A Mentorship Model for Simulated Work Integrated Learning using Windows Phone

Mosima Anna Masethe, Hlaudi Daniel Masethe

***Abstract*— The South African competitive economy requires computing graduates to have an ability to apply problem solving skills, knowledge, and experience within a dynamic ICT work environment. The qualifications in computing provide foundation for knowledge and skill development, and its only through Work Integrated Learning (WIL) that students acquire practical experience, entrepreneurship skills and engage in professional computing while preparing for their future career transitions. South Africa has a 25 percent unemployment rate, and the government alone, will not be able to win the battle. The integration of theory and practice in learning can occur through a range of approaches, apart from formal and informal work placements, including Virtual or Simulated WIL. The research article provides a mentorship model in simulated work integrated learning to enable students to acquire practical experience, entrepreneurial skills and engage in professional computing while preparing for career transitions. The research results presents a case study for the Tshwane University of Technology in the implementation of the simulated work integrated learning mentorship model. The intention is to prepare students for the 21st century challenges in the global economy and becoming responsible citizens in enabling mobile technology to solve service delivery problems.**

***Index Terms*— Work Integrated Learning, simulation, mentorship, model**

I. INTRODUCTION

South African University graduates are facing a critical time in history, where there is a shift in the economy and demographic factors influencing competition and pressure amounting on those employed and those looking for employment [1]. WIL creates understanding of the work place culture and drives career development and the career choice pathways [2]. It is critical for universities to actively examine and re-curriculate to educate a competitive workforce required for the 21st century in which mentorship models will play a role in simulated work integrated learning. WIL programs have provided training and career development opportunities at previous times of economic recession and served as a license to employment sectors, however, we still have a moderate percentage of students that are not employed or placed [1]. WIL gives students opportunity to actually put their learning into practice in an approved workstation, while students are able to engage and create meaningful knowledge in applied professional setting [2]. However, opportunities for industry placements are limited and moderate in South Africa, especially in the computing sector [2]. The Universities of Technology in South Africa has all introduced WIL in their curricular, and this trend is potentially problematic since work placement is a heavy drain on scarce resources. The WIL activities requires access to quality learning environments, preparations and support, and time investments by potential employers and mentors [3].

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II. SIMULATION AS A WIL PROGRAM

Simulation is a method identified in the running of work integrated learning programs, others being project work, work based placement and virtual WIL [4]. Simulation is a method for preparation and knowledge that can be applied in a number of disciplines [5]. Simulation, in this research is defined as representation of reality, as a model of events or processes or items that exists [4]. The recent developments in Information Technology (IT) led to an increase in number of simulations in training conducted within WIL programs, with the most predominant example being simulated work environment and role –plays [4]. Simulation is a technique to substitute and intensify real experiences with guided ones that evoke substantial aspects of real world in a fully interactive way [5].

The example of simulated work environment at Tshwane University includes a scientific computer laboratory sponsored by Software Engineering Department, while the role players include Microsoft South Africa as an academic business partner. In this case simulated work environment is a reality that focuses on work-place interactions, employer involvement; mobile based applications using windows phone act instead of a placement. The department includes participation from industry in South Africa in their simulated work environment, where mentors from industry play a major role. The success of the simulations is predicted on factors that possess authenticity, planning, structure and support for the team based learning [4].

III. RESEARCH DESIGN

The research is a Case Study within the Tshwane University of Technology with an implementation of the mentorship model, for the simulated aspects of WIL that enables students to experience workplace within an educational

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framework. The initiatives on simulated work integrated learning are defined within a campus setting that emulates important objectives within the workplace [6]. The software engineering students within the computing sector are taken through an environment and training to design certified mobile applications with a mentor from industry with a goal to develop mobile entrepreneurs within a South African context. The students design and upload the applications to the market place, as part of the training exercise. After mastery and branding of the applications, students will now presents innovative ideas which will lead to a registered patent and a non-disclosure agreement in consultations. The proposed model describes a partnership between students, employers and the university with specified responsibilities for all stakeholders [6]. A simulated work environment allows students to experience a workplace within the educational framework, the proposed model take an approach from an employer involvement with a focus on work place interactions [7]. The purpose of the model is to improve employability and entrepreneurship of the students, and embrace ability to retrieve relevant information, improve communication and presentation skills, planning and problem solving, and improve social development and interaction in a workplace [6].

IV. INDUSTRY EXPOSURE

Industry exposure is a third year core module in all national diplomas in IT, in most South African Universities of Technology. The module is divided into two sections, Industry Exposure A which is basically aimed to prepare a student for the workplace, while Industry Exposure B brings a student into the workplace environment for authentic experience in industry. Students cannot graduate without certifying the requirements for the expected core modules. It's a challenge on its own, as industry is unable to absorb all students, and the only solutions most universities are providing are simulation environment, which cannot be authenticated by industry expects.

In order to actively address workforce and education challenges at the Department of Software Engineering, at the Tshwane University of Technology, a mentorship model was proposed which build upon five stages of work integrated learning: preparations, placement, monitoring, assessment and feedback/reflections. The proposed mentorship model aims to provide understanding of how a computing professional in software engineering works in practice and equip students with entrepreneurship skills and practical skills to apply in a real world situations [2]. It is most important for software engineering students to understand, accept latest methods and practices in the design of intricate computing systems [8].

The Tshwane University of Technology adopted a flowchart model on figure I that depicts five stages of work integrated learning on quality management of work placement [9].

The adoption of the model is met with a number of challenges in bridging the gap between industry and world of work which are: Inappropriate placements of students in the industry, reported to be a time consuming exercise, an insufficient resources to support industry visits and monitoring, poor industry Liaison and Poor stakeholder management

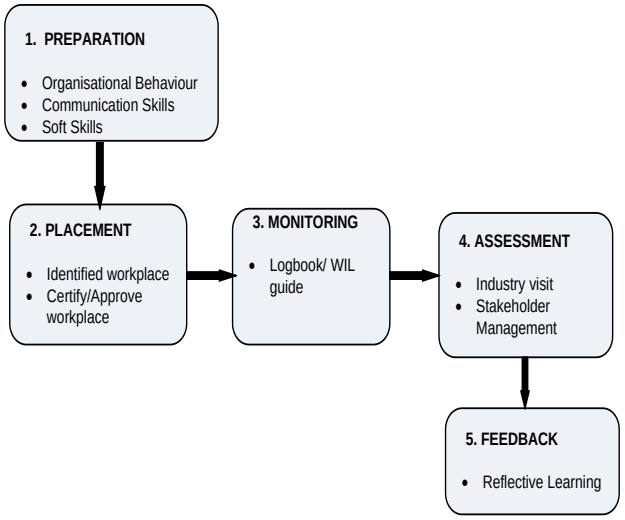

Fig 1: Quality Management Work Placement Learning Model

The industry demands that an investment in learning must be transformed into industrious outcomes that progress the organisation towards defined strategic goals [10]. WIL has potentials, although limited to achieve productive outcomes since it allows students to contextualise study content within the socio-cultural and serviceable environment of the workplace [10]. The model above relates challenges of developing industry partnership which is problematic and demands rearrangement of knowledge power relations between academia and industry. Partnership requires academic curriculum to be aligned with work tasks which offers experience for student to focus on outcomes that serve that industry expectations [10]. The alignment is complicated and challenging for universities of technology, as vendor relationship has underlying expectations [10]. Partnership with industry for WIL implies that academics do no longer dominate curriculum matters, but advocate content and theoretical knowledge base, while they rely heavily on the tacit knowledge of the organisations.

V. MENTORSHIP CAREER MODEL

The proposed model is based upon developing a constructivists approach based on student's active involvement in problem solving and critical thinking based on learning mobile application relevant and engaging to the 21st century [11]. Students construct their own mobile application, upload to the market place and test their ideas based on the number of downloads to their applications. The model introduces the following principles: student undergo training with experienced mentor for a concrete experience, reflect and re-examine through hands on projects, formulate

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innovative concepts and test in new environments [12]. The mentorship model adopts the three techniques introduced by the Newcastle's adaptation of Kolb's (1984) model which allows students to construct their own knowledge from their personal and cultural history, allow holistic and integrated learning, while experience-based focus is engaged [11].

The model enhance its relevance and connections for service delivery issues and problems faced by the communities in South Africa, by introducing an entrepreneurships to solve real-world problems which is a source of genuine creativity and academic importance [13].

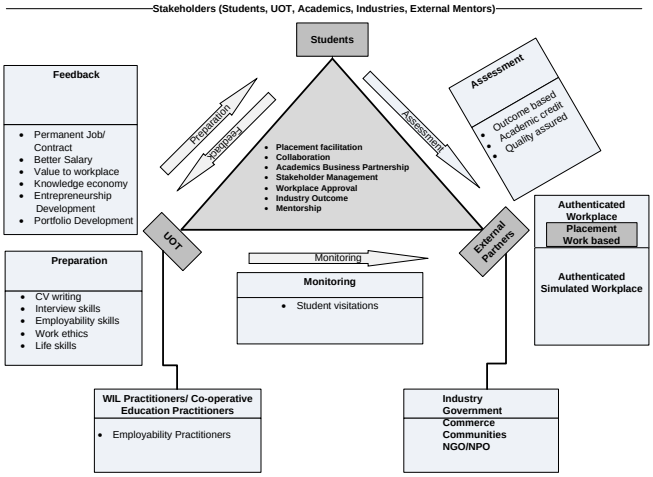

Fig 2: Mentorship Model for Simulated Work Integrated Learning in Mobile Applications

The above model on figure 2 demonstrates an approach using academic business partnership, where academic manager serve as a mentor and develops a partnership which is based on industry expectations and pre-defined outcomes. The industry assigns a mentor at the university workstation for simulated work integrated learning with pre-defined goals and SMART objectives, which are aligned to the industry requirements, with all required activities. Upon an understanding on the desired outcomes, student register for the module, attends inductions and workshops, experience hands on workplace environment, and develop certified application for the market place as per the industry desired outcomes.

Students will then create innovative ideas for solving service delivery issues for the community, which engages partnership model for the faculty to relate to the community [13]. Knowledge is required as a point of entry into the software engineering career, an a need arise to provide students with more than just a method and academic problems, but allow time in industry working on real software development projects, and the model is able to provide that insight [8]. The simulated work environment enhanced skills required by industry [5], such as: problem solving skills, decision making skills, communications skills, team based competencies, technical competencies, and functional expertise.

The research study shows that the simulated work environment through the proposed model improves learning, it is effective in developing skills, and help the student prepare to deal with unanticipated industry challenges and events, and increase confidence.

The mentorship model is validated on the success stories of the students since the adoption. Figure 3 below shows the student demographics since 2011 semester 2 at the Tshwane University of Technology.

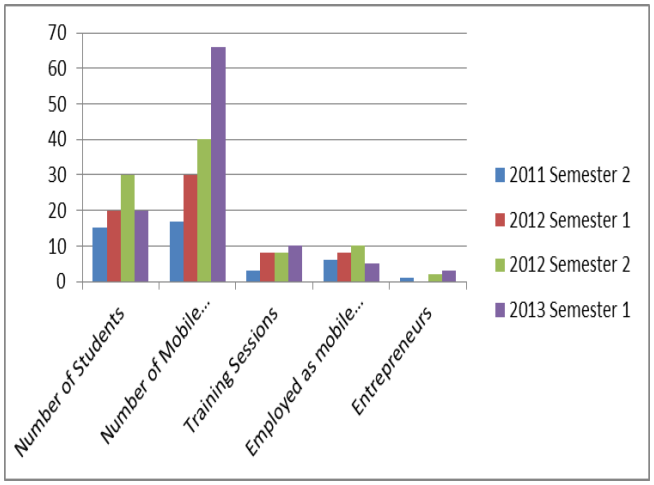

Fig 3: The student demographics since 2011 semester 2

The student got an opportunity to experience a simulated work environment within the campus that demonstrates design problem complexities and richness of a mobile development from industry perspective in creating new mobile products [8].

VI. CONCLUSION

Mentorship model in a simulated work environment has opened a new educational paradigm in the application of software engineering. The evidence through the practice can be put into action by WIL practitioners, where challenges in WIL placements arise. The key to the success of the model is academic business partnership, with integrated learning outcomes decided by industry and academia. The success of simulated work integrated learning activities contributes to maintainable employees for the future economic growth of the country.

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