

**A Comparative Study of Cooperative
Education and Work-Integrated Learning in
Germany, South Africa, and Namibia**

Prof. Dr. Karin Reinhard

Dr. Rosemary Townsend

Carver Albertus Pop

Anna Pogrzeba

A Comparative Study of Cooperative Education and Work-Integrated Learning in Germany, South Africa, and Namibia

Throughout the world, universities of cooperative education have had a major impact on their countries and regional economies, by preparing graduates for the world of work, and applying their research skills to identifying the problems and needs of society and industry, and together finding solutions to those problems (Du Pré, 2010). However, the degree to which work-integrated learning is implemented in different countries varies greatly. The authors of this paper seek to compare the cooperative education models in their respective countries of Germany, South Africa and Namibia, and highlight where elements of each model can be implemented in the other country, in order to achieve greater synergies between theory and practice, as well as financial stability and employment security for students.

The paper will detail the history of cooperative education in each of the three participating countries, drawing on the experience of Baden-Württemberg Cooperative State University in Germany (DHBW), Cape Peninsula University of Technology in South Africa (CPUT), and Namibia University of Science and Technology in Namibia (NUST). It will then compare the defining features of the respective work-integrated learning models. The paper will conclude by making recommendations, to enable improvements to the existing three models.

The paper will begin by setting out some of the common definitions of work-integrated learning, available in academic literature.

DEFINITIONS OF WORK-INTEGRATED LEARNING

There are a number of definitions or models describing the concept of work-integrated learning. Martin (1997) tabulates a variety of these, which are used globally in the form of pre-course experience, sandwich courses, co-operative programs, cognitive apprenticeship or

job shadowing, joint industry courses, new traineeship and apprenticeships, placements or practicum, fieldwork, and post-course internship.

Work-integrated learning or experiential learning is a strategy of applied learning (learning integrated with work) which involves a structured educational program that combines productive relevant work experience with academic study and professional reflection (Du Pré, 2010).

Many career-focused higher education programs, in the traditional universities and universities of technology, include some form of workplace learning, in the form of industrial placements, job-shadowing, professional practice to support a professional qualification, traditional “sandwich” courses, specific skills training in particular professions, the theoretical application of practical experience in part-time professional courses and employer- or employment-based schemes, such as learnerships (Engel-Hills, et al., 2010).

According to Harvey, Geall and Moon (1998), work-integrated learning programs can be quite useful when they are strategically planned, organized and appropriately implemented. These curricula provide the perfect platform to create a hands-on learning experience for students as they develop a useful skill-set for today’s business environment. Zegwaard, Coll and Hodges (2003) call for a stronger integration of students’ technical and behavioral skills.

Reinhard and Singh (2011) agree with Zegwaard et al. (2003) and go further, stating that work-integrated learning programs should develop strong learning objectives and outcomes that reflect the views and needs of students, employers and professors. Engel-Hills et al. (2010) add that measurement and assessment against specified learning outcomes and assessment criteria are a pre-requisite to a qualification being appropriately accredited.

Students are likely to learn concepts in one semester that can be applied in the next semester at their partner companies; it is, therefore, important that the learning be practical, useful, and experiential (Reinhard, 2006b). These three values provide the core learning objectives of

work-integrated learning at the DHBW (DHBW Präsidium, 2011), which is based on Kolb's experiential learning model (Eames and Cates, 2011). Jarvis and Wilson (1999) add that the DHBW study model mirrors the key features of work-integrated learning. There is an overlap between what Martin (1997) refers to as co-operative and sandwich program models at the DHBW in Germany.

THE DEVELOPMENT OF COOPERATIVE EDUCATION IN GERMANY, SOUTH AFRICA AND NAMIBIA

Germany

The Duale Hochschule Baden-Württemberg (DHBW), known in English as Baden-Württemberg Cooperative State University, was a polytechnic-based state-run institution of higher education, founded in 1974 in Stuttgart, the capital of the German state of Baden-Württemberg. The DHBW study model was developed in response to a shortage of skilled workers in the state of Baden-Württemberg. It also provided an alternative to the traditional university system, which was vastly over-subscribed at the time. In addition, the typical graduate could demonstrate extensive experience in academic study, but had never experienced how this knowledge could be applied in the real world.

Three major employers in the state, Daimler-Benz, Bosch and SEL, in partnership with the state government, sought to address this problem actively, by developing a model based on work-integrated learning, which combines practical on-the-job training with a university qualification.

On 1 March 2009, the state of Baden-Württemberg changed the legal status of the DHBW, giving it the status of a state-run university. This change enabled the DHBW to unite its various locations under a central body, creating a university similar to the US-American university model. This structure allows synergies to be leveraged, while maintaining the

individual strengths of the respective locations and their connections to the regional businesses.

Today, nine main locations and three branch campuses, combined with a close network of over 10,000 partner companies, form the basis of the DHBW.

South Africa

The cooperative education model has existed in South Africa since 1979 (Du Pré, 2015). The technikons, otherwise known as universities of technology, implemented the cooperative education system in the 1970s and 1980s, with six months study time, and six months working time. The model was taken from the German universities of applied sciences (Du Pré, 2015). This system still operates in various guises. Some programs involve students doing work during vacation times; others integrate work experience into the academic year; others involve students spending a full year undertaking work-integrated learning.

Namibia

In Namibia the NUST established a Centre for Cooperative Education (CCE) in 2010 and adopted its first Cooperative Education Policy in 2011. The main activity of the CCE was to formalize the relationship between the institution and industry. At the university all undergraduate degree programs were reviewed and a curriculum framework model was introduced, making it mandatory for students to do work-integrated learning.

The Minister of Education appointed a National Core Working Group for cooperative education. This team was tasked with the drafting of a national strategy for cooperative education as well as the subsequent national policy. In 2013, a group of international experts were invited to Namibia to facilitate a discussion regarding the establishment of a national framework for cooperative education. All national stakeholders were involved and consulted and had representation on the working group. The group was extended to include the

Chamber of Commerce and Industry, Technical, Vocational Education and Training (TVET) sector, the Namibian Qualification Authority and the Ministry of Education.

COMPARISON OF THE DEFINING FEATURES OF THE THREE WORK-INTEGRATED LEARNING MODELS

Achieving Practical Experience

The DHBW works closely together with its partner companies to provide programs where the students alternate between attending classes at the university and working in industry. The benefit of alternating semesters between work and study is that the acquisition of practice and theory remains closely linked.

The situation in South Africa is somewhat different from that in Germany insofar as there are fewer industries to support the employment of students still in the process of studying for degrees and diplomas. Nevertheless, what is called work-integrated learning is part of the syllabus of most university of technology courses. Embedded in the nature of technology higher education is compulsory experiential learning, which provides students with relevant work experience. Students are required to undergo a period of on-the-job training as part of their degree studies.

Using the example of engineering students at CPUT in Cape Town, there is a requirement to spend their entire third year working in industry. At the end of this full-time year of work-integrated learning, they obtain a diploma. In order to be awarded a degree, they need to study for a fourth year at CPUT in the Faculty of Engineering.

The time required gaining work experience varies from a few weeks to a year, as in the example above, depending on the area of studies. ‘The principal advantage is that students gain experience in a professional field during their formal studies and begin working life with

knowledge of the marketplace, organizational structures and employers' expectations' (Du Pré, 2010).

At CPUT, the Centre for Community Engagement and Work Integrated Learning assists students in their quest to become more professionally competent, by providing the bridge between the university and opportunities for work experience in industry.

In Namibia, the domain of work-integrated learning was reserved for the traditional academic qualifications that include teacher education, nursing and engineering. With the introduction of the curriculum framework model, however, all undergraduate degrees need to include work-integrated learning with a minimum credit value of 10% of the total degree credits. The Namibian Qualification Framework (NQF) requires a bachelor's degree to have a minimum of 360 credits.

Operating in a post-colonial society, NUST in Windhoek, Namibia is able to use work-integrated learning to allow for initial access and exposure of students from a third-world economic context to the first-world experiences of companies.

Remuneration

Students at the DHBW in Germany receive a monthly salary for the duration of their studies (including theory semesters) and have the insurance status of employees, making the DHBW model a financially attractive means of completing their undergraduate studies.

At CPUT, South Africa, students gaining work experience in industry can be remunerated in three ways (Nofemela, 2015). Firstly, approximately 60% get a stipend from the company for which they work. Secondly, some work as volunteers (approximately 30%) and are satisfied to get the valuable work experience without financial reward. Thirdly, about 10% receive government grants from the Sector Education and Training Authorities (SETAs). The students do not receive a salary for the whole duration of their studies.

In South Africa many students additionally receive National Student Financial Aid Scheme (NSFAS) funding from the commencement of their studies.

Namibia faces the challenge of not having labor laws that recognize students in the workplace and as such students do not qualify for National Workman's Compensation or any national benefits of employees. In addition, as students gain access to employers as a condition for graduation (10% of the total degree credits must be allocated through work-integrated learning), employers have become reluctant to remunerate learners. A further challenge has been the student insurance cover through the academic institution. The stipulation of the current insurance policy is that all institutional and student indemnity will stop as soon as the industry partner pays the student any form of remuneration. The history of employment contracts and current labor laws allows for employers to claim legitimately that they are unable to remunerate students. A review of labor legislation produced national standards for work-integrated learning. These standards are currently being tabled in various national sectors for public comment.

Contracts of employment

A contract of employment with a DHBW partner firm is a pre-requisite to studying at the DHBW, meaning that all students have to meet both commercial and academic recruitment criteria. Provided that potential students meet the minimal academic requirements of the university, partner firms are free to use their own recruitment criteria and processes to assess and offer students a trainee position.

Students in the South African and Namibian models do not require a contract of employment from a company before they embark on their studies. Using the Namibian example, due to continuing employment discrimination against young black students, the requirement of a contract of employment as a condition of studying would mean that only a select few would be able to secure a place of study. As a public university, NUST is mandated by public

education policy to include previously disadvantaged communities in its student headcount. A contract of employment would, in effect, act as a barrier to achieving the inclusion of such students.

Academic Recognition

Bachelor degree programs at the DHBW attract 210 ECTS (European Credit Transfer System) credits, in contrast to the 180 credits offer by a standard university bachelor program. These additional credits reflect the professional experience element. Executive master programs were also introduced in 2011, in response to the desire of partner firms to offer part-time master studies, in order to retain talented graduates, who would otherwise go elsewhere to further their education. Due to the practical element of the bachelor program, DHBW students can continue their master's studies with one year further work experience after graduation.

Heinemann (1988) states that in 1984, the Cooperative Education Incorporating Internships Association commissioned an investigation, regarding the position of work-integrated learning in higher education. Although the growth and success of work-integrated learning were undisputed, the concern of the association was that the programs being offered would not be seen as intellectual and did not provide the level of standard expected of a university. Du Pré (2009) concurs with Heinemann (1988) and is of the view that in some instances it was thought that work-integrated learning programs were equivalent to high school curricula.

As the realization has dawned, backed up by statistics, that graduates from universities of technology are more employable than most graduates from traditional universities, respect, and therefore greater academic recognition for such programs incorporating work-integrated learning, have grown. Students have begun to recognize the benefits of work-integrated

learning, in particular its high standing in industry. Enrolments at the universities of technology are increasing compared with traditional universities.

The Role of Industry

The pool of partner companies, who employ and educate students at the DHBW in Germany, are drawn from a wide variety of commercial and industrial branches, which are in state and private ownership. The partner companies are geographically dispersed, transcending state and country boundaries. They play an essential role in shaping the DHBW study model, playing the role of equal partner to the state-run DHBW on all decision-making committees, exerting a strong, ongoing influence on curricula offered. The curriculum of the DHBW is matched to the skills required by industry. This match makes the students very attractive and marketable for employment after graduation (Reinhard, 2006a).

On the Local Governing Board of the DHBW, members of the university and partner companies are represented. Both parties hold equal decision-making powers on the content of new courses, admission of new partner companies and the formation of examination boards. This means that partner companies actively commit to shaping the future direction of the DHBW, which is the very essence of cooperative education.

The South African model is comparable to the DHBW model but not identical with it, the main reason being that there are not as many industries to support this kind of model.

As South Africa is in many ways still a developing country, there is not nearly as strong an industrial base as in Germany to support the kind of model found at the DHBW. However, as a long-term goal, moving in this direction is feasible due to the large number of foreign-owned companies which are operating in South Africa. For example, there are over 600 German companies trading in South Africa, employing over 90,000 individuals (German Embassy, Pretoria, 2015).

In addition, due to the revised Black Economic Empowerment Codes of 2013, companies are being forced to review their human resource policies, with regard to black workers. This may have the effect that companies will look to invest in their employees at an early stage in their academic career.

The establishment of community engagement partnerships, which include private companies, may be a vehicle through which universities of technology in South Africa can simultaneously meet a number of their work-integrated learning imperatives. 'It is possible for community engagement to have multi-stakeholder partnerships and that private companies' corporate social responsibility programs could have a more visible impact when implemented via a multi-stakeholder approach' (Nofemela & Nduna, 2013).

In Namibia, there are challenges to including industry in a model of work-integrated learning, in a developing country. There are a large number of employers in the 'informal' sector of the economy. Namibia has few registered companies which are willing to employ students, even in the third year of their studies, citing a variety of reasons including the risk of students in the workplace, confidentiality, cost and work readiness.

The role of Government as the largest employer in Namibia is also recognized and the national public sector human resource policy is currently being reviewed to make allowances for student placement in public institutions across the country. This in itself presents a huge opportunity for students as a minimum stipend is being proposed for students when they engage in work-integrated learning opportunities in the public sector.

An additional problem in Namibia is the mismatch between the role of higher education and the expectations of industry (Griesel & Parker, 2009). There needs to be a closer alignment between the attributes that employers consider important and expect graduates to have when entering the workplace environment. Focus should, therefore, be on encouraging

organizations to invest in work-integrated learning programs, to attract and retain high caliber graduate interns (Kanye & Crous, 2007; Eigsti, 2009).

In response to this problem, the Centre for Cooperative Education started running national workshops for industry and other higher education and training institutions in Namibia. This led to the identification of gaps in the current curriculum. The result is that each program curriculum must be revised by an appointed curriculum or program advisory board. This board is made up of industry representatives and the faculty responsible for the teaching and learning activities of the degree. The process of identifying the learning outcome for each course, for a specific program, as well as agreement with industry on the assessment strategy to be used, ensures greater relevance of the content of the degree as well as an appropriate level of assessment.

Employability and Job Security

Almost 90% of DHBW graduates are issued a permanent employment contract at the end of their studies and the partnering company that facilitates the student's employment is highly regarded among industry. The remaining 10% reflects the increasing trend of graduates choosing to pursue a master's degree, in addition to individuals taking a sabbatical year, embarking on travels or supporting charity organizations.

In South Africa graduates of work-integrated learning programs also frequently gain employment with the companies they worked for during their student years, as companies regard this as 'growing their own timber', often preferring to give a job to a graduate they have already worked with during their undergraduate years and helped train in the specific ways of the company. Traditional universities have only about 30% of students employed in their field in their first year after graduation, in contrast with 70-80% of graduates from universities of technology (Du Pré, 2015).

In Namibia, employment statistics, relating to graduates of work-integrated learning programs are not known. A national tracer study was commissioned for the 2011 national graduate cohort. The pilot study results will be available in 2015. There is, however, anecdotal evidence to suggest that the graduates of work-integrated learning programs have greater employment chances than graduates of the traditional university system, due to exposure to the workplace environment.

Teaching in a Work-Integrated Learning Environment

Full-time professors, lecturers from partner universities and technical colleges, and highly qualified specialists from partner companies and social institutions, contribute to teaching at the DHBW. All lecture within their field of competence, delivering cutting-edge expertise and up-to-date knowledge to the DHBW students. This ensures a high level of academic as well as practice-oriented teaching. The DHBW's close relationship with experts and partner firms also provides opportunities for research projects.

In South Africa, there is a move towards engaging experts from the field of industry to lecture students. However, this is occurring on a limited scale. One example at CPUT is the creation of a marketing association, which attracts experts from industry, who provide evening lectures in an informal setting to students.

The use of industry practitioners to lecture in Namibia has led to challenges in the understanding and execution of educational learning outcomes. Some individuals lacked the requisite pedagogic skills. In response, NUST has embarked on the development of a Post Graduate Certificate of Teaching and Learning in Higher Education. It is nonetheless important that a lecturer can step outside of the classroom and into the world of work, to enable understanding of the theory in the practical context.

The Role of Research in Work-Integrated Learning

The DHBW was given the brief to realize cooperative research projects upon its change in status to a state-run university (Reinhard, Osburg & Townsend 2010). Collaboration with partner companies was intensified, with the effect that research outcomes made academic content more up-to-date. All research up to this date was achieved through the efforts of professors at the DHBW in gaining sponsorship from partner companies and research bodies (Reinhard, Osburg & Townsend, 2008). Through its increasing research activities, the DHBW is in a position to cooperate with partner universities and companies across the globe, particularly in international research partnerships, as demonstrated with the writing of this academic paper. Research is also a particularly effective means of delivering work-integrated learning to DHBW students, due to the dovetailing of study and work in the curriculum.

Research in South Africa was seen, in the past, as the domain of traditional universities. Since the technikons have been given the status of universities of technology, a strong research drive has developed, primarily in the field of applied research. CPUT, for example, has a Research Directorate, which provides support to academics in a variety of ways, including attending conferences, and turning conference papers into publishable articles.

Research in the Namibian context is very much at an early stage in its development. It focuses on the need for academic intervention, as well as the formulation of multi-disciplinary research teams, in order to integrate academic research with the work-integrated learning experience. The formulation of student research and development teams (SRDT), coupled with industry partnerships, is being piloted. The aim of the SRDT is to tackle industry problems in the form of a research project. This approach has assisted the university in gaining new insights and thereby enhancing teaching and learning through a problem-based teaching approach.

CONCLUSION

When considering the development of work-integrated learning in Germany, South Africa and Namibia, with specific reference to the three target institutions, cooperative education has a long tradition in the former two countries. In contrast, Namibia is very much in the developmental stage. The three models state the importance of practical experience, coupled with academic qualifications in higher education. The principal difference between the three study models is a more standardized approach in Germany, where undergraduate students divide their time equally between the university and partner companies.

In South Africa and Namibia, certain degree programs traditionally could more readily enable work experience, such as in the field of engineering. The opportunities for undertaking a period of on-the-job training are still limited for other degree courses. Both CPUT and NUST now have minimum requirements, regarding work experience. This is effectively closing the gap between the DHBW and the two African models.

In the context of contracts of employment, as a pre-requisite to study in higher education, this element would only be feasible in the South African and Namibian models, when there is a more standard approach to gaining practical experience during the course of a degree program.

Referring to remuneration, all three institutions offer some form of remuneration, whether that be through financial support from industry or government funding. Remuneration is a key success factor for cooperative education as the lack of funding can be a barrier to higher education, particularly for individuals from racially disadvantaged groups. There is also a positive correlation between remuneration, originating from industry and the level of commitment from industry, providing work experience for students during their degree program. Using the example of Namibia, the on-going review of labor legislation will address the challenge of student recognition in the workplace and thus enable a more industry-focused remuneration of its students.

The fact that all three institutions discussed in this paper have been elevated in recent years to the status of a university has greatly helped in achieving the necessary commitment from the various stakeholder groups. In addition, the graduates emerging from these work-integrated learning programs are viewed as more employable than traditional university graduates, due to the practical element of their studies and, therefore, have a greater degree of job security on graduation.

The role of industry in the success of the DHBW study model has demonstrated the importance of industry, as an equal partner in the decision-making and shaping of the degree programs, ensuring a learning outcome that is tailored to the needs of local industry. In South Africa, the establishment of community engagement partnerships will certainly increase commitment from local industry, in a multi-stakeholder approach, to developing a tailored model of work-integrated learning. While Namibia faces the challenge of a large informal sector of the economy, which acts as a barrier to industry commitment, the role of government, as an employer, can be leveraged in order to provide opportunities for practical experience in public institutions. The role of government, as an employer, could act as a role model for further involvement for private enterprises in the future. The existence of program advisory boards at NUST will also assist in enabling industry to take a more active role in work-integrated learning in higher education. Furthermore, the practice of engaging experts from industry to lecture students is another means of obtaining industry buy-in and ensuring the practical relevance of the learning outcome. The experience of NUST, in particular, shows the need to implement measures to ensure quality teaching from industry.

Bearing in mind the scope and opportunities for implementing changes to a model of cooperative education, there is consensus that the process should be conducted carefully and that the benefits to industry and the economy will not be felt in the short term. In the words of

Christine Winberg (2004:44), ‘universities of technology do not offer quick fix solutions to national industries’ lack of competitiveness; and they cannot transform a low skills society into a high skills one overnight’. However, with the inspiration of the DHBW model (Germany), both CPUT (South Africa) and NUST (Namibia) in partnership with the German institution, are continuing to develop their cooperation with industry to improve the employability of their graduates.

REFERENCES

- Duale Hochschule Baden-Württemberg, Präsidium (2011). *Kurzbeschreibung Qualitätsmanagementsystem*. Stuttgart, Germany: DHBW Stuttgart.
- Du Pré, R.H. (2009). The place and role of Universities of Technology in South Africa, Durban: Durban University of Technology.
- Du Pré, R.H. (2010). Universities of Technology in the context of the South African higher education landscape. *Universities of Technology: Deepening the Debate. Kagisano*, 7, pp. 1-41.
- Du Pré, R.H. (2013). “Hitting the ground running”: Work-integrated Learning and Skills Development in South Africa. *International Business and Economics Discussion Papers*, 1, pp. 92-107.
- Du Pré, R.H. (2015). Interview with former Vice-chancellor, Durban University of Technology by R. Townsend. 2 March.
- Eames, C., & Cates C. (2011). International Handbook for Cooperative and Work-Integrated Education (2nd ed.). Lowell, MA: World Association for Cooperative Education.
- Eigsti, J.E. (2009). Graduate nurses’ perceptions of a critical nurse internship programme. *Journal for nurses in staff development*, 25 (4), 191-198.

- Engel-Hills, P., Garraway, J., Jacobs, C., Volbrecht, T., & Winberg, C. (2010). Working for a degree: work-integrated learning in the higher education qualifications framework. *Universities of Technology: Deepening the Debate. Kagisano*, 7, pp. 62-88.
- German Embassy Pretoria (2015). German companies in South Africa. Retrieved from: http://www.southafrica.diplo.de/Vertretung/suedafrika/en/06__Economy/1__Ger__SA/Ger__Comp.html
- Griesel, H., & Parker, B. (2009). Graduate attributes: A baseline study on South African graduates from the perspective of employers. Pretoria: Higher Education South Africa & the South African Qualifications Authority.
- Harvey, L., Geall, V., & Moon, S. (1998). Work experience: Expanding opportunities for undergraduates. Birmingham, UK: Centre for Research into Quality, University of Central England.
- Heinemann, H. (1988). Cooperative education and the academy. *Asia Pacific Journal of Cooperative Education*, 24(2-3), 109-119.
- Jarvis, P., & Wilson, A.L. (1999). International dictionary of adult and continuing education (2nd ed.). London: Kogan Page.
- Kanye, B., & Crous, F. (2007). Graduate interns' experiences: A career success orientations approach. *SA Journal of Industrial Psychology*, 33(3), 84-93.
- Martin, E. (1997). The Effectiveness of Different Models of Work-based University Education. Department of Employment, Education, Training and Youth Affairs J.S., McMillan Printing Group.
- Nofemela, F. (2015). Interview with Manager for Cooperative Education, CPUT by R. Townsend. 5 March.

- Nofemela, F.R., & Nduna, N.J. (2013). Community Engagement through a Multi-stakeholder Partnership: A South African Perspective of the Bridge to Employment (BTE) Programme. Unpublished paper based on SATN Conference.
- Reinhard, K. (2006a). Berufsakademie in Germany: Can this work-integrated learning program serve as an effective model in higher education institutions in western and eastern countries? *Asia Pacific Journal of Cooperative Education*, 7(1), 16-21.
- Reinhard, K. (2006b). The role of business and industry in supporting education: Case studies from the United States and Germany, in Educational Sponsorship – an option for IT-educational funding. *Journal for Global Business Education*, 6, 43-50.
- Reinhard, K., Osburg, T., & Townsend, R. (2008). The sponsoring by industry of Universities of Cooperative Education: Case study in Germany. *Asia Pacific Journal of Cooperative Education*, 9(1), 1-13.
- Reinhard, K., Osburg, T., & Townsend, R. (2010). Introducing corporate social responsibility as component in cooperative education: Results from a student research project in Germany and the United States supported by Intel Corporation. *Asia Pacific Journal of Cooperative Education*, 11(1), 1-12.
- Reinhard, K., & Singh, S. (2011). An archetype of WIL in information technology at Baden-Württemberg Cooperative State University Ravensburg, Germany. In Keleher, P., Patil, A., & Harreveld, R.E. (Eds). *Work-Integrated learning in engineering and technology: new approaches and practices*. Hershey, Pennsylvania: IGI.
- South African History Online (2014). Liberation Struggle in South Africa: Apartheid and Reactions to it. Retrieved from: <http://www.sahistory.org.za/article/apartheid-and-reactions-it>
- Winberg, C. (2004). Becoming a University of Technology. *Sediba sa Thuto: Academic Journal of Vaal University of Technology*, 1, pp. 38-54.

Zegwaard, K., Coll, R.K., & Hodges, D. (2003). Assessment of workplace learning: A framework. *Asia Pacific Journal of Cooperative Education*, 4(1), 9-18.