29

Investigating the prevailing issues surrounding ICT graduate employability in South Africa: A case study of a South African university[1]

Kenneth Nwanua Ohei, University of Johannesburg, South Africa
Roelien Brink, University of Johannesburg, South Africa

ABSTRACT

Graduate unemployment is perhaps one of the most predominant problems in South Africa, as in several other countries. The intensity of unemployment within the country's economy is revealed in the constantly rising unemployment rate year after year. This has raised many unanswered questions about universities' curricula, the quality of graduates and their ability to meet employers' expectations and criteria for employment. This paper reports on the issues surrounding ICT unemployment. The study explored the problems that graduates encounter when entering the labour market and why they are not getting their desired job in their profession. A mixed methods approach was used. Findings suggest that graduate unemployment is caused by poor economic conditions. Consequently, people at all levels and qualifications struggle to get jobs, irrespective of their qualifications. Other associated causes are lack of work experience, lack of hard and soft skills and the inability of graduates to apply knowledge acquired through university study. As a result, South African youth are still vulnerable in the labour market. Higher education institutions need to play definitive roles in producing academic graduates with the relevant skills and traits, coherent knowledge and application through using work-integrated learning as best practice for improvement.

Keywords: career development and guidance, employability skills, graduate unemployment, information and communication technology (ICT), skills shortage, soft and hard skills

INTRODUCTION

Graduate unemployment in South Africa is one of the biggest challenges facing the country today. This poses a serious economic challenge to the people as well as the country, whether directly or indirectly (Baldry, 2016). Graduate employability can only be achieved through building graduates with practical and basic skills (Rogan & Reynolds, 2016; Hamilton et al., 2015).

The development of practical skills is a challenge in the ICT-related sector where it has been contended that the ICT fundamentals have been transformed and continue to change rapidly. Vinichenko et al. (2016) support the claim that talented graduates encounter challenges of a strict staff recruitment system due to its selection and assessment criteria that employers apply in terms of the work experience required from

---

graduates. They further claim that most employers are not ready to spend time and money on training young ICT professionals. In addition, some employers have probably had negative experiences when employing unskilled graduates from colleges or universities.

Zaugolnikov (2013) maintains that graduate unemployment is a worldwide problem. Vinichenko et al. (2016) argue that employers have a tendency to assume that new graduates may be incompetent. This assumption appears to prevail among senior executives. Hart and Barratt (2009) report that in the UK, senior executives of information technology (IT)/ICT organisations often refuse to employ graduates. The reasons include cultural and communication barriers; this may be attributed to their previous experiences with unskilled graduates. Nevertheless, in the UK, a high percentage of graduates secure employment immediately after they have completed their ICT qualification. A study by the Higher Education Statistics Agency revealed that about 90% of graduates found employment within six months of completing their qualification (Vinichenko et al., 2016).

Regarding the South African context, higher education institutions (HEIs) of today are experiencing radical transformation, and are not entirely ready to meet the needs and expectations of employers. While in late 1995, there were 463 000 graduates in the labour force, from 1995 to 2012, graduates entering the labour market doubled to about 1.1 million. Yet, in spite of this significant flood of graduates into the domestic labour market, the high unemployment rate for graduates remains at its peak (Van Broekhuizen & Van der Berg, 2016).

The current economic crisis and the state of the labour market in South Africa prevent the entry of graduates into the industry (Baldry, 2016). A number of students and graduates do not have the required ICT skills demanded in industry (Edayi, 2016; Baldry, 2016). This suggests that ICT courses and programmes are not producing skilled graduates across the various universities. It is an indication that there is no proper alignment between students, universities and employers in relation to viable feedback about employers' expectations and requirements for employability. Furthermore, most graduates who are employed do not work in their chosen profession (Mncayi, 2016). This paper reports on an investigation of the issues surrounding ICT graduate employability in an attempt to overcome these existing challenges.

Research questions

In view of the above, the following research questions were formulated:

- Why are graduates struggling to secure employment or their desired job?
- What factors cause ICT graduates to be unemployable?
- What strategic approach can address the issue of ICT graduate employability?

LITERATURE REVIEW

Academic literature was reviewed to obtain an insightful and clear description of employers' expectations. The root causes of ICT graduate unemployment and challenges that graduates face when entering the employment market were identified.

The concept of 'unemployment' may be defined as being idle and not being adequately employed or utilised in terms of productivity. In addition, with reference to the South African labour market, unemployment may be described as the inability of a student/graduate who is deemed appropriate or capable, eligible and able to work to secure or find employment. Underemployed refers to a student/graduate working below capacity or not fully absorbed or utilised to maximise production (Baldry, 2016; Van Broekhuizen & Van der Berg, 2016).

HEIs have a tendency to concentrate largely on research and innovation, building on strong academic reputations, lifelong learning and strengthening university-business collaborations and connections. They also focus on society and social accountability and on creating a competitive edge over their rivals. This generates sustainable competitive advantage (Stukalina, 2018). On the other hand, they are not producing highly skilled graduates that are able to take up appropriate employment. Parents and graduates expect a better return on their investment in HEIs in terms of both educational value and employability, as the transition from HEI to global industries or the labour market can be problematic (Stukalina, 2018).

Mckenzie, Coldwell-Neilson and Palmer (2017) and Mutula and Van Brakel (2007) assert that graduating ICT students in computer science and software engineering do not always have the required employability skills, aptitudes, or knowledge-based skills when given the opportunity in the ICT industry. This is a hindrance that can limit the productivity of newly employed graduates, or even stop them from entering the industry. Mckenzie et al. (2017) hold that it is even more difficult and complex for ICT graduates to change job roles in the IT industry.

Hamilton et al. (2015) report that in 2014, about 39% of employers had challenges in finding sufficient ICT graduates for open positions in IT. Janz and Nichols (2010) presented a report on statistics from the US. The Agency of Labour Statistics predicted that the demand for ICT/IT professionals would continue to rise for the foreseeable future. Regrettably, investigations across several universities in the south-eastern parts of the US indicate that the number of ICT/IT core majors has decreased to a point that the demand will not be met. This implies that the problem of employability of ICT graduates affects the globe in general, not only South Africa (Mckenzie et al., 2017). Mutula and Van Brakel in 2007 emphasised that there is a serious global shortage of highly skilled professionals and hands-on employees essential for advancing the ever-changing digital economy both in developed and developing nations.

Many other international reports, according to Mncayi (2016), reveal that some graduates have unrealistic expectations about what is required from their employers. Graduates also do not have relevant skills or career maturity that empower them to engage with their potential employers (Mckenzie et al., 2017; AIIA, 2016). It is important to highlight that the term 'career maturity' means the ability to make appropriate, decisive and suitable decisions that support an all-encompassing career choice (Mckenzie et al., 2017). Employers advise that HEIs need to engage actively to prepare graduates adequately for employment.

The process and development of employability skills not only gives graduates an advantage in building their employability profile, but also gives them confidence and support in establishing their own career capabilities and competences (Hamilton et al., 2015; Mckenzie et al., 2017). Career competences are those essential skills obtained through a specified profession, as opposed to those acquired from previous knowledge. It is also the ability of a particular student to self-guide their activities towards further skills development (Mckenzie et al., 2017). This implies that students have the obligation to reflect vigorously on their professional desires and drive, and then to build or establish their career experiences in such a way that they are not disadvantaged in the labour market but that add value to the workplace (Hamilton et al., 2015; Kirlidog et al., 2018).

South Africa has a lengthy past of marginalisation and deprivation and was renowned for being among the most unequal societies in the world. The implications and consequences of this still affect the country today (Roodt, 2018; Rogan & Reynolds, 2016). Training and education play a fundamental role in enabling graduates to escape poverty and unemployment. Unemployment in the country is perceived as a macro-economic as well as socio-economic problem due to the shortage and non-creation of jobs to cater for the up-and-coming population of graduates. Those who are currently employed are fearful of being jobless due to job insecurity and retrenchment of workers in South Africa.

In 2015, 8.4% of graduates who had a qualification higher than a matric certificate lived in poverty. A noticeable phenomenon can be observed in relation to the impact of education on employability. Statistics SA (2018) reports that the number of graduates with a tertiary qualification who were unemployed in 2017 amounted to 13%. This rose to 28% for individuals who had finished their secondary education, while unemployment among those who had some secondary education was 35%.

These statistics reflect the failure of the government to create an enabling environment for an economy that is more inclusive and creates more employment for graduates. The government has done relatively well in expanding basic services to all South Africans, but only a comparatively small margin of individuals have been able to benefit from the South African economy, which otherwise prevents many individuals from being employed. Given the expected large returns on obtaining a university degree, this early failure of the education system has massive implications for the labour market and thus for social mobility. Low quality education is, for many, a poverty trap.

The main problem in South Africa is an unequal educational system (Van der Berg & Hofmeyr, 2018). The university system has failed to produce graduates who have the required skills to take up employment in the South African labour market. The flow of producing academic graduates through the university system is slow. After six years of study, barely half the intake of undergraduate students would have completed a three- or four-year degree programme (Van der Berg & Hofmeyr, 2018).

HEI context

The ability of ICT graduates to build, mature and become accustomed to repackaging their capabilities is a fundamental aspect in employability. HEIs are considered a crucial asset that is purported to support, promote and enable students to develop their employability capabilities and prepare them for highly professional skilled employment (Abel, Deitz & Su, 2014). Those who invested in HEIs ought to benefit substantially from economic aspects and continue to benefit from them over their lifetime. With the pronounced recession and the inactive labour market, there have been reports of university graduates who are struggling to secure jobs that match their educational qualifications. New graduates are finding it increasingly difficult to secure a job, and those who are able to do so are often limited to low-wage positions. This raises disturbing questions about whether a university degree still offers avenues for graduates to find well-paying jobs (Abel et al., 2014).

Research has highlighted that the relative labour market interests of HEIs in South Africa may be on the decline (Van Broekhuizen, 2016). The decrease in graduate labour market productivity in South Africa is attributed time and time again to, among other things, the HEIs' lack of receptiveness to structural changes in the domestic economy since 1994. In an analysis of the South African discourse on joblessness among people with the highest level of educational qualification, Kraak (2010) contends that this skills mismatch has intensified in South Africa, resulting in skills shortages and adversely affecting graduate employability and subsequent labour market prospects to a greater degree than any other scholastic cohort.

Employability

Edayi (2016) and Bhorat, Mayet and Visser (2012) define employability as a set of qualities, skills, knowledge and experience that a person who wishes to participate in the labour market should possess to guarantee that the person has the competence to be productive in the workplace. It will not only benefit that particular individual, but also his/her employer and the wider economy. Pool (2017) defines employability as a set of talents, experiences, thoughtfulness and personal characteristics that distinguishes an individual, or makes that individual more likely to choose and secure a job in which they can be fulfilled and successful. The rationale is that graduates need to be well prepared and are expected to have certain generic or self-attributed qualities.

Hard and soft skills

For many companies, finding the right candidate or graduate to take up employment is about recognising a specific person who has the right skills and quality traits and is capable of fulfilling the duties of the role and ultimately adding value to the organisation's growth (Rosenberg, Heimler & Morote, 2012). Graduates may have the educational qualifications and hard skills desired to fulfil the job description, but without a combination of soft skills and other related quality traits, employers are likely to be less motivated to employ them (Edayi, 2016).

Soft skills entail reliability, intellectual ability, collaboration and teamwork, logical and problem-solving skills, generic communication skills and an appreciation of the workplace in the sense that the graduate can function proficiently (Griesel & Parker, 2009). Other related quality traits and basic skills are computer knowledge, verbal demonstration skills, practical capability, expertise in an academic field of study, and the ability to find and access information (Griesel & Parker, 2009).

Issues surrounding graduate unemployment

Van Broekhuizen (2016) points out a misalignment between theory and application through practical work and programmes at universities. University courses are based primarily on theory and have neglected the technical aspects to prepare their graduates for the workplace. Several studies show that this might be seen as a mismatch between the requirements of companies and what graduates bring to the table (Mncayi, 2016; Griesel & Parker, 2009; Livingstone, 2018). A skills mismatch occurs when the higher education system is ineffective in producing quality graduates that have the skills needed in the labour market. It also occurs when a graduate/employee has a lower skill level than is expected to function adequately in their job (Berlingieri & Erdsiek, 2012; Farooq, 2011).

Career pathway is another area of mismatch. It is often believed that a career pathway in ICT results in definite employability. This suggests that a qualification obtained in an ICT career path or any other related field influences graduates' opportunities of securing a desirable job that is in line with their profession. This is why the quality of a graduate often depends on the level of education that the institution has to offer (Edayi, 2016; Mncayi, 2016).

Edayi (2016) and Bhorat et al. (2012) found that graduates who attended historically and underprivileged institutions that were established for black South Africans have a lower chance of getting into the labour market compared to a graduate from privileged institutions that were established for whites pre-1994. This is due to a school system that promoted fragmentation, segregation through race and inequality in terms of funding for teachers, learning materials and schools (Roodt, 2018; Powell & McGrath, 2014). The apartheid education system was dissolved in 1994 and an 'independent' education system for all was created (Van Broekhuizen, 2016). Nevertheless, employers often have either a positive or a negative perception about the quality of graduates, depending on the HEI from which the qualification was attained. This influences employers' choice of candidate.

Another area of mismatch is that graduates often have high expectations that their first job will be a highly paid and a desirable position in line with their profession. They then discover that many entry-level jobs do not even come close to what they anticipated or planned (Mncayi, 2016).

METHODOLOGY

The mixed methods approach was used in this study. For the quantitative research, a questionnaire was used as the data gathering technique, focusing mainly on graduates of Applied Information Systems at the University of Johannesburg. The questionnaire was sent to a qualified statistician for verification and to ensure that the structure of the questions met ethical principles and that the participants would not encounter problems when answering the questions. Demographic, education and employment information were obtained. A probability sampling method was applied. The questionnaire targeted 400 graduates of

Applied Information Systems and 220 responses were received. The respondents were selected randomly from the university's alumni database.

For the qualitative research, structured interviews were held to collect data from a selected number of employers within ICT/IT-related organisations. The interview question guide included questions about the employer's background and employment history to establish a rapport and an atmosphere conducive to participation. The interviews were held at a location suggested by the participants. Forty companies were targeted and 25 participants gave consent to be interviewed. The dataset recoverable and useable was only 25 due to unavailability of employers. Each interview was audio recorded.

Data analysis

During data analysis, diverse software tools were employed. ATLAS.ti version 8 was employed as a qualitative data analysis instrument for analysing the interviews. The information from interviewees had to be structured, arranged and interpreted. The qualitative data gathering process delivered the primary data, which was supported by the addition of secondary data obtained from the literature study discussed previously.

The initial data analysis involved open coding and a process of defining the data, identifying categories, making summaries and accounting for every data segment (Creswell, 2015). SPSS version 22 and Microsoft Excel were used for descriptive and inferential statistics such as frequencies, tables, figures and percentages.

In line with these techniques adopted, the nested or embedded mixed methods research design was suitable for this study. This design was adopted to realise quantitative findings through qualitative means. The researchers further validated the dataset to determine whether issues of ICT graduate employability as discussed in the literature were contributing factors to graduate unemployment. Thus, a consolidation approach was used to obtain a holistic view of the data gathered from the interviews to support the quantitative findings.

Ethical and procedural issues

To ensure ethical compliance with academic research standards, permission was obtained through all appropriate ethical channels. Voluntary participation, anonymity and confidentiality were ensured throughout the study.

RESULTS, DISCUSSION AND FINDINGS

Figure 1 on gender representation shows that more males were represented in this study: 61% compared to females, 39%.

Figure 1:
Gender

61.0%   39.0%
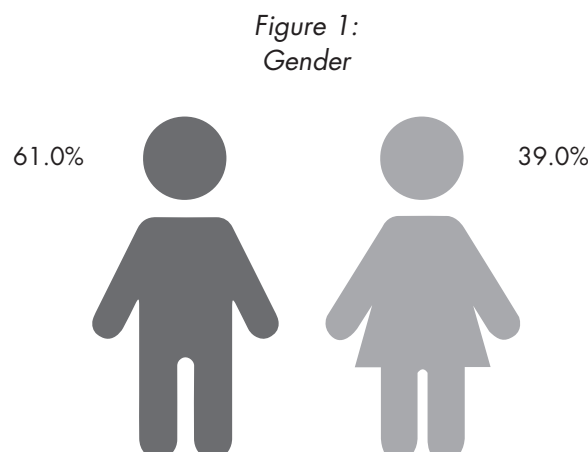
79.9% of the graduates indicated that they were African, followed by 9.2% white, 4.9% Indian/Asian, 3.7% coloured and 1.2% who did not indicate their race. The qualifications of the graduates are shown in Figure 2 below. The findings show that the majority of graduates who hold a three-year Bachelor's degree qualification was 34%, followed by those who graduated with a National Diploma qualification, 24.2%. The result also indicated that 16% of graduates continued with their studies to Honours degree, while 13% of graduates have a B.Tech degree; the rest are minorities.
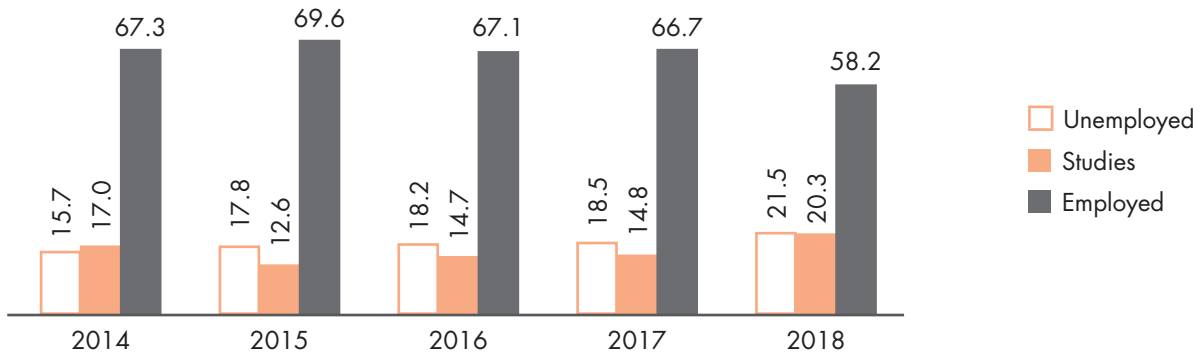
Figure 2:
Qualifications
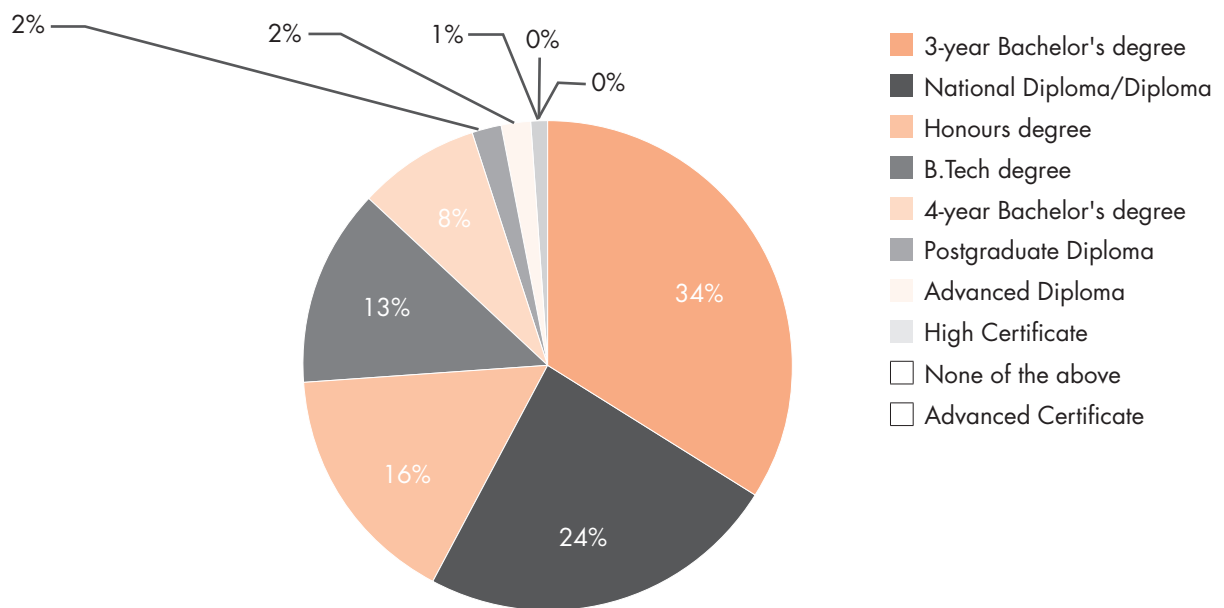
With the emergence of the Fourth Industrial Revolution, it is certain that technology will play a fundamental role in almost every aspect of our lives. According to the research conducted by Statistics SA (2018), by 2020, there will be 1.5 million new digitised jobs across the globe. About 90% of organisations/ industries currently experience a shortage of graduates with ICT skills. About 75% of educators and students feel there is a gap in their ability to meet the skills needs of the IT workforce. To prepare the talent required for the digital economy, HEIs ought to adapt quickly as the demand for IT skills is growing and evolving. It was therefore deemed relevant to determine why most ICT graduates are not able to find their ideal job placement related to their professional area and qualification, what issues are causing graduate unemployment and what strategies are available to address these challenges.

To obtain answers to these questions, graduates were asked about their employment status from 2014 to 2018. Employers were asked about their recruitment of ICT graduates. The results from both types of respondents suggest that high unemployment in a country is associated with poor economic conditions. Consequently, people at all levels and qualifications struggle to get jobs, notwithstanding their qualification. ICT graduates are struggling to find work due to the lack of job creation.

Figure 3:
Employment status of graduates

Graduates were required to indicate their employment status currently and while studying, as well as how long they had been in the job market. The results shown in Figure 3 demonstrates there was an increase in the percentage of graduates who were unemployed and a decline in graduates who were employed over the period 2014-2018.
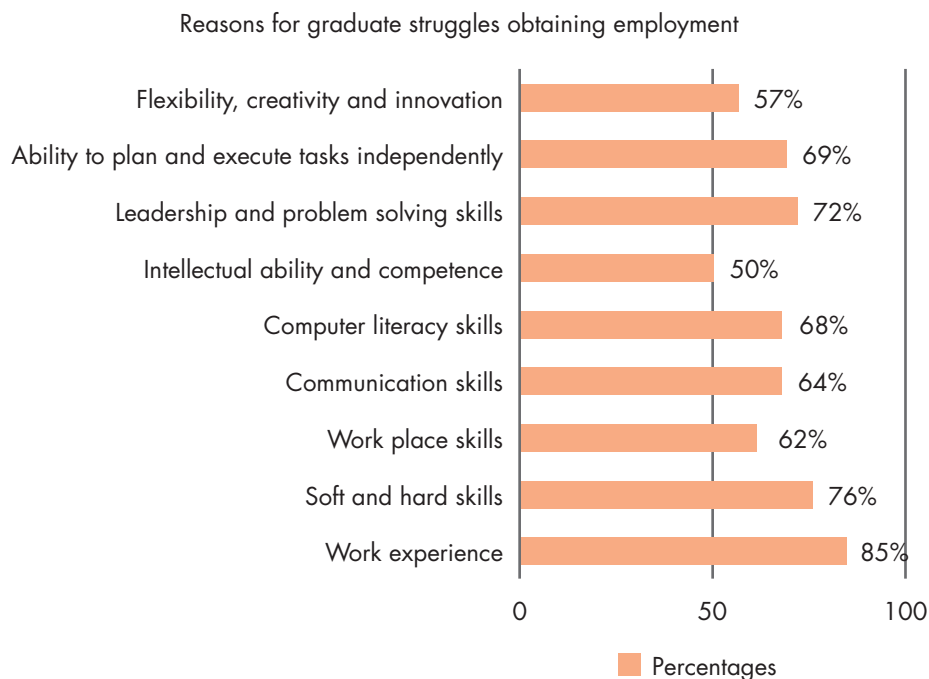
Graduates who were employed were required to indicate how long it took them to find employment within the period 2014 to 2018. Of 220 graduate respondents, 42% found employment within six months, 35% within nine months and 23% within 12 months. In support of these findings, employers maintained that the longer graduates take to find a job or desirable employment, the more likely they will work or move into professional areas which are not aligned with their career choice or area studied. They further suggested that the 'critical' period for this movement is from the fourth month onwards. The results imply that there is a need for HEIs to produce quality graduates who will create their own employability profile and work opportunities, given the lack of formal employment. Nonetheless, while this claim may serve as a hypothetical suggestion, it is certainly not going to solve all the issues of graduate employability.

Reasons why ICT graduates are unable to find their desired jobs

With the current economic crisis and issues surrounding the job market, the unemployment rate in South Africa has increased by 1.2% in the past few years (2014 and 2015), to 26.7% in 2018, which is about 6.2 million people who are unemployed (Statistics SA, 2018). The questions of where, what, when and why (4Ws) regarding employability are valid. 'Where' refers to the industry/employer; 'what' implies the kind of job position available or accessible; 'when' means duration, and 'why' refers to the challenges that graduates experience in finding employment in their desired job.

ICT graduates were required to indicate aspects that might have contributed to their struggle to secure employment. These are listed in Figure 4.

Figure 4:
Reasons for not securing jobs

Reasons for graduate struggles obtaining employment

Category	Percentage
Flexibility, creativity and innovation	57%
Ability to plan and execute tasks independently	69%
Leadership and problem solving skills	72%
Intellectual ability and competence	50%
Computer literacy skills	68%
Communication skills	64%
Work place skills	62%
Soft and hard skills	76%
Work experience	85%

The employers who participated in the study revealed that the majority of graduates who apply for jobs do not have the required working experience. They further stated that this played a major role in their appointment of employees. Notably, 85% of graduates also believed that not having work experience was a reason why they were not shortlisted.

Employers expected a graduate to have at least minimal working experience through formal or informal education in conjunction with hard and soft skills. This confirms the claims in literature that for graduates to penetrate the job market, hard and soft skills and several other ICT-related skills are fundamental for employability. Other skills that the respondents indicated as important for employability are problem-solving skills (76%), ability to plan and execute tasks independently (69%) and communication and computer literacy skills (68% each).

The results also show that graduates who had a job while studying at university were those with Honours qualifications (39.5%) and BTech degrees (39.0%). The majority of the BTech graduates worked in the same field during their studies as their current career.

In an attempt to gain a more holistic view of the impact of graduate unemployment, a comparative analysis was done between the qualifications obtained and the concepts of 'employed', 'unemployed' and 'education studies' as shown in Table 1 below.

Table 1:
Cross-tabulation of qualification vs employed, unemployed and studies

| | Main Emp. Status | All | ND | B.T | B-D 3yrs | B-D 4yrs | H |
		%	%	%	%	%	%
Emp	Permanent	22.3	16.2	31	14.7	32.6	34.6
	Contract	13.6	10.7	16.1	9.8	19	19.3
	Temporary	3.4	4	3.1	3.2	2.6	3.3
	Self-employed	1.4	1.9	1.9	0.7	2.2	1.1
	Internship/Articles	12.4	11.7	9.5	11.7	12.1	16.7
	FT work; PT student - UG	0.8	2	0	0.4	1.1	0
	FT work; PT student - PG	3.8	3.5	3.3	4.3	4.8	2.6
Unemp	Unemployed	21.5	27.6	23.4	20.8	16.8	14.4
Studies	FT-student – UG	3	7.7	0.9	2.7	0.7	0
	FT-student – PG	17.3	13.9	10.2	31	7.3	7.6
	FT-student, PT work	0.4	0.4	0	0.6	0	0.4
	Study FT; Work FT	0.2	0.2	0.7	0	0.4	0
	Study PT; No work	0.1	0.1	0	0.1	0.4	0
Total		100	100	100	100	100	100

Main Emp Status = Main employer status; Emp = Employed; Unemp = Unemployed; ND = National Diploma; B.T = BTech; B. D3yrs = 3-year bachelor's degree; B. D4yrs = 4-year bachelor's degree; H = Honours; FT = Full-time; PT = Part-time; UG = Undergraduate; PG = Postgraduate

Causes of ICT graduate unemployment

ICT courses and programmes offered to students at various universities are not producing skilled graduates as discussed above. It appears that there is no proper alignment between students, universities and employers in relation to viable feedback about employers' expectations from the graduates. The findings from the employers suggest that many ICT students and graduates do not meet the ICT skills demanded in the industry. In addition, most ICT graduates who have gained access to the labour market are not working in their desired profession.

Kirlidog et al. (2018) identify from students' perspectives important issues and reasons for the skills gap in the desired professions. They found that students had negative perceptions about ICT careers, e.g. ICT professions are uninteresting and boring, ICT jobs are not certain and unemployment rates are high. The findings in the current study are listed in the table below.

Table 2:
Causes of graduate unemployment

Causes of graduate unemployment	Graduates %
Employers' expectations, requirements and criteria	93%
Skills mismatches	85%
Skills shortage	92%
Type of education received	74%
Graduates' inability to demonstrate knowledge acquired through university	85%
Employers' perceptions and past experiences	50%
Graduates' job search attitude	69%
Work experience	85%
Quality of graduates	71%

To some extent, employers supported some of these core reasons given by students as to why they were unemployed. A few employers believed that graduates lack the ability to put into practice the techniques and skills learned at university. Others thought that graduates lacked basic work experience, or that there were no work opportunities in their field of study.

Strategies to counter ICT graduate unemployment

The ability of ICT graduates to build, mature and become accustomed to repackaging their capabilities is a fundamental aspect in employability. Respondents expressed their concerns about how unemployment affected their psychological and mental well-being. They felt that unemployment deprived them of access to the basic necessities of life, and they consequently lacked a sense of belonging and felt social unrest. One of the questions in the questionnaire and interview question guide required both graduates and employers to suggest how best these issues may be addressed. Employers suggested that universities should engage more with employers in order to align the curriculum and programme delivery with the employers' requirements. Graduates believed that the educators are not doing enough to link them with potential employers. Others believed that universities, specifically educators, need to engage with students to help develop the skills needed for employability. Very few graduates mentioned that one of the reasons for their being unemployable was simply due to their inability to develop their career profile, as opposed to relying on educators. Employers maintained that graduates ought to establish their own career capabilities and competences in preparation for the labour market.

HEIs may have to integrate work-integrated learning (WIL) as a strategy in addressing and enhancing the employability of graduates. Brink (2014) describes WIL as a programme where learning in the classroom alternates with learning in the workplace and allows for the competencies of students to be developed and nurtured by mentors. This is in line with Todd, Zydney and Keller (2011), who define cooperative education as a learning approach that integrates theory and practice by having students alternate their work and university terms. Thus, effective WIL is largely reliant on managing new information gained by the graduates, educators/HEIs and industry. Without the effective flow of information, the WIL component will be generally less useful and of minimal value to the three parties. Brink adds that the success of WIL should take into account the quality of the relationship between the three parties. This relationship is highly information dependent and information rich and the management of information will most likely be necessary in the WIL process.

The South African Council on Higher Education (2011) and Badat and Sayed (2014) state that curriculum development always has to address multiple interests and needs. It should encompass processes of designing, implementing, evaluating and adjusting programmes of study in the triad partnership.

CONCLUSION

The necessity to probe the prevailing issues surrounding ICT graduate employability in the South African context arose from the fact that most ICT graduates struggle to secure a job after completing their qualification. Those who are employed are not in their desired positions or jobs, or are in jobs that are not in line with their profession. This study is relevant given that graduate unemployability has been recognised as a global economic problem and has been classified as an impediment to social progress in South Africa. Aside from the fact that unemployability of graduates signifies a huge waste of the country's human resources, it also creates welfare loss in the sense of lower output, leading to lower income and a poor standard of living. This creates a severe economic crisis and societal consequences that affect the people themselves as well as the country.

This paper contributes significantly to the body of knowledge as new concepts and knowledge surrounding ICT graduate employability are brought to the fore. While the findings from this study reveal possible reasons why graduates are unable to find employment in line with their field of study, it also highlights the causes of ICT graduate unemployment. A possible strategic approach to dealing with ICT unemployment of graduates is to implement a well-developed and effective WIL process. The triad partners (graduates, educators/HEI and industry) must share all the relevant information to ensure that the process works and those students are prepared for employment in industry upon graduation. It is critical to ensure that the focus is on graduate employability by producing well-prepared academic individuals who enhance the employment milieu.

REFERENCES

Abel, J., Deitz, R. & Su, Y. (2014) Are recent college graduates finding good jobs? *Current Issues in Economics and Finance* 20(1) pp.1-8.

AIIA. (2016) Building productive industry-university collaboration in ICT. http://www.chiefscientist.gov.au/2016/05/communique-building-productive-industry-university-collaboration-in-ict/ (Accessed 23 August 2017).

Badat, S. & Sayed, Y. (2014) Post-1994 South African education: The challenge of social justice. *The ANNALS of the American Academy of Political and Social Science* 652(1) pp.127-148.

Baldry, K. (2016) Graduate unemployment in South Africa: Social inequality reproduced. *Journal of Education and Work* 29(7) pp.788-812.

Berlingieri, F. & Erdsiek, D. (2012) How relevant is job mismatch for German graduates? *ZEW-Centre for European Economic Research Discussion Paper* (12-075) http://dx.doi.org/10.2139/ssrn.217904

Bhorat, H., Mayet, N. & Visser, M. (2012) *Student graduation, labour market destinations and employment earnings*. Development Policy Research Unit. Pretoria: Human Sciences Research Council Press.

Brink, R. (2014) *An information management framework for the work-integrated learning process*. Doctoral dissertation. University of Johannesburg, South Africa.

Council on Higher Education. (2011) Work-integrated learning: Good practice guide. *Higher Education Monitor* (12) pp.1-82.

Creswell, J.W. (2015) *A concise introduction to mixed methods research*. Thousand Oaks, CA: Sage.

Edayi, J. (2016) *Constraints to graduate employment in the city of Johannesburg, South Africa*. Doctoral dissertation. University of Witwatersrand, South Africa.

Farooq, S. (2011) Mismatch between education and occupation: A case study of Pakistani graduates. *The Pakistan Development Review* 50(4) pp.531-552.

Griesel, H. & Parker, B. (2009) *Graduate attributes: A baseline study on South African graduates from the perspective of employers*. Pretoria: Higher Education South Africa.

Hamilton, M., Carbone, A., Gonsalvez, C. & Jollands, M. (2015) Breakfast with ICT employers: What do they want to see in our graduates. *Proceedings of the 17th Australasian Computing Education Conference* (ACE 2015) 27(1) pp.29-36.

Hart, T. & Barratt, P. (2009) The employment of graduates within small and medium sized firms in England. *People, Place and Policy Online* 3(1) pp.1-15.

Janz, B.D. & Nichols, E.L. (2010) Meeting the demand for IT employees: Can career choice be managed? *Proceedings of the 2010 Special Interest Group on Management Information System's 48th Annual Conference on Computer Personnel Research* pp.8-14.

Kirlidog, M., Van der Vyver, C., Zeeman, M. & Coetzee, W. (2018) Unfulfilled need: Reasons for insufficient ICT skills in South Africa. *Information Development* 34(1) pp.5-19.

Kraak, A. (2010) The collapse of the graduate labour market in South Africa: Evidence from recent studies. *Research in Post-Compulsory Education* 15(1) pp,81-102.

Livingstone, D.W. (2018) *The education-jobs gap: Underemployment or economic democracy?* New York: Routledge.

Mckenzie, S., Coldwell-Neilson, J. & Palmer, S. (2017) Career aspirations and skills expectations of undergraduate IT students: Are they realistic? HERDSA 2017: *Research and development in higher education: curriculum transformation: Proceedings of the 40th HERDSA Annual International Conference*. Higher Education Research and Development Society of Australasia, pp.229-240.

Mncayi, N.P. (2016) *The determinants of employment status of young graduates from a South African university*. Doctoral dissertation. North-West University, South Africa.

Mutula, S.M. & Van Brakel, P. (2007) ICT skills readiness for the emerging global digital economy among small businesses in developing countries: Case study of Botswana. *Library Hi Tech* 25(2) pp.231-245.

Pool, L.D. (2017) Developing graduate employability: The CareerEDGE model and the importance of emotional intelligence. In M. Tomlinson & L. Holmes *Graduate employability in context*. Palgrave Macmillan, London, pp.317-338, doi.org/10.1057/978-1-137-57168-

Powell, L. & McGrath, S. (2014) Advancing life projects: South African students explain why they come to FET colleges. *Journal of International and Comparative Education* (JICE) 3(2) pp.213-226.

Rogan, M. & Reynolds, J. (2016) Schooling inequality, higher education and the labour market: Evidence from a graduate tracer study in the Eastern Cape, South Africa. *Development Southern Africa* 33(3) pp.343-360.

Roodt, M. (2018) *Economic empowerment for the disadvantaged: a new framework through which to uplift the poor.* Richmond, Johannesburg: The South African Institute of Race Relations (IRR).

Rosenberg, S., Heimler, R. & Morote, E.S. (2012) Basic employability skills: A triangular design approach. *Education+ Training* 54(1) pp.7-20.

Statistics South Africa (Statistics SA). (2018) *Quarterly labour force survey*: Statistical release P0211. Quarterly Labour Force Survey. Quarter 2. Pretoria.

Stukalina, Y. (2018) Career management in a technical university as an essential factor influencing its competitiveness. In I. Kabashkin, I. Yatskiv & O. Prentkovskis (Eds.) *Reliability and Statistics in Transportation and Communication. RelStat 2017. Lecture Notes in Networks and Systems* 36. Cham: Springer, pp.639-648.

Todd, A.M., Zydney, J.M. & Keller, J.M. (2011) Developing an online learning community for engineering, cooperative-education students: A design-based research study. *Journal of Cooperative Education and Internships* 45(1) pp.67-79.

Van Broekhuizen, H. (2016) *Graduate unemployment, higher education access and success, and teacher production in South Africa.* Doctoral dissertation. Stellenbosch University, South Africa.

Van Broekhuizen, H. & Van der Berg, S. (2016) Graduate unemployment and higher education institutions in South Africa. *Stellenbosch Economics Document de travails* 8(16) pp1-48.

Van der Berg, S. & Hofmeyr, H. (2018) *Education in South Africa.* South Africa: World Bank Group.

Vinichenko, M.V., Makushkin, S.A., Melnichuk, A.V., Frolova, E.V. & Kurbakova, S.N. (2016) Student employment during college studies and after career start. *International Review of Management and Marketing* 6(5S) pp.23-29.

Zaugolnikov, S.A. (2013) Problem after employment of university graduates. *Proceedings of the Regional Financial and Economic Institute* (2) http://www.science.rfei.ru/ru/2013/2/32 (Accessed 20 December, 2015).