

# MEETING INDUSTRY EXPECTATIONS FOR ENTRY LEVEL INFORMATION TECHNOLOGY EMPLOYEES – A PILOT STUDY.

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## **Abstract**

Considering the relatively large number of unemployed graduates in South Africa (National Treasury, 2011), it is necessary to assess whether Higher Education Institutions (HEIs) are adequately meeting the expectations of potential employers. In addition, it is also necessary to gauge the perceptions of students to determine the extent to which HEIs are preparing them to find employment after graduation.

The purpose of the study is to test the survey instruments to conduct a wide scale survey to take stock of the views and expectations of employers and their requirements of Information Technology (IT) graduates produced by HEIs and the perceptions of IT undergraduates who are about to enter the job market.

The outcome of the test samples will provide guidelines to amend and refine the questionnaires to support a large scale study to effectively establish an empirical benchmark against which periodic future reviews of IT qualifications can be conducted by different HEIs.

## **General Terms**

Human Factors

## **Keywords**

Employability, IT Graduate Attributes, Information Technology, Higher Education, Soft Skills, behaviour

## **Introduction**

Garcia (2009: 302) indicates that employability as a central driver of political and business development is imperative for creating national competitive advantage. Within this context the aim of this paper is to provide baseline information for further investigation to provide meaningful insight into student perceptions and expectations in comparison to that of the IT industry.

The Independent Institute of Education (IIE) is responsible for providing academic leadership, governance of teaching and learning, as well as the programme integrity undertaken nationally across 23 campuses. As a higher education institution the IIE caters for learning and development needs across a wide spectrum of education pertaining to three faculties (IT, Humanities and Business).

Focus areas include diplomas, undergraduate and postgraduate degrees, and short learning programmes), as well as skills and learnership programmes (skills programmes, short programmes and adult basic education and training) (AdvTech, 2012).

A key objective of The IIE is graduate employability which requires regular engagement with industry to ensure that graduates have acquired the skills, competencies and attributes in demand from prospective employers. This objective remains informed by the large number of unemployed graduates in South Africa.

The sample population represented two distinct groups, on the one hand the students and on the other the employees and that understanding of both is required to create a comparative framework.

This pilot study surveyed a limited number of students enrolled in the Diploma in Information Technology Management. It is envisaged that information obtained from the study will be incorporated into an expanded study that will be conducted across all IT qualifications.. During the study, students were surveyed specifically on their expectations for finding employment and their perceptions on how well prepared they perceive themselves to be for the IT world of work.

IT managers (or employees involved in the selection and mentoring of entry level IT employees) as a second sample group were surveyed on their expected attributes required for the entry level IT positions.

## **Background**

The public are continuously being reminded how industry and technology are changing to meet the demands of society as well as the demands these changes place on HEIs to supply the required skilled and qualified employees. While there has always been some form of link between higher education and the economy, this has recently been emphasised by a renewed sense of accountability and contribution on the part of institutions, and by the pervasive view that higher education does not produce the right kinds of graduates to meet changing workplace demands (Brennan *et al* 1996).

The general assumption is that closer relationships between higher education and industry are necessary to integrate industry's demands into curriculum design of higher education qualifications so as to ultimately ensure that the graduates have acquired the appropriate set of skills, competencies and attributes. Concern has been expressed about the relationship between higher education qualification composition and a country's economic growth; assuming that higher education institutions must provide the boost for the economy which relies on supply and demand. It is important to note that this human capital perception of the role of higher education has not gone unchallenged (Harvey & Knight 1996).

The South African Minister of Higher Education, Blade Nzimande (2011), stated that it was incongruous that there is a high unemployment rate in South Africa while industry is struggling to find skilled, qualified people. He stated that investing in education is the key to addressing economic growth and job creation. The focus for education must therefore, increasingly be on the preparation of a highly skilled, qualified, adaptable and flexible labour force to meet the changing economic and social needs of a growing economy (Brown 2001).

Students and parents alike also have expectations from Higher Education Institutions of learning. Tricker (2007) indicates that these expectations refer to quality and professionalism in the provision of services, access to suitably qualified lecturers, appropriate learning support and most importantly, the value of their choice of study toward achieving their career prospects.

Griezel (2002) noted that in the South African context the reality and debate over industry needs and the supply of suitable graduates are overlaid by the importance of reconstruction and development in order to position the South African society in line with the demands of a global knowledge society and economy. Being able to provide knowledgeable and skilled graduate employees means that Higher Education Institutions and industry need to identify and connect the attributes expected from graduates with industry expectations.

To achieve the above, Vorster (2010) proposes that Higher Education Institutions revisit qualification curricula as a starting point, to improve the preparedness of graduates to comply with industry needs and expectations.

The Council for Higher Education (CHE) asks how HEIs will respond to the needs of the labour market in a fast evolving and dynamic economic and social environment in the context of the the world of work as we enter the 21st century (2002).

The World Economic forum's chief business officer Robert Greenhill (2012) said that the BRICS countries (Brazil, Russia, India, China and South Africa) are lagging behind when it comes to capitalising on internet technologies. A lack of skilled employers and the shortcomings in business institutions were cited as factors contributing to stifling entrepreneurship and innovation.

## **Graduate attributes**

Specific interpersonal attributes were identified by Evans, Nel and van der Linde (2004) that IT professionals should acquire to become employable. Examples of these attributes include thinking skills, research skills, presentation skills, communication skills, cultural sensitivity, emotional intelligence, stress management skills, conflict resolution abilities, team interaction skills, relationship management skills, change management knowledge and self-management skills.

These interpersonal skills are often not taken into account when educating IT students. Until recently the focus has been on transferring technical knowledge rather than the soft skills. These interpersonal attributes are commonly included in the critical cross-field outcomes for each formal qualification but are not emphasised, and often overlooked, as being secondary to the technical outcomes. With the introduction and inclusion of Work Integrated Learning (WIL) in the IIE's new academic programmes as formal modules, many critical cross fieldoutcome related skills are incorporated by combining team or group work as part of the assessment process. Other soft skills development addressed in the WIL-programmes include: responsibility, ethical behaviour, exploration of entrepreneurial opportunities, environmental awareness and humanism.

Team members are used as peer-assessors for acquiring some of these interpersonal skills. For example, the peers are capable of assessing each other and their group in the areas of cultural sensitivity, emotional intelligence, conflict resolution, team interactions and relationship management.

In addition, IT lecturers and assessors will include as part of their formal assessment of the outcomes of the WIL project, the assessment of the remainder of the interpersonal skills. Examples of such skills that will be assessed independently include thinking skills, research skills, presentation skills and communication skills.

Assessment of soft skills will also include self-assessment where the student will be responsible to fill in a self-evaluation form which will expose them to other important interpersonal skills including, stress management, change management and self-management.

## **Academic programme development**

The skills and technical knowledge necessary, as identified by industry, are important requirements to ensure the employability of IT graduates. The challenge is to ensure that soft skills, together with technical knowledge are consistently and effectively incorporate t into the programme design, curriculum and credit allocations.

Programme Advisory Committees from IT Industry and other higher education institutions are used extensively to ensure that programmes and qualifications developed by the IIE comply with industry demand. Senior academics are also identified to serve on Programme Subject Committees, who work together with the IT

faculty to ensure that specific modules are developed for effective learning and assessment (Augustyn, 2011) inclusive of both technical knowledge and soft skills.

Jacobs and Augustyn (2012) argue that as South Africa continues searching for solutions to the unemployment crisis, Higher Education Institutions need to work closer with industries to ensure that graduates are more effectively prepared for the world of work. The only way to reduce the number of unemployed graduates is to address the disconnect which exists between industry and academia. Higher Educational Institutions should only be considered successful once their graduates are consistently being employed, either by industry or through selfemployment.

The challenge which The IIE, and possibly most other HEIs have to meet, has become: "What is it that Higher Education is expected to deliver, and how should it respond?"

### **Research methodology**

A pilot study was conducted where both students studying towards The IIE's Diploma in Information Technology Management and key employers of new graduates in the IT industry were surveyed on their expectations of graduates as entry-level employees. Different surveys were used for the two different groups questioned.

The student survey had two overarching areas which covered:

- The student's interest and desire to be employed in their chosen field of study
- The student's perception of their preparedness for the workplace

The industry's survey broadly covered the three areas of:

- Personal attributes of graduate employees
- Problem solving skills; and
- The requirements of a formal qualification.

### **Student survey**

The pilot student survey was conducted at two of the IIE campuses (Varsity College – Sandton and Rosebank College – Braamfontein) offering the Diploma in IT Management. The students from Varsity College are in their second year of study (the third year will only be offered to these students in 2013) and the Rosebank College group are third year students. Rosebank College has nine students in their third year and Varsity College has nine students in their second year of study in this particular programme.

This programme is in its first roll-out and therefore has not produced graduates that have entered the workplace.

This pilot study was used to test the instrument and adjust it so that it can be applied to a larger sample group.

The survey was distributed via email to Varsity College and Rosebank College. The Academic Co-ordinator supplied the students with hardcopies of the survey. The students were not influenced in the completion of the survey and all 18 students completed the survey which was a 100% return. The results were scanned and returned via email to the researchers at the IIE who are conducting the pilot study.

The information provided below relates to the most important results obtained from the research. The table below refers to the question on why students decided to enrol for the qualification. The question aimed to identify factors that motivate students to enrol for this specific IT qualification. The inclusion of this question emanated from curiosity pertaining to whether students really wanted to work within the IT industry or simply considered it as a career because they were unable to obtain entry into another discipline. Information pertaining to the results are provided in Table 1 below.

**Table 1: Percentage of respondents to the statement “I chose to study Information Technology (IT) because:”**

<b>I love computers</b>	<b>My friends are studying IT</b>	<b>I can make a lot of money in IT</b>	<b>I will always be employed</b>	<b>I didn't know what else to study</b>	<b>Other</b>
53.3%	0%	13.3%	13.3%	6.7%	13.3%

From the results it is clear that most students selected this qualification because of their interest in technology.

. The assumption can therefore be made that students with a vested interest in IT would be more inspired to succeed and engage in their studies, and so, possibly more effectively acquire the skills, knowledge and competencies taught in the programme.

The students that answered “Other” either:

- Failed to further qualify their response or
- They thought they had potential to succeed in an IT career or

- They would have preferred to have studied in a different field (e.g. sound engineering).

There was some concern that their perceptions about employability and economic well-being as graduates may have been influenced by the student counsellors who assisted them with course selection and enrolment, or generally, perceptions gained from family and friends.

However, results showed that expectations of a lucrative and stable career in IT are less important than their interest in the discipline. This is encouraging as it infers that their motivation to succeed in their studies will be a long term motivation rather than by material motivation which could be short-lived.

The next question related to whether students think that they will find employment after graduation. Results are provided in the following Table:

**Table 2: Percentage of respondents to the statement “I will find employment in IT”**

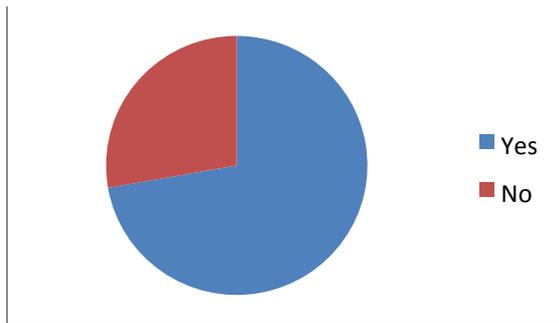
<b>Within 3 months of graduating</b>	<b>Within 6 months of graduating</b>	<b>Other</b>
62%	31%	8%

These results indicate the student’s perceived confidence in the job market which is mirrored in the shortages of skilled IT employees. South Africa is experiencing an IT skills shortage, which is comparable to the worldwide shortage of people with IT skills(ITWeb, 2010; ITWeb 2009; E-Skills, 2008).

The skills required in South Africa vary from lower level computer literacy skills needed by individual members of society to access technology based services, to higher level technological skills needed by specialist IT professionals.

The group that indicated ‘Other’ expected that it would take longer than six months to find employment.

The following response was provided by respondents pertaining to the third question on whether students thought their qualification covered every aspect required by industry:



**Figure 1: I believe my qualification covers everything I require to be prepared for a job in my chosen field.**

Again, the results displayed a certain level of naivety and unrealistic expectations amongst the students. The perception is that all that is needed to enter the job market will be accomplished through academic success. The fact that technology changes so rapidly and emerging technology developments cannot always be integrated into formal learning material instantaneously, has no apparent impact on student perceptions and confidence in their employment prospects.

Additional questions included in the survey were designed to:

1. Identify the student's IT field of interest where 72% of the students studying towards the Diploma in IT Management selected IT Management/Business and Analyst/Project Management. This is an indication of the alignment of direction of study to the student's preferred career path.
  
2. Assess whether the student would select to study the same qualification again indicating the commitment of the student's to their desired career choice. Seventy eight percent ( 78%) selected "Yes",
  
3. Determine the perception of what additional learning and training (in addition to their formal qualification) was required to be well prepared for an entry level position in the IT workplace, 50% of respondents indicated that additional courses were required, 22% indicated that some self-study would be required and 28% thought that their qualification had prepared them adequately.
  
4. Related to the question on the importance of academic success to securing employment, an overwhelming 94% indicated that academic performance was an important factor in securing a job.

## Industry survey

The pilot industry survey was conducted with IT professionals holding various positions in different industries. Application developers, business analysts, HR professionals and project managers were surveyed to gain a broad understanding of their requirements for entry-level IT graduate employees.

The companies that were selected did not have a direct association with the IIE or with the students that were surveyed. The survey was designed to assess the general requirements (skills, competence and attributes) which industry consider important when recruiting entry-level IT staff

The purpose of this pilot survey was once again to test the survey instrument prior to conducting a full scale study. The focus of the industry survey is to identify which skills are considered most important to employers for IT staff. Therefore, the industry survey included three areas of importance namely: personal attributes; problem solving skills; and the requirement of a formal qualification. Each of the first two areas are further divided to identify specific highly sought after skills.

The survey was designed with the following objectives in mind:

- To obtain a basic profile of the person and company being surveyed, including: company size, position in company, job function, and methods of identifying potential employees. This was included so that the specific answers given could be linked to specific company profiles (size and sector).
- Requirements related to personal attributes of new IT staff; problem solving skills; and the requirement of a formal qualification. In these questions respondents were required to rate which skills were more appropriate from 1 to the number of skills in each question.

The requirements questions included the following, in which respondents were asked to:

- Rate the **personal attributes** that are considered important when recruiting a new entry-level IT employee : creative and critical thinking; good communication skills; good presentation skills; cultural sensitivity; self-management ability; perform well under pressure; work well in small and large teams. This question is included to establish which type of soft skill not directly included in an academic qualification is considered most important when hiring a new employee.
- Rate the **problem solving skills** required from a new employee: using textbooks / manuals to find answers; search the internet for a solution or

information on solving the problem; knowing when to ask a mentor or supervisor how a problem can be solved; knowing when to request training to obtain skills that will be required for the job. This question is included to determine how important industry considers the ability of new employees to solve new problems .

- Rate the importance of a formal qualification (degree / diploma / certificate) when hiring a new IT employee. This question is included to determine if employers require a formal qualification before hiring a new employee.
- Rate the importance of requirement types when hiring a new employee: personal attributes; problem solving skills; formal qualification. This was the final question included to assess more specifically which requirements are considered more important when hiring new It employees.

The objective was also to determine whether any link exists between a specific company profile and the level of requirements for new employees. The survey was sent to ten companies varying in size from less than 50 employees to over 500 employees and 5 responded. The limited responses indicated that employers are divided in that they either indicate that a formal qualification or problem solving skills are most important.

It is interestingly to note that none of the responses rated personal skills, such as communication and team work, as most important attributes. This is not consistent with a study on D&B's North American Million Dollar Database [17], where it has been indicated that both employers and students indicate that interpersonal and personal skills are the most important attributes for new employees.

Problem solving was rated as one of the most important skills that a new employee should have. Respondents from smaller companies (50 and 200 employees) indicated that new employees must be able to search the internet to find a solution rather than asking a mentor or supervisor how to solve a problem. This may imply that new employees are expected to be much more self-sufficient when working in small companies and should be investigated in a further study.

In summary, a considerable amount was gained from the survey and the exercise was useful in identifying a number of areas which require refinement and clarification. Respondents did not answer the question in the expected manner, for example: some respondents rated several different skills at the same level rather than using the rating scale to arrange the skills in order of importance. Other respondents did not rate any one skill as most important. This indicates that the questions have been interpreted in various ways.

It was also concluded that much more clarity was needed in terms of the questions, for example, 'good' and 'well' are interpreted in different ways by different individuals

and more effective descriptions of the level of mastery, or experience with regards to each specific skill must be considered.

It was finally concluded that the instrument was not effective and that a re-design was required to ensure less ambiguity and improved clarity. A series of interviews will be conducted with industry representatives around their recruitment and selection processes, and more specifically, their criteria for recruiting and appointing entry-level IT staff. The data from the interviews will be used to inform the re-design of the survey. The revised instrument will in turn be re-tested in a second pilot survey.

## **Findings**

The surveys have encouraged the IT Faculty at the IIE to make a concerted effort to focus more on IT graduate attributes in the design and re-evaluation of the IT qualifications.

General on-going discussions with industry and findings from recent publications (Jacobs and Augustyn, 2012) will be incorporated into the considerations for improving the IT qualifications designed and implemented by the IIE.

The strategy is to re-evaluate the surveys and have them repeated annually, to gauge whether the Faculty is more effectively meeting expectations.

## **Conclusion**

The surveys provided researchers with insight into an area of student employability which will be expanded on in further research. Results from the research will be applied to improve the content of the IT formal qualifications offered by the IIE and the incorporation of softer skills required by the IT industry into the curricula.

A larger sample would have been preferable but considering that the Diploma in IT Management is a relatively new qualification and the class sizes are small in comparison to public institutions of higher education, the sample size was justifiable.

After analysis of the surveys it was realised that a closer alignment between the questions posed to students and those to industry was needed to determine how important the soft skills were to students and to gauge the student's understanding of those attributes and the importance thereof to improve their own employability prospects.

More importantly to the researchers, was how important the softer skills were to the respondents in the IT industry and how much emphasis was placed on it in entry level IT employees versus the IT students who were expecting their IT academic qualifications to be sufficient to successfully career advancements.

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