Critical Thinking Perspectives on Work Integrated Learning in Information Systems Education

A. Harmse, R. Goede

Abstract—Students with high level skills are in demand, especially in scare skill environments. If universities wish to be successful and competitive, its students need to be adequately equipped with the necessary tools. Work Integrated Learning (WIL) is an essential component of the education of a student. The relevance of higher education should be assessed in terms of how it meets the needs of society and the world of work in a global economy. This paper demonstrates how to use Habermas's theory of communicative action to reflect on students' perceptions on their integration in the work environment to achieve social integration and financial justification. Interpretive questionnaires are used to determine the students' view of how they are integrated into society, and contributing to the economy. This paper explores the use of Habermas's theory of communicative action to give theoretical and methodological guidance for the practice of social findings obtained in this inquiry.

Keywords—Discourse, Habermas, Information Systems Education, Theory of Communicative Action, Work Integrated Learning.

I. INTRODUCTION

THERE is a pressing need in South African higher education to increase both access and throughput rates in the fields of Computer Science and Information Technology. Given the right combination of educational platforms, the fundamental skills of learners may be stimulated, developed and enhanced. A concern is the quality of Information and Communication Technology (ICT) graduates. There is a strong relationship between a country's economic growth and the level of education, including ICT education. Nationally and internationally businesses are in search of various ICT skills sets from employees and graduates. Organisations finds it difficult to come across professionals with the required ICT skills sets, in order to fill vacancies, and also some current professionals find it difficult to find jobs [1-3]. The old-school model of learning without interest, facts and reciting them out of context is no longer satisfactory to prepare students to survive in today's world. Solving highly complex problems requires that students have both fundamental skills (reading, writing and arithmetic) and 21st century skills (teamwork, problem solving, research gathering, time management, information synthesizing, utilizing high tech tools). With this mixture of skills, students become directors and managers of their learning process, guided and mentored by a skilled educator.

In a study recently conducted in Australia, the need was emphasized on the importance to identify different stakeholder motivations and objectives for participating in WIL.

A Harmse is with the Information and Communication Technology Department, Vaal University of Technology, Vanderbijlpark, 1900, RSA (phone: +27 169509728; e-mail: anneke@vut.ac.za).
R Goede is with the Vaal Campus of the North-West University, Vanderbijlpark, 1935, RSA (phone: +27 16103276; e-mail: Roelien.goede@nwu.ac.za).

Participants highlighted the need for a stakeholder integrated approach, to the planning and conduct of WIL based on formalized sustainable relationships and a common understanding of the procedures and commitment required by all those involved. This report mentions different challenges and issues regarding WIL, with one of the challenges to improve communication and coordination [4].

This paper reflects on students' perceptions on how they contribute and are integrated into IT industry, from the perspective of the Theory of Communicative Action (TCA) of Habermas. In tertiary education Work Integrated Learning (WIL) is seen as an extension of the classroom, a valuable tool where theoretical and practical knowledge are combined. This paper is divided into four parts, the first being a detailed description of WIL and the implementation thereof at VUT. The second part discusses the key concepts of Habermas's TCA which forms a basis method of this study. The latter two parts examine the use of TCA in an ICT WIL programme. Based on this study the author of this paper draws some relevant conclusions.

II. WORK INTEGRATED LEARNING

At Vaal University of Technology (VUT) students complete their diploma in Information Technology in three years of which the final six months are spend in industry. The aim of these six months is to provide the students with exposure to IT work-environments. This is an example of WIL.

A. What is Work Integrated Learning?

Work integrated learning is used as an umbrella term to describe curricular, pedagogic and assessment practices, across a variety of academic disciplines that integrate formal learning and workplace concerns, within a purposefully designed curriculum [3]. Work integrated learning is when practical and theoretical learning activities are incorporated and related to the workplaces in focus for different professions [5]. The integration of theory and practice in student learning can occur through a range of WIL approaches. This can be formal or informal work placements. WIL is primarily intended to enhance student learning. Numerous innovative curricular and assessment forms have developed over the years in response to concerns about graduates' employability and public accountability. Examples of WIL include: action learning, apprenticeships, cooperative education, experiential learning, practicum placements, problem based learning, scenario learning, service learning, team-based learning, virtual or simulated WIL learning, work-based learning etc. Given a closer look to the different approaches to WIL, all are based on the understanding of the importance of enabling students to integrate theoretical knowledge gained through

World Academy of Science, Engineering and Technology
International Journal of Educational and Pedagogical Sciences
Vol:6, No:4, 2012

formal study, with the practice-based knowledge gained through engagement in a work or professional environment. The Council of Higher Education (CHE) emphasizes that the alignment between work and education implied in WIL is not restricted to work placement.

B. Work Integrate Learning at VUT

At VUT an ICT diploma consist out of six semesters of which the first five semesters are used to teach theoretical principles. During the last semester of their studies, students are expected to work within the specific focus areas in industry as stipulated in the outcomes of the qualification registered at the Department of Education. For example students can work Software Development, Business Applications, Information Management, Business Analysis and Databases. Students are not allowed to work in Networks, Help Desk and System support as it is not part of the focus of the qualification although for example Networks are offered to students during four of the five theoretical modules. These blurred boundaries cause confusion for all different stakeholders involved in WIL in an ICT qualification.

With main aim of tertiary education to prepare students for industry, it is necessary to know what students should be able to do after obtaining a qualification. Input from is needed to understand expectations from industry, students and the university In order to achieve maximum benefit to all the involved and affected parties the following questions need to be investigated:

- What is the real benefit to students doing WIL?
- Does industry benefit from students doing WIL?
- Do students contribute to the economy or are they treated and seen as cheap labor?
- When forcing students to work within specific focus areas, do they gain enough experience?
- Are students mentored during WIL, or do students work only in IT environments without mentorship?
- Are mentors approachable with problems?
- Are students seen as employees and treated accordingly?

Perhaps these issues can be explained from the perspective of the Communicative Action Theory of Habermas.

III. COMMUNICATIVE ACTION THEORY

The work of Habermas, a German sociologist and philosopher, is accepted as the key contribution to thinking from the Frankfurt School. Habermas reflects the Frankfurt School by relating himself by taking apart the power of positivism. He asserts that whilst positivism's focus is on obtaining understanding, critical theory's focus is upon emancipation [6].

Habermas's key intention of TCA is to give a theoretical framework for the critical analysis for the structures for and reproduction of discourses of the public sphere [7].

Habermas argues that the most fundamental characteristic of human beings is our ability to coordinate our actions through language and communication. Furthermore, the ability to communicate is grounded in the ability to understand each other. Thus communication is the construction of understanding and then agreement about shared activities. Habermas explains that nature of a rational argument (or discourse) in two concepts: (1) that contentions or utterances rest on particular validity claims that may be challenged and defended, and (2) that the process of debate should aspire to being an ideal speech situation. In everyday conversations and discussions arguments, misunderstandings and debates may develop. These lead to one or more of the validity claims to be challenged, which is then up to the speaker to defend the claims and to challenge opponents. In order to achieve valid outcomes the discussion should occur in such a way that it is arguments themselves that win, rather than distorting aspects of people involved or the social/political situation.

It is important in such an ideal speech situation to ensure that:

- All potential speakers are allowed equal participation in a discourse.
- Everyone is allowed to
o Question any claims or accusations made by anyone;
o Introduce any assertion or claim into the discourse;
o Express their attitudes, desires and needs.
- No one should be prevented by an internal or external party from exercising any of the above rights.

Habermas [8]also identified three forms of discourse which can be used in order to achieve valid results in a verbal argument namely Aesthetic, Therapeutic and Explicative discourse.

- Aesthetic discourses work by critics arguments bringing us to consider a work or performance which itself demonstrates a value [9]. Habermas defines it as "A work validated through aesthetic experience can then in turn take the place of an argument and promote the acceptance of precisely those standards according to which it counts as an authentic work"[8]. Habermas view the mediation of the critic as an important role, in order to bring people to the revelatory aesthetic discourse.

- Therapeutic discourse explains self-deception. A person is called rational who is willing and able to free himself from illusions, and indeed from illusions that are not based on errors regarding facts, but on self deceptions. Such self-deceptions typically arise from developmental experiences, which have left certain inflexibilities of behavior or biases of value judgment. These rigidities do not allow flexible responses towards a situation requiring urgent action. Therapeutic discourse also claims to be free from illusions and suggest an aspect of self-analysis, with the most difficult illusions hidden in our subconscious.

- Explicative discourse describes the method on how to reach an understanding of an expression. When one come to accepting and reacting to disturbances, by reflecting on linguistic rules he is called rational. This takes place when one is willing to question the grammar of any system used to communicate.

World Academy of Science, Engineering and Technology
International Journal of Educational and Pedagogical Sciences
Vol:6, No:4, 2012

A difficult subject, which was not raised by Habermas remains whether visual language can put forward an argument?

The Theory of Communicative Action, is what Habermas calls the colonization of lifeworld by systems. Money and power, which are quantitative, have begun to operate on their own terms, so that individuals become "invisible", known as systems. Opposed to systems is lifeworld (culture, society and personality), where one can not quantify influence of value commitments, in view of the fact that these are only enacted in communication among people. With society which is integrated both through actions of its members and systemically by the requirements of the economical, hierarchical and oppressive system. This gives rise to a twofold idea of modern society, the internal subjective viewpoint of the lifeworld and the external viewpoint of the system. Societal integration depends on the balance among lifeworld and systems. This balance in modern societies has been influenced as the system processes of the economy dominate lifeworld processes.

The work of Habermas has been used frequently in the field of Information Systems. In 2002[10] published a paper on using Habermas' critical work in Management Information Systems (MIS). In this paper, [9], they emphasize how the work of Habermas can be used in understanding and relieving the conflicts brought by political structures in organizations. Specifically, Habermas' critical communications theory is used identify that the deployment of relationships understood with a purpose and rational understanding of reality, as a selfish instrument, is far from taking a relational stance to treating collective problems. Conventional thinking in the Information Systems and Information Technology field about communication, information and knowledge was also examined, and came to the conclusion that systems are viewed and treated as control systems, which rely on computers and control mechanisms. Varey and Wood-Harper proposed to make use of recursive systems for understanding purposes. Relating through communicative action is the basis of conflict management in which argumentative examination of the validity and rationally clams of knowledge is conducted under conditions that preclude systematic distortion of communication.

In 2010 another study was conducted using the theory of communicative action of Habermas by [11]. The purpose of this study was to design and build an internet-based electronic forum supporting a form of public discourse aimed at societal conflict mediation. The system was developed to give their participants an up-to-date and structured overview of the positions of different stakeholders on an issue, helping them to find true consensus. The requirement to participate in it was the observance of a set of rules intended to serve Habermasian form of discourse. The prototype version of the system was tested with a number of test reports on environmental issues which have been created. This was the same category of participants engaged in a process of self-understanding [11].

In communicative action the objective is to achieve mutual consensus, common understanding of norms, meanings and values and to maintain social relationships through formal or informal communication [12], therefore stakeholders in an ICT WIL programme need to be voiced.

IV. COMMUNICATION ACTION THEORY AND WORK INTEGRATED LEARNING AT VUT

Procedures of implementing WIL at VUT developed over many years into structures. These structures are unquestioned and applied to all students doing their WIL module. As reported in section II many questions can be asked about the current system. The main question raised by this paper is whether better constructive communication is required to improve the experience of all the stakeholders.

In the current system, students are interviewed as part of the monitoring process. As a first attempt to better understand the problem environment students were questioned on the communication structures in their work environment.

Communication is the single most vital instrument to reach an understanding in workplace. ICT students currently enrolled for WIL, were questioned, against the three types of discourse identified by Habermas.

A. Data Collection

Questionnaires were distributed to students who are currently registered for a WIL programme in ICT. In total an amount of 16 questionnaires were e-mailed to students, whereof 7 students responded on the questionnaire. Questions were formulated from a TCA perspective in order to better understand communication structures of students participating in a WIL programme. It was made clear to students that the questionnaire wont influence their marks obtained for the subject, and that there is no correct or incorrect answer.

B. Student Perceptions

In an attempt to identify students' perspective regarding aesthetic discourse, students were asked whether they think they contributed to the economy and whether their mentors indicate interest in what they have learnt at VUT. All the responses, except for one think they do contribute to the economy. This student indicated that "I only worked as an intern, busy with the learning process. The project that I am currently working on is going to contribute to the way the client's company operates". In the second part, again only one student indicated that his mentor did not show any interest in what he learnt at VUT. Responses indicated that mentors indicate great interest in what they learned at VUT. A student indicated that her mentor commented on the standard of Developer is to low and needs improvement. One student indicated that "my mentor pushed me hard in certain moments that I actually feel was being unfair, but in the end I realized that he was doing it for my own benefit. He asked me on numerous occasions to apply what I learned at school and not to be afraid to take initiative and make mistakes as that are the only way that I will be able to learn".

When evaluating therapeutic discourse students were asked whether they feel inadequate at their workplace. Four students reflected that they do not feel inadequate at all. A student

World Academy of Science, Engineering and Technology
International Journal of Educational and Pedagogical Sciences
Vol:6, No:4, 2012

replied "at times when I'm supposed to meet deadlines and I do not meet then I feel inadequate to the company since I have let them down." In another question evaluating student self deception, students were asked if they experience their WIL programme as a valuable experience. Students perceived clear benefits from attending a WIL programme in ICT with only two students who viewed this as negative experience. No explanations were given.

When investigating students' responses regarding Explicative discourse, they were asked if they experience difficulties when communicating to peers and mentors, as well as whether they think their communication skills improved during this programme. In response to the first question on their ability to take communicate with peers and mentors in the organizational, none of the respondents replied that they have difficulty to communicate with peers and mentors. An interesting comment from a student is "my manager always insisted that communications skill is one of the most important tools in business. So I have consciously made an effort to improve on this aspect" In respect to the question asked whether they think their communication skills have improved, all students indicated that they do believe their communication skills have improved. Students reflected they got used to using jargon in an IT environment, it become easier to communicate to people not on the project team for example engineers.

C. Industry Perceptions

Not enough focus is given to understanding perceptions of industry. Communication with industry previously focused on the evaluation of specific students rather than the benefits of WIL for the company. In future a study will be done to investigate the expectations of industry.

D. University Perceptions

One of the most important objectives of technical universities such as VUT is to prepare well equipped and market-ready students.

Industry partnered research should be conducted aiming to identify and address stakeholder interests and needs. Such research can be done using the framework for reflective practice based systems thinking developed by Midgley [13]. He identified three aims for critical system heuristics. The first aim is to enhance reflective competence for professionals, decision-makers and ordinary people. The second aim is to provide "heuristic" support in the form of questions and argumentation tools and lastly to provide a useful starting point for understanding the methodological requirements of such an approach to reflective practice. The boundaries of analysis can be set by using Ulrich's checklist of boundary questions. These questions focus on sources of motivation, sources of power, sources of knowledge and sources of legitimation.

E. Using TCA to Rethink WIL at VUT

The TCA can be used to rethink the implementation of WIL at the VUT. The following action is proposed to achieve this from the perspective of TCA.

- Habermas emphasized the need to develop TCA through participatory processes. Therefore stakeholders need to be identified critically as identified by [13] based on Critical Theory.

These stakeholders might include:
o Past students
o Current students
o Industry
o The university as an entity
o The department of IS
o Government

- In communication with stakeholders it important to specify that all role players has equal importance and rights in terms of voicing opinions (All potential speakers are allowed equal participation in a discourse). This implies that the alumnus students have equal right to voice opinions to the lecturer in the IT department. Each stakeholder should be motivated to voice their own objectives (agenda) but also be sensitive to other stakeholders' interests. Focus group sessions where different stakeholder representatives are present may be used to achieve this.

- A new procedure that accommodates all views should be developed and be distributed for comments to all stake holders.

V. CONCLUSION

This paper evaluated the use of Habermas's TCA in a WIL programme. The empirical study indicated that the majority of students are satisfied in their work environment in terms of their roles in communication in the organization. Further research between industry and universities need to be conducted. TCA can be used and as a method to ensure that all parties involved views are taken into consideration when implementing WIL in an ICT programme.

REFERENCES

[1] S. Gregor, B. R. Von Konsky, R. Hart et al., "The ICT Profession and the Body of Knowledge," in Australian Computer Society, Sydney, 2008, pp. 34.
[2] Department of labour, ICT skills in the labour market: An occupational-level analysis focusing on computer professionals and associate professionals 1996 – 2005, 2008.
[3] Council on Higher Education, "Work-integrated learning: Good practice guide," HE Monitor, C. o. H. Education, ed., Council of Higher Education, 2011, p. 81.
[4] C. Patrick, D. Peach, and C. Pocknee, The WIL [Work Integrated Learning] report: A national scoping study, Brisbane, 2009.
[5] J. Dimenäs, "Beyond dichotomization: A different way of understanding work integrated learning," Journal of Cooperative Education & Internships, (442, http://www.ceiainc.org/journal.asp?PageID=230&Document_ID=4209, [28 November 2011, 2010].
[6] C. Brooke, "What does it mean to be 'critical' in IS research?," Journal of Information Technology, vol. 17, pp. 49-57, 2002.
[7] W. Cukier, O. Ngwenyama, R. Bauer et al., "A critical analysis of media discourse on information technology: preliminary results of a proposed method for critical discourse analysis," Information Systems Journal, vol. 19, pp. 175-196, 2009.
[8] J. Habermas, On the pragmatics of communication, Cambridge, Massachusetts: MIT Press, 1998.
[9] S. Szczkulen, "Exploding cinema 1992-199: culture and democracy ", University of Westminister, London, 2002.

[10] R. J. Varey, and T. Wood-Harper, "A theoretical review of management and information systems using a critical communications theory," Journal of Information Technology, vol. 17, pp. 229-239, 2002.

[11] M. S. H. Heng, and A. de Moor, "From Habermas's communicative theory to practice on the internet," Information Systems Journal, vol. 13, pp. 331-352, 2003.

[12] S. K. Puri, and S. Sahay, "Participation through communicative action: A case study for GIS for addressing land/water development in India," Information Technology for Development, vol. 10, pp. 179-199, 2003.

[13] W. Ulrich. "A brief introduction to critical system heuristics (CSH)," 20 December 2011; http://projects.kmi.open.ac.uk/ecosensus/publications/ulrich_csh_intro.pdf.

[14] G. Midgley, Systemic intervention: Philosophy, methodology and Practice, New York: Plenum, 2000.