Recommendations for Improvements to the South African IT Curriculum: A Case Study of New Graduates' First Year of Employment
Extended Abstract
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1 Introduction

Employment issues in South Africa pose a substantial problem. Both employers and prospective employees (IT graduates) experience shortfalls and frustrations regarding the required skills [1]. Research aimed at reducing job shortages and creating a better cooperative liaison between academia and industry are encouraged, necessitating investigations into the possible causes of IT graduates' lack of preparedness for the job market and recommendations for improving the IT curriculum.

Main research question:
What recommendations for improvement to the South African IT curriculum can be extracted from a case study of new graduates' first year of employment?
Sub-questions:

1. What key skills do South African IT graduates lack upon employment?
2. What is the impact of graduates not being fully equipped to productively enter the workplace?
3. What measures does industry take when performance gaps are identified amongst employed IT graduates?
4. What would industry recommend for the improvement of the higher education IT curriculum so that graduates are fully equipped to productively enter the workplace?

2 Research Context

The research was conducted at a South African accredited private higher education institution in the IT Department of the Applied Science faculty. The department offers two modes of study: the traditional face-to-face (lecturing) contact mode called Lecture-based Learning (LBL) and the self-directed, self-study contact learning mode called the Mastery Learning Methodology (MLM) according to which most of the study material is covered via self-study whilst on campus. The modules must be completed

consecutively in the specified time frame and require a 60% pass mark. The MLM mode of study offers only Higher Certificate qualifications at National Qualifications Framework (NQF) level 5. This study considered only graduates who follow the MLM mode of study.

3 Methodology

A descriptive case study determined industry's experience with newly MLM-graduated employees to obtain guidelines for improving the curriculum. Questionnaires and interviews collected data from three IT companies employing MLM-mode graduates. Three different questionnaires were used for the line managers of employed graduates, the employed graduates themselves, and the recruitment staff. The line managers of the employed graduates and the graduates were also interviewed. Recruiting personnel shared their experiences via a questionnaire. Table 1 depicts the 12 participants' demographics.

Table 1. Participants' demographics.

Participant	Duration of employment	Age range	Gender
Employed Graduate 1	2 years 4 months	21 – 24	Male
Employed Graduate 2	1 year 8 months	21 – 23	Male
Employed Graduate 3	3 years 6 months	22 – 25	Male
Employed Graduate 4	1 year 10 months	21 – 23	Female
Line manager – Company 1	12 years	35 – 40	Male
Line manager – Company 2	18 years	40 – 45	Male
Line manager – Company 3	15 years	40 – 45	Male
Line manager – Company 3	20 years	45 – 50	Male
Recruitment personnel 1	10 years	25 – 30	Male
Recruitment personnel 2	8 years	25 – 30	Female
Recruitment personnel 3	12 years	30 – 35	Male
Recruitment personnel 4	15 years	30 – 35	Male

Interviews were recorded preserving the anonymity of participants. The data from questionnaires and interviews were prepped manually for easier analysis by transcribing all recordings systematically. Triangulation was used to check if the same or similar data sets and patterns are attained from multiple sources by way of manual colour coding.

4 Findings

Sub-question 1: What key skills do South African IT graduates lack upon employment?

- Soft skills (communication skills and professionalism). New graduates find it difficult to express themselves adequately when faced with problems and to communicate with different levels of management. They also lack professionalism.

- Practical/technical skills in specific IT areas of software and hardware such as the proper use of version control tools, web services and servers.
- Problem-solving skills.
- Core subject knowledge skills such as multithreading in application development, networking and server concepts.

Sub-question 2: What is the impact of graduates not being fully equipped to productively enter the workplace?
Inadequately prepared graduates have a financial impact on a department without realising this. Line managers offer extra courses or identify specific certifications to upskill unprepared graduates. The employer bears the cost of the courses or certifications as well as the loss of revenue due to the graduate not being productive. Most participants believed that their higher education results did not affect the time taken to become productive. One participant offered a different view, explaining that the knowledge gained during his studies assisted him in quickly becoming productive.

Sub-question 3: What measures does industry take when performance gaps are identified among employed IT graduates?
- Line managers provide mentorship or coaching.
- Training in specialised IT areas with Java, Microsoft and CompTIA certifications.
- Employed graduates are subjected to performance management on a weekly basis.

Sub-question 4: What would industry recommend to improve the higher education IT curriculum so that graduates are fully equipped to productively enter the workplace?
- Pay more attention to soft skills and incorporate these in the curriculum.
- Engage extensively with work-related practical and technical aspects.
- Expose graduates to the latest tools and concepts used in the industry.
- Align the curriculum to keep up with industry trends.

Main research question: What recommendations for improvement to the South African IT curriculum can be extracted from a case study of new graduates' first year of employment?
- Strengthen graduates' skill sets by covering more soft skills, hard skills, critical-thinking skills and trending technologies.
- Amend the curriculum design to include more exposure to industry-related practical work with greater exposure to industry environments using industry liaisons.
- Expose graduates to the latest tools used in the industry.
- Enhance their employability by including IT-related certifications in specialised areas (e.g. alignment with and/or the addition of international certifications).

5 Conclusion

The data reflect noticeable trends and offer preliminary points for more studies on curriculum enhancement in higher education in the IT sector. The findings show that unprepared graduates affect industry financially. Vital skills that graduates lack include

both soft and industry-related practical skills. Enhancing the IT curriculum in accordance with the recommendations would help to equip new graduates with industry-required skills and prepare them to be more productive on employment.

References

1. Simon, D & Jackson, K. 2013. A closer look at information systems graduate preparation and job needs: Implications for higher education curriculum enhancements. *World Journal of Education* 3(3):52–62, last accessed: 2018/04/19.