



The use of internships to foster employability, enterprise and entrepreneurship in the IT sector

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Review

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Introduction

Throughout Higher Education (HE) there is widespread acknowledgement that discipline-specific education is only a part of the responsibility institutions have in terms of delivery to students (e.g., Galloway and Brown, 2002). Additional components sought by employers in a competitive economy, and therefore by students who seek to gain employment after completion of studies, are employability and enterprise (Richardson and Hynes, 2008). As Sewell and Dacre Pool (2010) point out though, what is sought from employability and enterprise in graduates is not clear as the terms themselves are opaque and overlap considerably with each other, and with other concepts such as entrepreneurship, tacit skills and generic skills. There is little doubt though that all of these involve applied competencies that can be related to the world of work. As such, there is much rhetoric about the usefulness of workplace experience, based on the now well-established identification of experiential learning as the most effective means by which (particularly applied) skills are developed (Laurillard, 1993; Miller, 2002). In industries such as IT, a capable, creative and enterprising personnel base are said to be critical to organisational and sectoral development since these foster the potential for innovation and opportunity (Ratcliffe, 2009). For these reasons, and their potential in terms of economic development and national competitiveness in global industries, governments also are keen to encourage, and often support, work placements for students to improve employability and enterprise in technology sectors (e.g., BIS, 2011 in the UK).

The current paper reports a study of the usefulness of work placements for IT students and for employers in the IT sector in the UK. Within a qualitative methodological framework, using both surveys and interviews, the study presents findings about how placements are perceived from students' perspectives and from the perspectives of employers. The paper commences with a review of the literature on employment in the IT industry, followed by a discussion of employability, enterprise and entrepreneurship and their role in the IT sector. Following an explanation of the methodology used for the empirical study, findings relating to three research questions are presented. The paper concludes with a discussion on implications for

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3 employability, enterprise and entrepreneurship as they relate to IT educators,
4 internship providers and the IT sector.
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8 **Employment in the UK IT Industry**

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10 Griffiths and Moore (2010) report that the UK IT industry is predicted to continue to
11 grow. Similar claims of the particular robustness of the IT sector are made by industry
12 and professional IT bodies; the UK IT industry body, e-skills, claims that the sector is
13 better equipped to prevail and continue to grow and to provide high quality
14 employment, even in recession, relative to other industries (Ratcliffe, 2009).
15 Conversely, Bergvall-Kareborn and Howcroft (2011) claim that the value and
16 employment potential of the IT industry is hyperbole. At the same time, there is some
17 evidence that the landscape for the IT industry is changing; in the UK specifically,
18 Marks and Huzzard (2010) find a reduction in foreign direct investment (FDI) of
19 global players and a corresponding increase in small independent firms. In this new
20 context, post FDI withdrawal, they find also lower amounts of inter-firm migration
21 amongst employees and increased contract work. Bergvall-Kareborn and Howcroft
22 (2011) concur, adding that while it prevails as a major global industry, the IT sector is
23 increasingly characterised by short-term contracts and outsourcing. Baldry, et al.
24 (2007) divide careers in the IT industry into those that are 'organisational' (i.e., within
25 organisations) and 'horizontal-boundaryless' (those with a more portfolio
26 characterisation, including periods of self-employment). These conditions comprise a
27 precarious employment environment for the IT specialist whose career is increasingly
28 likely to require that they work as what Bergvall-Kareborn and Howcroft (2011, p3)
29 call "self-employed employees" or "entreploees".
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45 If contract work and self-employment are increasingly the norm, those working in the
46 IT industry, including new entrants, are likely to require the experience, skills and
47 networks to drive such a career. Therein lies a strong rationale for the development of
48 non-technical skills in the IT industry: if we are to 'grow our own' in order that
49 national sectors can innovate and compete in a global industry, and if we are to expect
50 that a proportion of the IT workforce will continue to and increasingly comprise
51 individuals who must drive their own careers through contracts and periods of self-
52 employment, we have to make available to IT students the opportunity to develop
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3 commercial and customer-facing skills in addition to technical abilities. This has clear
4 implications for universities and other educators of IT professionals.
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7 8 **Employability, enterprise, entrepreneurship**

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10 Bridges (1994) notes that employability is hard to quantify. Despite this, various
11 attempts have been made: Moreland (2006, p7) claims it comprises “a set of skills,
12 knowledge and personal attributes that make an individual more likely to secure and
13 be successful in their chosen occupation to the benefit of themselves, the workforce,
14 the community and the economy” (also Dacre Pool and Sewell, 2007). The inferred
15 skills include, according to Sewell and Dacre Pool (2010, p91-2), creativity,
16 adaptability, independent working, working in a team, ability to manage others,
17 communication skills, time management, ability to use new technologies, and
18 commercial awareness. These can be roughly split into explicit skills, such as those
19 involving technology, and tacit skills, such as communication and ability to work
20 effectively in a team.
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30 Enterprise is similarly hard to define, though again, various attempts are observable:
31 Rae (2007, p610) defines it as “the skills, knowledge and attributes needed to apply
32 creative ideas and innovations to practical situations”. He includes almost all of the
33 skills identified as referring to employability, such as creativity and independence, but
34 includes others also, such as identifying opportunities and leadership. Rae (ibid) notes
35 the similarity between enterprise skills and employability skills and concedes that
36 they are highly overlapping; indeed, he advocates the use of enterprise teaching in
37 universities as a means of developing employability skills. While agreeing with this,
38 Sewell and Dacre Pool (2010, p.91) argue that the further concept of
39 ‘entrepreneurship’ is distinct: they refer to it as involving enterprise or employability
40 “but also something extra”, namely “the ability to generate creative ideas, take risks in
41 implementing them and be motivated to get them off the ground”. In this way, in line
42 with classic Knightian approaches to entrepreneurship (Knight, 1921), Sewell and
43 Dacre Pool note risk as a fundamental component of entrepreneurship. Risk-taking,
44 they claim, is not a quality attractive to employers; the idea that an individual may
45 take risks with their capital and resources is unappealing. However, the
46 entrepreneurship literature consistently cites affordance of behaviours associated with
47 entrepreneurship amongst employees, including risk-taking, as one of the components
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3 that distinguishes growth-oriented and high-performing firms from others (e.g.,
4 Miller, 1983; Lumpkin and Dess, 1996). Moreover, it leads us to a further
5 complicating and overlapping concept, intrapreneurship.
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10 Antoncic and Hisrich (2003, p7) define intrapreneurship as “entrepreneurship in
11 existing organisations”. Within organisations entrepreneurship is associated with risk,
12 innovation, proactivity (Miller, 1983), competitiveness and autonomy (Lumpkin and
13 Dess, 1996), and has long been reported as a feature of high performing firms (e.g.,
14 Robertson and Collins, 2003). This being the case, we are led, full circle, to the idea
15 that what innovation-driven industries, such as IT, require in order to develop is
16 innovation and entrepreneurial growth within existing organisations, as well as the
17 creation of new organisations and organisational forms. In order for a firm to achieve
18 entrepreneurship it must have within its human resources people with the skills and
19 abilities to act entrepreneurially (Wicklund and Shepherd, 2005). Thus, if
20 employability and enterprise already overlap, then these also overlap with the
21 concepts of entrepreneurship and intrapreneurship.
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31 Following Nabi and Holden (2008), Sewell and Dacre Pool (2010) propose a
32 continuum in terms of skills and attributes ranging from employability skills through
33 enterprise skills to entrepreneurship. There is no reason to assume that one’s place on
34 this skills-continuum is static; the aim of education is to develop skills and those
35 associated with Sewell and Dacre Pool’s employability to entrepreneurship continuum
36 are no different from any other kind of skills in this respect. Certainly, studies of the
37 impact of enterprise and entrepreneurship education, such as Galloway and Brown,
38 (2002) have reported skills development; in effect movement along Sewell and Dacre
39 Pool’s hypothesised continuum.
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48 For students following a degree programme including IT and/or Computer Science,
49 we might assume that explicit skills such as technology skills are included in
50 curricula. For those engaged in programmes that include Business Studies, explicit
51 skills taught might also include Finance or Management skills. The extent to which
52 tacit skills, such as creativity and communication, may be developed during degree
53 study is likely to vary by university however, depending on how highly the
54 dissemination of employability skills are prioritised and the extent to which faculty
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3 practice includes these in their curricular and non-curricular delivery. Certainly, in the
4 UK, universities are encouraged by government to include employability as an
5 essential component of programmes, in particular including the application of skills in
6 real-life contexts, and as a result many UK universities have put employability at the
7 top of their agendas (BIS, 2011). However, university curricula can only go so far in
8 terms of skills development, be that the application of explicit skills or the
9 development of tacit skills. Fugate, et al. (2004) claim that experience and in-work
10 learning will develop skills further.
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18 **The role and value of student internships in the IT sector**

19 Providing IT students with placements is argued to benefit the IT sector in three ways.
20 First, it affords development of business and commercial skills, or employability,
21 amongst participants. Second, it can expose participants to an entrepreneurial
22 environment in which they may become better equipped to consider entrepreneurship
23 or at least have appropriate skills development to afford them effectiveness in periods
24 of self-employment. Lastly, it provides for firms and the sector as a whole, a new
25 generation of highly technically skilled knowledge workers with practical market
26 experience. The hypotheses for each of these perspectives is detailed below.
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34 *Employability*

35 Fugate et al. (2004) contend that technical skills alone are no longer enough for
36 graduates entering the IT industry. Richardson and Hynes (2008) note the contribution
37 placements can make to the employability of IT graduates; they claim that this has
38 become so important that it is increasingly likely that those who have “strong
39 technical abilities but little practical experience are losing out on potential jobs”
40 (p190). At the same time, entry level employment in the IT sector in Western
41 countries has reduced as a result of ‘offshoring’ – the movement of many ‘first
42 destination’ jobs in support or basic programming abroad to countries such as India,
43 where there is a cheaper supply of IT graduates with strong technical skills (Ratcliffe,
44 2009). The implication for UK IT graduates is a reduction in entry level long term
45 contracts leading to a highly competitive (first) employment market. The need for
46 employability skills that can be used to market oneself to, and perform in, firms has
47 thus never been greater.
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3 In response to these assertions, the paper seeks to investigate Research Question 1: Do
4 work placements develop useful employability skills that will better prepare students
5 for the IT workplace?
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8 9 10 *Entrepreneurship*

11 Following on from this, exposure to entrepreneurship education for students of
12 technical subjects is advocated in the entrepreneurship literature (e.g., Keogh and
13 Galloway, 2004), including practical learning through placements (Richardson and
14 Hynes, 2008). The rationale for this is two-fold. First, as noted earlier in this paper,
15 structural change in the IT sector has redefined how employment is managed for
16 many, whereby responsibility for employment and professional development
17 increasingly rests with individuals, leading to a subsequent increase in portfolio
18 careers. While this has been reported extensively in the employment literature in
19 recent years (e.g., Baldry, et al. 2007; Marks and Huzzard, 2010; Bergvall-Kareborn
20 and Howcroft, 2011), it is also beginning to emerge in the entrepreneurship literature:
21 in their study of the IT sector, Robert, et al. (2009, p 1) find a “surprising number of
22 necessity entrepreneurs” (necessity being defined as self employment or business
23 creation in the absence of suitable employment alternatives). Thus, placement
24 experience in organisations is important as in order to sell oneself as a project
25 contractor or self-employed, one must be able to draw upon real-world experience of
26 both technical and commercial aspects of the industry to appear credible.
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39 The second issue in terms of entrepreneurship is that placements can afford students
40 the skills and training required for opportunity identification and pursuit within their
41 technical specialism. Placements can enhance this by providing experiences of
42 working in a commercial organisation and being exposed to the IT specialism in a
43 market context, from which the ability to spot and pursue opportunities may develop.
44 Potentially, at some point in an IT career, this may spawn the critical innovative new
45 firms from which sector growth and employment may develop.
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53 From the perspective of the individual, entrepreneurship, whether necessity- or
54 opportunity-driven, creates a reasonable alternative to organisational employment.
55 Thus Research Question 2 is generated: Do work placements improve students’
56 abilities and attitudes to self employment and business creation in the IT sector?
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Industrial Competitiveness

In their study of the IT sector in Canada, Lucas, et al. (2009) compare the innovativeness and success of different IT clusters. They conclude that cluster success (in terms of innovation, growth and market share for firms) is best achieved within what they call a ‘thick’ environment – one where new and established organisations of different sizes and competencies coexist, along with institutional and support organisations, and research organisations including universities. The universities in particular serve not only as sources of innovation through knowledge exchange activities, but also as sources of new labour. Of this latter, they claim:

“the movement of students back and forth to industry through coop placements, as well as permanent hiring upon graduation, all serve as conduits of knowledge that keep firms at the leading edge of innovations and keep universities relevant to local industry” (Lucas, et al. 2009, p200).

Thus, along with evidence that placements can enhance IT graduates’ chances of and preparation for employment, and even entrepreneurship, there is a strong argument that placements are highly valuable to industry also. The reasoning here is that placement experience can develop technical specialists for the commercial environment, and these practically experienced students will, in time, comprise for employers a recruitment pool better equipped to contribute value to organisations through the dissemination of technical knowledge, market and commercial understanding, and innovative ideas (McQuaid, 2002). The sector as a whole is enhanced in the same way, as firms continue to innovate and compete, and as opportunities to create new products and services, and new organisations, emerge and are acted upon by those with the requisite skills and ambitions to do so. From these arguments, Research Question 3 is generated: What are the perceived benefits of student internships to the IT industry?

Methodology

To investigate the three research questions identified, the paper provides a qualitative analysis of data produced to examine the practice and effectiveness of a student internship scheme provided by e-skills, the UK industry body for the IT sector.

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3 Qualitative analysis was considered most appropriate for the current study because it
4 allows for results that reflect the positions and viewpoints of those being studied
5 (Bryman, 1988) and includes therefore that which cannot be quantified or where
6 being quantified does not provide any meaningful insight (Cassell and Symon, 1994).
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8 While it can be more difficult to generalise results with qualitative methods than in
9 studies where quantitative methods have been used, Stake (1995, p.40) claims that
10 through qualitative research we gain vicarious “experiential understanding” of a
11 subject. The uniqueness of the experiences of those being studied in social science
12 research is where a depth of understanding can be achieved, through analysis of
13 commonality and divergence of human or social (or business) experience. Since the
14 current paper aims to provide information and understanding of the value and
15 experience of internships from the perspectives both of interns and of employers,
16 qualitative data gathering is thus critical as it may afford an understanding of the
17 perceptions and realities of the agents involved, and can link these to extant
18 knowledge about the environment in which they exist.
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29 *The Study*

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31 E-skills, developed in 2010 a student placement programme, involving a substantial
32 and growing number of UK universities, from which students of Computing, IT,
33 Business and other disciplines have been placed in an organisation. These
34 organisations include large firms such as IBM and P&G, which typically take several
35 students at a time, to smaller and newer organisations that may take only one student.
36 Organisations range from specialist IT firms to non-IT organisations in the private,
37 public and third sectors with an IT department or IT support function. All placements
38 are paid and usually last one year (though shorter term internships are also available).
39 Placements are available only to current students during their degree programmes.
40 The focus of each placement is based on the specialism required by the organisation,
41 and as such they provide both technical skills practice and development, as well as
42 ‘employability’ skills development. E-skills (2010) summarise that the value of the
43 internships scheme is to afford students “a rich blend of business, interpersonal and
44 technical skills”.
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56 During September 2011, using data provided by e-skills, the authors conducted a
57 survey of 100 students who have completed a placement and 120 employers who have
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3 provided at least one during the period 2010-2011. Forty-six responses to the interns'
4 survey were obtained; 57 to the employers' survey. Both the employers' and interns'
5 surveys were designed in such a way as to facilitate as much qualitative data as is
6 reasonably possible with such an instrument. Respondents were invited to comment at
7 length on their opinions and experiences of various pertinent issues.
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13 Following the surveys, one to one telephone or in-person interviews were conducted
14 in order to afford a deeper understanding of the role and value of the e-skills
15 internships from both interns' and employers' perspectives. Five representatives from
16 organisations that had provided an internship and six participants who had completed
17 one agreed to be interviewed. For each, an interview guide was used to encourage free
18 conversation about the topic and related emergent issues. Summaries of the interview
19 participants are given in Tables 1 and 2. As per appropriate practice in interview-
20 based research, all conversations were recorded and transcribed verbatim. Following
21 Miles and Huberman (1994), analysis was conducted in the first instance by each of
22 the three researchers individually, and emerging themes were identified by consensus.
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31 **Table 1 here**

32 **Table 2 here**

33 **Findings**

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37 *RQ1. Do work placements develop useful employability skills that will better prepare*
38 *students for the IT workplace?*
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43 **Figure 1 here**

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46 The data presented in Figure 1 is included to provide a general context to the
47 following qualitative results. The figure shows responses from interns about whether
48 skills have been developed by the placement experience and by the university
49 experience. It also shows responses from employers about whether placements
50 develop specific skills. Figure 1 illustrates that students perceive that both their
51 internship and their university studies have contributed to their skills development,
52 and that while this is marked for explicit technical skills, it is also particularly
53 pertinent for the more tacit skills such as communications and team-working.
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3 Similarly, Figure 1 shows that employers, by and large, are consistent in their
4 reporting of perceptions of skills developed by internships. Of course these data are
5 descriptive only and statistical significance cannot be determined. However, the
6 overall inference about skills often categorised as soft, transferrable, or relating to
7 employability, such as communication, is that in-practice development is perceived as
8 beneficial. This is supported by interview data:
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14 *Its about understanding how a business functions, the demands, the kind of*
15 *agreements that have to be met, certainly meeting people, learning about diversity, so*
16 *working with people from all around the world, how to interact in online meetings*
17 *and then face to face meetings (intern interview 1).*
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23 *The number one is definitely communication. Aside from that, being able to work in a*
24 *team and being outgoing and that type of thing. All those kind of soft skills, those are*
25 *the ones that are most improved (intern interview 2).*
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29 *You learn how to be with a customer, how you be in a relationship with them, how to*
30 *engage them (intern interview 3).*
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35 The development of explicit technical skills in real contexts was cited as another
36 valuable function of internships by both interns and employers. For example,
37 comments in the surveys such as the following were common:
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41 *working in a real project allowed me to put skills from my degree into practice*
42 *(survey intern 1D4).*
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46 *“I transferred uni-taught skills and techniques to real life business”(survey intern*
47 *1D20).*
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51 *They always seem to say that they learnt more with us in one year than in the first two*
52 *years of their degree course (survey employer, 1D51).*
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56 Findings from the interviews with both interns and employers corroborate these. For
57 example, Employer B claims the value of the internships are that they afford *the*
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3 ability to recognise the relevance of what they are learning in the classroom and how
4 it relates to the commercial world. Similarly, Intern Interviewees 3 and 4 identified
5 that they developed competence in programming languages that had not been taught
6 in university, thereby adding to their technical skills base.
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11 So the value of internships appear to be perceived to be about both tacit and explicit
12 skills development; technical, market/workplace, and transferable. As Intern
13 Interviewee 1 puts it: *its about the technical know-how as well as how the business*
14 *works.*
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19 Less often identified as valuable for skills development was the role of universities.
20 Despite reportage in Figure 1, the qualitative data indicates some perceptions of the
21 limited contribution the universities may be making to skills development. This is
22 particularly pertinent in terms of employability skills. For example, Intern Interviewee
23 4 claimed:
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29 *I don't think I learned anything about work really. Its theoretical stuff, which is nice*
30 *to know, but it doesn't have much of an impact on my day to day work... lecturers, you*
31 *know, don't have much real life experience and are not overly useful.*
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36 From the employers' perspectives, there was support for this. For example, when
37 asked how prepared universities make students for work in the IT sector, employer
38 interviewees' responses include: *it was quite shocking that people...are quite*
39 *incapable. I'm not overly impressed (A); I don't think they are prepared (B); its*
40 *amazing how ill-prepared some graduates are (D). Employer E elaborates:*
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46 *I don't think they're thinking about what employers need. I mean they're thinking*
47 *about, you know, 'I'm a maths lecturer, this is what we do as mathematicians' not*
48 *'what do we need for the 21st century'...They need to have an understanding of the*
49 *world of work.*
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55 The application of employability skills and those required to operate in a working
56 environment emerged as the main deficiencies. Even those environments that are not
57 commercial are regarded as customer oriented as the IT function in many
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3 organisations is to service staff or project needs. Customer-facing skills and skills
4 related to these, especially confidence and communication, were therefore high on the
5 agendas of many participants in the research, and they were cited regularly as those
6 that were developed by internships. One survey respondent summarises:
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11 *They have improved in all areas and most considerably in their communication and*
12 *customer service skills and their confidence has been increased (1D28).*
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16 Improvements in both explicit and tacit skills has, according to all responses to the
17 interns' and employers' surveys and the interviewees, improved students'
18 employability. In fact, comments made by employers relating to interviews for
19 graduate positions bear this out:
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24 *Internships are actually in this day and age vitally important for employability and*
25 *I've commented to other staff that when you interview you do actually notice a*
26 *difference in the two...the other people on the panel were gobsmacked at the*
27 *difference (employer interview D).*
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33 *There is a distinct difference in the performance at interview between graduates that*
34 *have completed a placement year compared to those that have not (survey employer*
35 *1D13).*
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40 *I think that I would be very reluctant to hire a person who has come out of university*
41 *without an internship. We would either hire a person who has done an internship or*
42 *who has built up some experience in proper work basically (employer interview A).*
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46 Similarly, all six interns interviewed claimed that their internship had enhanced their
47 employability; indeed, Interviewees 1 and 2 mentioned that their internships had made
48 a contribution to successfully securing graduate employment, and Interviewees 4 and
49 5 were re-employed as graduates by the organisations in which they had done their
50 internships. Further support for this includes the interview statements:
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56 *I think the main benefit really was that when applying and having interviews ... and*
57 *on your CV and cover letter having actually other things to write about. Everybody*
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3 *applying is going to have, you know, 'I did my degree', 'I got good marks' ... then like*
4 *if you've actually been to a place for a year you can actually say, 'well I also*
5 *improved my communication skills and there were tough situations that I had to deal*
6 *with' (intern interview 2).*
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11 *I'd done plenty of technical things at work [internship] which were of interest to some*
12 *companies (intern interview 4).*
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17 Thus, one of the most commonly cited benefit of placements concerned the
18 opportunity to experience the world of work and the personal development required
19 for that. Employer interviewee B summarises:
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23 *I think they all grow up... They all come in quite young and naïve about things. I think*
24 *its real exposure to what working in an organisation is like and I think it helps them*
25 *work out where they ought to go with their future careers. Sometimes they come into*
26 *this job thinking this is great and sometimes they do leave thinking this is not for me.*
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31 In fact, this idea that placements can identify for students that they are ill-suited to a
32 specific IT career was mentioned surprisingly frequently by both interns and
33 employers. As an outcome, this is no less impactful to an individual than skills
34 development, as pursuing a career can take considerable resources and time. The
35 usefulness of internships in informing students about what they are and are not suited
36 to is highly valuable for a group who start working life with unprecedented levels of
37 debt in a volatile employment market.
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45 *RQ2: Do work placements improve students' abilities and attitudes to self*
46 *employment and business creation in the IT sector.*
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50 Results relating to the effects of internships on students' attitudes to and ambitions for
51 self employment and business creation were limited. While, as reported above,
52 employability skills were seen as vital, much less emphasis was placed by both
53 students and employers on entrepreneurship and enterprise skills. In the interns'
54 survey only eight of the 46 respondents had received any entrepreneurship education
55 as part of their degree study, and as noted in Figure 1, a relatively few identified that
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3 entrepreneurial skills were developed at university or in internships. Similarly, in the
4 employers' survey, only seven of the 57 respondents claimed that entrepreneurial
5 skills were developed (12%). Admittedly, relatively few of the employers who
6 responded to the survey claimed to be owner-managers, and as such they may not
7 perceive their role to be one where entrepreneurship, as an independent form of
8 employment, might be encouraged. The only one owner-manager survey respondent
9 did claim that *internships ignite the entrepreneurial spirit when they see others*
10 *starting businesses and making them successful* (survey employer, 1D11).
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18 Despite this though, only two respondents to the intern's survey identified that they
19 were interested in starting a business, and of these one stated: *I am interested in*
20 *starting my own business, but I do not believe that I have the expertise and knowledge*
21 *required to succeed at this stage in my life* (survey intern 4C20). Little can be
22 extrapolated from this: it may be that this respondent requires further industrial or
23 commercial experience before venturing on his own, or it may reflect a lack of
24 entrepreneurial skills and attitude development throughout the educational experience.
25 Either way, it is the rareness of responses that acknowledge entrepreneurship as an
26 employment or career possibility that is most concerning. This is particularly pertinent
27 insofar as one of the intern interviewees is, in fact, now employed on a contractual
28 basis to the firm in which he did his internship (see Table 2), but he does not consider
29 himself to be self-employed. Similarly, in the interns' survey data one respondent
30 identifies that *my experience of work has been built through working for myself, a*
31 *small organisation and also a multinational corporate* (survey intern 3C9). With an
32 increasing amount of outsourcing of IT work to contractors, and an increased
33 likelihood that entrants to the IT sector will find themselves self-employed at some
34 stage in their careers (like intern interviewee 5 and survey intern 3C9), we would
35 expect to find more acknowledgement of the importance of development of skills to
36 do this, and indeed, more evidence of acknowledgement of self-employment as an
37 employment option amongst interns and employers. In fact, there is little evidence of
38 either in the data, except for some rare mentions of the need to establish contacts and
39 networks in the industry should contract work be necessitated.
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56 *RQ 3: What are the perceived benefits of student internships to the IT industry?*
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3 Results to RQ3 were revealing in a number of ways. The common assumption that
4 interns comprise a source of cheap expertise does appear to be true. In the employers'
5 survey 18 of the 57 respondents (32%) claimed that internships were a good source of
6 labour. However, two other commonly cited reasons for employers to engage with the
7 placements scheme were to access good potential recruits for graduate jobs and to
8 provide up to date and enthusiastic input to organisations.
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12 In terms of using internships as a graduate recruitment strategy, 17 of the 57 survey
13 responses (30%) confirm this. Comments in the employers' survey include, for
14 example:
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18 *We have the ability to assess future potential employees on a year-long interview*
19 (survey employer, 1D1)
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23 *It gives us a no-risk look at individuals with a view to the graduate positions that may*
24 *become available (survey employer, 1D14).*
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28 Interview data from interns and employers supports this further:
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32 *we use placements as an extended interview (employer interview A)*
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36 *all of them have gone on to get jobs with us, its like growing our own (employer*
37 *interview E)*
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41 *the whole company's pretty much built up of old placement students....after their final*
42 *year, if they're alright, often they'll get a job (intern interview 4)*
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46 *there are two process for applying to XXX. One is an internal process...and what that*
47 *is is they reach out to the existing industrial placement students (intern interview 6).*
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52 In fact, all of the employers interviewed have recruited to graduate positions direct
53 from internships. Using internships as a recruitment mechanism is a saving in time
54 and resources in terms of recruitment spend, and is especially valuable for graduate
55 recruitment, whereby lack of experience in industry equates to higher risk for
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3 employers. Employers are able to specify the skills developed, tailor them to specific
4 organisational culture or requirements, and select those recruits who develop and
5 perform best in internship.
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10 Organisations benefit from internships in other ways also. The contributions interns
11 made, as noted by employers, include *new and fresh ideas* (survey employer, 1D1),
12 *bright new talent* (survey employer, 1D5), *enthusiasm and up to date techniques*
13 (survey employer, 1D30). Interview data includes similarly positive statements. For
14 example, Employer B claims *they do give you a fresh pair of eyes to look at*
15 *things...they do just kind of bring that breath of fresh air back into the organisation.*
16 Employer C notes that the technical expertise can be valuable also: *The kids of today,*
17 *you know, are up more with the latest technologies and the brightest ideas.*
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25 So the data suggests that the contribution interns can make to organisations is two-
26 fold, including enthusiasm and new ways of looking at things, and up to date
27 technological expertise. One survey respondent summarises:
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31 *We get a shot of creativity and fresh thinking. Interns tend to strip away the 'we must*
32 *do this because we've done it that way for 10 years' thinking and say 'well if you do*
33 *this its much simpler and gets the job done'. Some of our interns have been great at*
34 *perfecting our inductions for new staff while others have introduced technology to*
35 *areas where it was previously unheard of* (survey employer, 1D44).
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42 The contribution of interns to organisations can be extrapolated to infer contribution
43 to the IT industry generally. New ideas and alternative ways of doing things evoke
44 notions of creativity and enterprise. Specialist, cutting edge knowledge of
45 technologies in a dynamic and fast-paced sector such as IT is required for
46 organisational and industrial competitiveness. The training and experience provided
47 by internships in the IT sector, combined with university-taught technological skills
48 and knowledge, does seem to make for a valuable contribution.
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53 54 55 **Discussion**

56 The study finds that in terms of the development of employability skills, student
57 placements in the IT sector do make a strong contribution. Further, it supports the
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3 assertion of Richardson and Hynes (2008) that internships are becoming increasingly
4 important to the employability and employment prospects of IT graduates. Comments
5 from employers about how prepared IT students are for work in the IT industry are
6 concerning, however. Employers, while recognising the contribution interns can make
7 to organisations in terms of skills and expertise, are less impressed with prior
8 knowledge about and application of skills in a commercial or otherwise real-world
9 context. The inference for university IT departments is that there could be much more
10 done in terms of preparing IT and Computing students for the types of employment
11 they will be required to engage with, especially in terms of developing the more tacit
12 employability skills required by commercial and support organisations.
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21 In terms of entrepreneurship, results are even more concerning. The study
22 corroborates the extant literature (e.g., Baldry, et al., 2007; Robert, et al., 2009) by
23 finding evidence that new entrants to the IT sector are likely to spend periods of their
24 careers as self-employed. Evidence of acknowledgement of the implications of this,
25 particularly in terms of the need to develop skills and strategies for operating as self-
26 employed in the IT environment, seems to be largely absent though. The employers,
27 who by and large do not represent owner managers, do appear to be contributing
28 much value to students in terms of developing employability skills. While these skills
29 are those which are of most benefit to employers, they do appear to comprise
30 consistency and overlap with skills associated with enterprise in that enterprising and
31 customer-based orientation appear to be amongst that fostered. What the data does not
32 suggest, is that entrepreneurship, as a positive career choice or opportunity, is
33 acknowledged either by interns in the context of their futures, or by employers in the
34 context of industry development. While it is not the business of established
35 organisations to promote new firms (which may comprise competition), there is
36 implied a deficiency in expectation management of students in universities. First,
37 students appear to be neither aware of the likelihood of, nor equipped for, self-
38 employment in the form of contractual work, and second, there is no evidence in the
39 current study that there is any perception that the IT industry might provide
40 entrepreneurial opportunities other than as a set of competencies and attitudes to be
41 applied within existing organisations.
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58 **Implications and Conclusions**

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3 Results from the current study suggest that, as per the extant literature (e.g., McQuaid,
4 2002), new graduates have much to contribute to the IT sector. They also support the
5 assertion that as a means of developing people, placements make a valuable
6 contribution to preparations for employment for IT students. As a result, the value of
7 internships and a rationale for their continued availability through programmes such
8 as that provided by e-skills in the UK is supported.
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14 At the same time, the difference observed by employers in preparedness and
15 employability between those who have undertaken an internship and those who have
16 not exposes the implication that not enough is currently being done in universities to
17 prepare IT students for the realities of work in the sector. If universities have an
18 obligation to prepare students for work, the evidence here suggests that deficiencies in
19 university delivery are mitigated to some extent by internships. However, worryingly,
20 there is an absence of evidence that there is any acknowledgement that contractual
21 work has become an increasingly common destination, or that entrepreneurship within
22 the sector has a vital role to play in terms of innovation and competitiveness. Since
23 fewer than twenty per cent of the sample of interns had received entrepreneurship
24 education at university, the suggestion is that more is required at the university level
25 to promote awareness, attitudes and skills associated with the enterprise and
26 entrepreneurship ends of the employability skills continuum. This is made more
27 pertinent by the suggestion that internships are not likely to mitigate a lack of
28 entrepreneurship education in university as it is not the business of existing firms to
29 encourage or support entrepreneurial development in individual interns.
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43 The current study is cross sectional in nature, and based on responses from a limited
44 number of intern and employer informants. The suggestions emerging from the
45 research must be treated with some caution therefore. Further research might
46 investigate at a different time, or with a different IT internship scheme, whether
47 results are consistent. It would also be interesting to compare results from the current
48 study with results from studies of internships in different countries and in different
49 technical or vocational disciplines. A longitudinal study following students from
50 placements, through first entry and into established careers would also be enlightening
51 in terms of reflecting on how and where employability (and enterprise) skills are most
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3 developed, and indeed, to investigate the experiences of both employment and self-
4 employment in terms of the deployment of these skills.
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Table 1: Summary of Employer Interviewees

Interviewee	Size and type of organisation	Number of IT interns in UK in the last year	Core Business IT or not IT
A	Large international firm	1	IT
B	Large international firm	7	Not IT
C	Large international firm	20	IT
D	HE organisation	3	Not IT
E	Local public organisation	2	Not IT

Table 2: Summary of Intern Interviewees

Interviewee	Internship Organisation		Current Status
	Size and type of organisation	Core Business IT or not IT	
1	Large international firm	Not IT	Employed in IT dept as graduate
2	Large international firm	Not IT	Employed in medium sized IT firm
3	Local public organisation	Not IT	Part-time non-graduate job; not in IT
4	Small private firm	IT	Graduate employment with internship firm
5	Large international firm	Not IT	Employed as an IT contractor to internship firm.
6	Large international firm	Not IT	Employed in IT dept as graduate

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Figure 1: Use and Development of Skills

