it is a well-known work title in Norwegian professional circles. The results were printed out immediately after the weekly search was conducted. The search took place at the beginning of each week (Monday or Tuesday) during the morning.

4.1.1 Data analysis
After the search was completed, we categorized the ads using the following categories: type of company (location, size, business domain), background required by the company (qualifications, education, work experience), work tasks within the company (technical versus design-oriented), and other relevant information highlighted in the advertisement, which varied between companies. During the analysis process, we used Microsoft Word to structure and categorize the data. We also used pen and paper for parts of this process. We ended the data collection after 42 job ads had been identified. During the text analysis, four of the advertisements were removed from our sample because they did not list interaction design or similar domains in the job description. In sum, our sample consisted of 31 ads for a total of 38 work positions (some of the ads listed more than one work position).

The content of job ads is typically written by HR personnel, in collaboration with the person listed as the contact person in the ad. Some parts of job ads are standard (e.g., company benefits), while the parts describing key characteristics of the person being sought, work tasks, and expected qualifications are individual descriptions, written specifically for the specific type of work announcement. Those who are listed as contact persons indicate that different work roles are available for further information or questions about the announced work positions: specialists or professionals from the relevant discipline, middle managers, HR personnel, recruitment resources, or department managers. The characteristics and details listed are likely to differ if formulated by an HR person or manager rather than a person with more depth and insight into the position being advertised; thus, it was important to bear in mind who wrote the ad during our text analysis. The ad needed to be interpreted in two ways, within the ad and between ads, because the context in which the ads were created differed from, for example, the survey, where each answer was methodologically compared as equal and comparable regardless of
the respondents’ contexts. Text analyses are translations in the search of meaning (Kvale & Brinkmann, 2015). The translations were completed by us, the researchers, and were shaped by our own worldviews. However, both researchers have personal experience with interaction design, from both an educational and practical point of view. With domain-specific knowledge of the topic of the study in our text analysis, we combined the processes of distancing and immersing as research strategies, as recommended by de Jong, Kamsteeg, and Ybema (2013) for making the familiar strange for qualitative scholars.

4.2 Online survey data
The survey was launched in autumn 2012, for two months, with 307 respondents when it was finished. The survey was distributed via email to members of the IxDA community in Oslo (which mainly has members working as interaction designers) and to students at selected colleges; the email included an invitation to participate in the survey, which was enclosed as a link to SurveyMonkey. The sender of the survey was the Interaction Design Association, Oslo (IxDA, Oslo). IxDA is a professional group based in Oslo with over 2000 members working with interaction design and user experiences. The purpose of the study was to examine diversity in the digital design industry. Survey respondents were recruited through a snowball method: The email recipient was encouraged to forward the email to others. A pitfall of the snowball methodology is that it risks leaving key persons out of the sample and could ultimately consist only of individuals connected to each other (Hanneman & Riddle, 2005). Another drawback of the snowball method is that we do not know how many people received the email with the survey invitation and thus cannot be sure of the survey’s response rate.

However, the survey data show that the respondents were distributed evenly with respect to gender (42% women, 57% men). The survey respondents comprise two groups: students studying interaction design (n = 33) and individuals working as interaction designers (n = 274). The majority of the respondents were employed (89.25%), and a small group were students (10.75%). Respondents who participated were only from the Oslo area (the capital of Norway). The largest group of respondents were also relatively young, despite not being students, as listed in the industry generally: 26–30 years old (20%), 31–35 years old (29%), and 36–40 years old (20%). Thus, despite the limitations of the snowball method, the main tendencies are believed to have been captured by the survey. The questionnaire in the survey consisted of topics regarding background information (e.g., gender, age, job position), education (e.g., level, institution, subjects), work experience, motivation for working with digital services, knowledge in relation to design subjects, knowledge of software/tools, income, and the use of social media. In addition, an open-text comment field was included. This provided us with qualitative comments from the respondents, which served as a complementary addition to the quantitative data. With regard to data analysis, for the purpose of this paper, we only performed descriptive analysis.

4.3 Strengths and weaknesses in the data
The authors of the present paper have different specializations and work experience and thus have substantial combined experience handling both qualitative and quantitative data. This combination allowed us a unique opportunity to combine different types of data sources. Furthermore, since we analyzed the data and discussed the findings together, productive and valuable insights about the topic of interest were gained. Generally speaking, having another researcher examine the same dataset minimizes the risk of biased interpretations of the data and findings (Emerson, Fretz, & Shaw, 2011). Consequently, in our study, we had an open rather than narrow perspective. Additionally, drawing on both qualitative and quantitative data gave us the opportunity to favor the strengths of the different data sources and the knowledge we could gain from each of them. The respondents who contributed to the survey work as interaction designers (or as students in the field) and are members of the Interaction Design Association, Oslo (IxDA, Oslo). Therefore, the survey captured the main target group for this study (those who practice interaction design and are not still studying it). Moreover, collecting contemporary job advertisements from a leading online database gave us valid data and the chance to reveal patterns and trends in ads, along with unique details from companies looking for interaction designers in 2016. One can also argue that job ads are generated to attract workers but do not necessarily provide a great job description.
There are some noteworthy limitations in this study that should be taken into consideration. First, the survey respondents were all from the Oslo area; thus, generalizability to the rest of the country and Europe as a whole is debatable. However, the respondents were, to our knowledge, originally from various places in Norway, and their background, education, and skills are most likely not unusual for the population. Therefore, they appear to be highly representative of the work field they represent: interaction designers. Second, in this paper, we mainly provide descriptive data from the survey, and no advanced statistical analysis was performed. This could, however, be pursued in future research projects. Additionally, the analysis can be compared to other types of data sources (e.g., qualitative interviews with interaction designers). In sum, we found that the validity and reliability of the present data were adequate to meet the academic criteria and fulfill the research objective of the present study.

5. FINDINGS
In this section, we first provide a text analysis of the job advertisements identified in the present study (Section 5.1), before moving on to the outcome of the online survey (Section 5.2).

5.1 Job advertisement: Finn.no (text analysis)
5.1.1 The recruiters
As a starting point, 24 of the 38 job advertisements (represented by 31 ads) called for “interaction designers” for recruitment to an IT or consultancy industry; 4 ads were recruiting for banks or finance, 3 for the public sector, 3 for the telecom industry, 3 for agencies, and 1 for one of the largest media company in Norway. When the ads were analyzed further, interesting sub-categories of the title or profession were revealed. Although the majority of the ads explicitly called for well-known titles such as “interaction designers,” “UX-designers,” or “front-end designers” (16), there were also several groups of titles that denoted skills from closely-related domains, e.g., back-end developers (6) or graphic web designers (2), online content developers (2) and from more recently introduced sub-professions of interaction design, e.g., service designers (4). Lastly, the largest groups of roles or titles after “interaction design” were related to a whole new type of competence, namely knowledge of strategy, organizational processes, business models and development, and leadership (8). These findings show that interaction design work ranges from highly technical duties to soft design and human skill-related tasks. Therefore, the content of the work tasks in this domain are varied and depend on the type of organization and the expectations of recruiters (organizations).

5.1.2 Work titles
The results revealed a highly variable and inconsistent use of work titles (e.g., back-end manager, service developer, and digital expert, among others). The term designer is often used, largely in combination with other words (e.g., UX designer). Otherwise, titles vary based on the type of work and the extent to which it focuses on design versus technology issues. The title of “interaction designer” is broad and seems to be linked to the context of the tasks to be performed (see Section 5.1.3). The pattern also demonstrates that interaction design is a widely ranging and inconsistent umbrella term that requires many different skills and knowledge types from individual designers. Based on our knowledge, there are very few people who are extremely skilled in both technical and design-related tasks. An interesting question, then, is to what extent the work title reflects the actual tasks to be performed and the designer’s educational background. This question leads us to the next section.

5.1.3 Work tasks and educational backgrounds
Twenty-eight of the 38 work positions had either a vague relationship or no relationship to the jobseekers’ educational background. For example, statements such as “relevant education” or “education in IT” did not provide any insight whatsoever into the kind of competence and skills the job required. Additionally, 15 of the 38 positions did not list work tasks of the job at all. In the few ads that did list them, there is a strong connection between job title, work tasks, and required background, and the recruiters, typically, have good knowledge of the field that the job is about. One such ad was from the media actor, which has an independent department working solely on technical and digital media
In the analysis of the job advertisements, we also found that the companies required many different skills from an interaction designer, ranging from highly technical skills to more soft and human skills. In order to paint a clear picture of such variety, Illustration 1 gives examples of different knowledge types and skills required from an interaction designer.

Illustration 1. Examples of knowledge and skills required from an interaction designer.

When comparing the skills and educational backgrounds the recruiters were calling for in the job ads, a consistent pattern of mismatch was found. For example, sought-for knowledge such as strategy, organizational processes, business models and development, and leadership were not mirrored in the educational requirements set by the recruiter. To gain knowledge of these disciplines would require education in fundamentally different areas than interaction design. Additionally, strategy, organizational processes, business models and development, and leadership are independent disciplines, very different from educational programs in design and related fields. In general, we also observed that the organizations specified numerous requirements and knowledge in the ads, and that the skill areas ranged from pure design skills to a variety of other knowledge areas.

5.1.4 Expectations of personal skills
The requirements specified in the ads were not listed under educational requirements, but were typically listed in relation to expectations regarding personal skills. For example, some recruiters were looking for people with “convincing presentation skills”: “We emphasize that our consultants in addition to developing and setting up solutions also need a business understanding,” and should “inspire the whole organization to become design thinkers,” or “know digitalization well and … help the client with understanding what kind of solutions will work in their market. Create holistic concepts that meet both the users’ needs, and the organizations brand and business model,” to name a few. Thus, a gap exists between what the recruiter expects from the jobseeker’s educational background and the work tasks listed. This gap seems to be filled by or encapsulated within descriptions in the jobseeker’s experience, personality, and personal skills. For example, some ads state that the employees should have a strong nose for sales and an in-depth understanding of business models and market opportunities; they should also be able to lead projects, understand organizational processes, or be good communicators who can easily translate customer requirements into concrete actions. These are not competences that interaction designers acquire while studying interaction design. In addition, ads require personalities that are extroverted, outgoing, social, eager to learn, good with communication, and have a good social IQ, among other qualities. To summarize, the text analysis of the job ads reveals a gap between the skills recruiters call for and the educational backgrounds listed. Work tasks, in some cases, are also lacking in the announcements.

5.2 Online survey data (analysis)
5.2.1 Educational backgrounds
The analysis from the survey shows that respondents have qualifications from different institutions in Norway. In terms of fields of study and educational direction, industrial design and studies related to
computer science dominated. Beyond this, there were also many who had other, more diverse backgrounds, such as psychology, communication technology, economics, media studies, and graphic engineering. Approximately 13% of the respondents were educated abroad (no special educational institution dominated). Thus, the respondents had educational degrees from very different educational institutions that were not homogenous with respect to their interaction design programs.

5.2.2 Motivation and technical skills
To address questions related to why designers want to work with digital services (as students), we asked respondents whether designing websites, interactive services, mobile applications, and social sites (among other goals) was a motivation for their choice: 68.18% answered “yes,” 7.58% responded “no,” and 24.24% answered “maybe.” The respondents gave various reasons for why they wanted to work as interaction designers. While some were interested in physical products, others enjoyed “working with ideas and concepts.” Some were “more interested in print, although I am also interested in technology.” Clearly, interaction designers have a variety of motivations for their choice of profession, but some are more technically oriented, while others are more interested in abstract ideas and forms. The use of software tools and various technologies is typical in interaction design, particularly in relation to digital services, apps and websites. The respondents were questioned about their knowledge and skills in this regard and the results demonstrated which tools were most dominant: Adobe Photoshop, Adobe Illustrator, and Adobe InDesign. In addition, the following tools were also widely used by interaction designers: HTML and related frameworks, CSS and related frameworks, prototype tools like Balsamiq and Axure, project management tools like Basecamp, Jira and AgileZen, and publishing tools like WordPress, Enonic, Episerver, and Drupal. Thus, there is variation among interaction designers in their use of tools, ranging from pure programming tools requiring technical skills to content-management systems, where it is relatively easy to design and develop solutions.

5.2.3 Different tasks and topics learned during interaction design studies
Of the 307 respondents, 218 answered the question about what kinds of topics they had learned during their studies. Concept development was the most common topic in study programs: 37.85% answered that concept development was “central in their program,” while 22.90% stated that it was “somewhat central.” However, at the same time, 14.95% said that concept development was “little prioritized,” while 22.43% stated that it was “not part of their education” at all. Interestingly, few of the programs included all 19 topics (e.g., concept development, information architecture, universal design, etc.) listed in this survey. Moreover, 26 of the 218 respondents added a number of topics not listed in the questionnaire. Several explained that the topics listed as answer alternatives were not offered while they were studying, likely because they had completed their studies many years ago, before “apps and social networks were part of people’s everyday life.” This is a reasonable conclusion, since the majority of respondents were no longer students. However, for some, it came as a surprise that they had not learned many of the recent topics within the discipline. As one of the respondents wrote in the open comment field in the questionnaire: “You need to bear in mind that designing for digital media was not relevant during our education. In addition, ‘design theory’ and ‘research into design practice’ were missing as an alternative. The first time I learnt about these topics was while I was a PhD student, and I was really wondering why I hadn’t learnt about this before in my studies.”

All of this clearly shows that interaction designers have a variety of different educational backgrounds—that what they learn in study programs in interaction design varies widely—and that those who have been working for some time have learned many of the topics and tasks interaction designers encounter while working. This section and the last quotation illustrate two key points: first, that educational organizations do not have a shared disciplinary platform that would increase the predictability of what interaction designers learn during studies; and second, that societal and technological developments seem to occur much faster than the educators’ organizational structures, but not for the recruiters’ organizational structures. In other words, what a company expects from interaction designers does not correspond with what interaction designers actually know and know how to do. Thus, on a macro level, there is a mismatch between what recruiters expect and need and what educators provide in their educational programs.
To summarize, interaction designers have different educational backgrounds, durations of work experience, knowledge and skills in key topics, computer tools, and interest areas. Interaction design covers a diverse group of people, yet lacks a shared disciplinary basis that would promote predictability for organizations when hiring interaction designers.

6. DISCUSSION

The present paper aimed to provide, on the one hand, insights into the kinds of qualifications needed by interaction designers; on the other, it sought to highlight the expectations of companies regarding the kinds of services that interaction designers should provide. Compared to some years ago, many people are now labelling themselves as interaction designers, resulting in a frequently used position with a high variety of tasks performed (Saffer, 2010). Working with the design of interactive products ideally requires a design team consisting of people with different knowledge and skills to contribute (Borchers, 2001). The title “interaction designer” was revealed to be an umbrella term (work position) covering a variety of individual skills, where work tasks and requirements are largely anchored within individual companies/products and development contexts.

In this regard, professionals within the usability field operate under names such as HCI expert, usability engineer, and interaction designer (Boivie, Gulliksen, & Göransson, 2006). An interaction designer not only performs jobs with clean design missions, but also completes tasks that require additional knowledge and skills. In many cases, an interaction designer must be flexible and adaptable to the requirements set by the organization, to available resources, and to the people involved in the design process. It is also very important to possess good interpersonal skills and the ability to communicate thoughts and ideas during a design process. The text analysis performed in this study identified a large gap between companies’ expectations of what kinds of knowledge, skills, and competences interaction designers should bring to their organizations and what such designers have in fact learned during their studies. This finding corresponds with previous research (Gallavin, Truex, & Kvasny, 2004; Leitheiser, 1992; Nunamaker, Couger, & Davis, 1982; Farwell & Lee, 1993) and is also in line with Kenan et al.’s (2006) research on work ads as indicators of the increasing speed and breadth of technological change. There is a consistent pattern of a growing lack of clarity about the skills, competencies and qualifications specified in job ads (Cullen, 2004).

Furthermore, our analysis revealed that the occupation of “interaction designer” can be divided into numerous sub-categories that cover, on the one hand, both “soft” and “hard” design knowledge and skills; and on the other, knowledge of very different educational programs, such as strategy, organization, communication, and business and leadership. These findings reveal that being an interaction designer requires far more knowledge than just pure design and technical skills. In some cases, the design industry expects more than they should in job ads. Although usability professionals operate under various names, e.g., interaction designer (Boivie, Gulliksen, & Göransson, 2006), they are not necessarily capable of covering an overwhelming number of areas. However, designers do need to have broad knowledge concerning users, technologies, and exemplary interactions (Preece, Rogers, & Sharp, 2015), and members of design teams must each provide unique contributions to their projects (Borchers, 2001). Additionally, the text analysis performed in this study revealed that many recruiters required competences from disciplines other than interaction design (e.g., strategy, business, organization, etc.). This illustrates the pressure that organizations face from the variety of technological drivers in society. One of the goals of professional practitioners within the field of interactive design is to make products more usable via the development of interactive computing systems for human use (Benyon, 2014). This requires specific and unique knowledge from a practitioner’s point of view (Huang, 2009). Expectations concerning additional knowledge (outside this area) should therefore be realistic. Areas such as strategy, branding, marketing, and business development belong to work positions other than pure interaction design. In light of the fact that users today are increasingly more demanding and experienced, great designer skills are of particular importance.

As opposed to other research on work ads (e.g., Cullen, 2004), the present study provides survey data that shed light on the competences (typically applicable to some of the work ads) that interaction designers actually have. Analysis of the survey data revealed that people working as interaction designers, as well as those few respondents in our sample who were studying interaction design, had varied
backgrounds, education levels, and skills; however, they did not have a shared discipline or common set of skills or competences. This situation illustrates how a historically recent profession such as interaction design was created by institutional demand to meet the requirements that followed the introduction and further development of the Internet. Those findings might be a result of the inconsistent use of the work title “interaction designer,” which to some extent can be seen as a mismatch between how we, in theory, define the role and importance of interaction design skills and how the phenomenon actually occurs in practice within the industry. An interaction designer needs to have design expertise, in addition to so much more, which ideally should be covered by other work positions and/or members of the design team as well (Borchers, 2001). One of the consequences of this mismatch is that educational institutions might not be able to offer programs that correspond with workforce requirements because a bachelor’s degree (in most cases) takes three years to complete, with the addition of two years for a master’s degree.

Accordingly, the development of bachelor’s and master’s degrees is time consuming and requires up-to-date knowledge about industrial needs. Moreover, it requires approval from ministries or other government agencies, which is in turn also demanding and time consuming. Most likely, changes in study programs take more time than in, for example, IT companies, because of issues related to quality assurance, decision making (e.g., course content, administration, use of software/hardware), key resources (e.g., lectures, contacts with the industry) to be recruited, and so forth. Furthermore, the interaction design field is changing rapidly and, from an educational point of view, it might be hard to continuously enact quick changes and adapt to the industry. Western society has undergone a variety of economic changes over the past hundred years, and the service sector now generates more wealth than the manufacturing sector (Dekas et al., 2013). Ten years ago, 72% of the US workforce was employed in some form of white-collar or service work (an increase of 28% since 1940) (Barley, 1996b). Professions in the twenty-first century, however, will bring fundamental changes to the way the “practical expertise” of specialists is made available in society (Susskind & Susskind, 2015). Designing exceptional systems is already a critical goal, and will become more important in the coming years. Technological developments are outpacing organizational changes, which risks creating a gap between what the industry wants and needs and what educational institutions are able to offer. There is also a need to bridge the gap between HCI research and interaction design performance in order to influence practice (Goodman, Stolterman, & Wakkary, 2011). Interaction design students need to put pressure on educational institutions to minimize this knowledge gap. Those who work as interaction designers could benefit from joining various online MOOC programs (Massive Open Online Courses) in order to keep pace with the industry’s constantly changing demands. Lastly, the industry needs to make sure that they offer their staff opportunities for personal development and access to internal programs.

7. CONCLUSION

This research paper has explored the skills and competences interaction designers actually have versus those expected and called for by organizations in their recruitment ads. Overall, this study demonstrated a mismatch between the skills and competences of interaction designers and those expected by organizations. Grounded in the findings of this study, the following concluding remarks can be made:

First, companies and practitioners should be more realistic in their expectations of what competences and skills interaction designers should have. A solution might be closer collaboration between interaction designers and companies, internships, external lectures from the industry, and workshops. Recruiters should also explicitly formulate (1) the required competence the designer should have, (2) the work tasks the designer will be expected to complete, and (3) the education level the designer should have to meet their companies’ expectations. Second, recruiters’ notions of what to expect from interaction designers are not always covered in educational programs, depending on the type of education and the specific educational organization. Recruiters should therefore be aware of this discrepancy and not expect all interaction designers to be experts in technical issues, programming, design tasks, marketing, strategy, public relations (branding), and so on. Rather, their expectations should be both bounded and sharpened. Third, our study highlighted the importance of educators keeping up-to-date with both their field and societal changes, so that they can better educate students and meet current societal and industrial demands.
This study is not without its limitations. We only analyzed work ads from recruiters and survey data from interaction designers. Further research should include an analysis of the different interaction design programs offered by educational institutions. More research should also be conducted that includes data at a national level, so that it will be possible to compare tendencies between countries. In addition, future studies could benefit from qualitative interviews, emphasizing the present topic, with interaction designers and companies offering such a position, as well as their expectations and individual needs in terms of the types of work duties interaction designers are expected to perform. In sum, there is great potential for additional studies on interaction design in practice and the educational programs offered to teach it.

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