A comparative study of cooperative education and work-integrated learning in Germany, South Africa, and Namibia

KARIN REINHARD[1]
ANNA POGRZEBA
Baden-Wuerttemberg Cooperative State University, Ravensburg, Germany
ROSEMARY TOWNSEND
Cape Peninsula University of Technology, Cape Town, South Africa
CARVER ALBERTUS POP
*Namibia University of Science and Technology,*Windhoek, Namibia

The Baden-Wuerttemberg Cooperative State University was the first higher education institution in Germany to combine on-the-job training and academic studies. The study model integrates theory and practice, both being components of cooperative education. The success of this university is based on its cooperation with over 10,000 companies. Students are employed and remunerated for the duration of their studies by their partner company. In South Africa and Namibia, while cooperative education programs have a rich history, the study models developed lack the commitment from industry to invest in work-integrated learning. The present study models involve students taking up unpaid practical semesters, in order to achieve the transfer of theoretical knowledge into a practical work-related setting. This comparative study outlines how universities of higher education, in Germany, South Africa and Namibia, in cooperation with industry, can further develop their model, in order to achieve financial stability and employment security for their students. *(Asia-Pacific Journal of Cooperative Education, 2016, 17(3), 249-263)*

Keywords: Work-integrated learning, comparative cooperative education, South Africa, Namibia, Germany

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, 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 set out some of the common definitions of cooperative education and work-integrated learning, available in academic literature. It will then compare the defining features of the respective work-integrated learning models. The authors will conclude by making recommendations, to enable improvements to the existing three models. The paper will begin by detailing 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).

[1] Corresponding author: Karin Reinhard, reinhard@dhbw-ravensburg.de

BACKGROUND TO THE STUDY

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 (DHBW Präsidium, 2011).

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). The 216 universities of applied sciences in Germany are an alternative system to the DHBW study model (Statistisches Bundesamt, 2015). Students typically spend up to two semesters, during the course of their studies, gaining practical experience. Other South African models can involve students doing work during vacation times integrating work experience into the academic year, or spending a full year undertaking work-integrated learning.

Namibia

The Namibia University of Science and Technology (NUST) is the only university in Namibia offering work-integrated learning. 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.

RELEVANT LITERATURE IN THE FIELD 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). It is often viewed as an umbrella term to capture the various elements of practical-based education, such as cooperative education, which is characterized by a planned series of practical experiences, where the individual takes on "progressive responsibility" and has the opportunity to apply theoretical knowledge in a practical setting (Groenewald, 2004).

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. The relationship between these three stakeholder groups is a key element of cooperative education. 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 cooperative education at the DHBW (DHBW Präsidium, 2011), which are 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 cooperative and sandwich program models at the DHBW in Germany.

Elements of the DHBW study model also reflect the key components of Groenewald's cooperative education system model, which are "learning content", "learner", "learning environment", and "lecturer" (Groenewald, Drysdale, Chiupka & Johnston, 2011).

THE DEVELOPMENT OF A COMPARATIVE FRAMEWORK

This study is a discussion paper, within the field of comparative cooperative education. Research within comparative cooperative education can be achieved through qualitative or quantitative methods. Quantitative research is used to prove a hypothesis or theory, using statistical analysis. However, the qualitative approach, as opposed to a quantities approach, was seen to have a better methodological fit to the aims of the discussion paper, as the authors were aiming to show similarities and differences in the three study models, as well as identify recommendations to provoke further debate on the subject of cooperative education and work-integrated learning in the participating countries. In addition, the qualitative approach enabled a more descriptive picture of the situation to be gained, which allowed a far richer interpretation of the facts (Eames, 2011).

Certain advantages were accrued by taking a qualitative approach. The role of local culture and politics has an impact on the models of cooperative education and work-integrated learning established in the three target countries. The qualitative approach allowed potential bias and false assumptions to be avoided, which can often be the case when analyzing purely quantities data, without due regard to the differing cultural contexts (Fairbrother, 2007).

Furthermore, the methodology draws on example-based case studies in order to extract the required information for a comparative study on cooperative education and work-integrated learning. Cooperative education is a flexible system of education, which can be established in a variety of cultures and is not restricted to developed nations, as in Germany. The three countries were selected due to their contrasting cultures and different levels of economic and social development. More specifically, the three participating universities were selected as follows: the DHBW is long-established and operates in a developed economy. The CPUT is also long-established, but operates in a developing economy. The NUST study model of cooperative education is a relatively new offering and the only one of its kind in Namibia, operating in a developing economy. The three participating universities also have a long-standing relationship, in terms of staff and student exchange.

The study models of the three respective institutions are, as a result, so different that there exists no common base of comparison. The authors used long-established research methods drawn from the area of comparative educational science. This included principally the identification of "analogue phenomena" (Froese, 1983), which serve to form the base of the comparative study. These analogue phenomena reflect the reality of the situation. The identification of the analogue phenomena includes two phases; the first phase being to describe, understand and interpret the situation. Next, the second phase is the categorization and alignment of the various factors, resulting in the development of the framework, followed by the use of comparative methodologies to arrive at conclusions (Zabeck, 1966).

The authors selected the German model as a base point for the study, due to the DHBW study model having the longest history and the German contingent's long-standing involvement with and commitment to the DHBW model. In addition, the DHBW study model offers students and industry a more comprehensive cooperative education element, compared to South Africa and Namibia, thus giving the study more comparative breadth.

An inherent risk associated with comparative studies is the tendency to view one of the cases as being inferior to the others (Azarian, 2011). The authors have endeavored to prevent a situation, which would elevate the merits of the German study model above those of the South African and Namibian models.

The DHBW study model was examined in detail; the information being gained through the extensive experience of the German contingent and literature pertaining to the DHBW. Leading from this process, analogue phenomena, in the form of defining features, were used by the authors to develop a framework for comparative work-integrated learning. The defining features of cooperative education, developed by the authors of this study, are illustrated in the following framework (Figure 1).

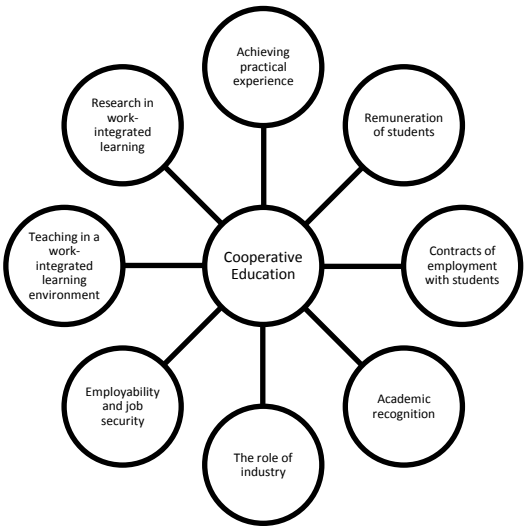

FIGURE 1: Framework of defininings features of cooperative education

This framework was found to be largely in alignment with Groenewald's cooperative education system model (Groenewald et al., 2011). In terms of "learning content", the features of research in work-integrated learning and academic recognition were seen as key success factors in cooperative education in higher education. Achieving practical experience was closely aligned, but not exclusive to the "learner" element. When considering the "learning environment", remuneration, contracts of employment with students, the role of industry and employability and job security were considered important on the basis that many systems of cooperative education struggle to appreciate the importance of these features in achieving a successful learning outcome. The relevance of teaching in a work-integrated learning environment, in terms of delivering content through individuals from both academia and industry, covers the "lecturer" element well.

The co-authors in South Africa and Namibia were tasked to compare and contrast the defining features of the framework, in the context of their respective institutional study models. This was achieved likewise through the extensive experience of the South African and Namibian contingent in addition to drawing on available literature from the two countries.

In the resulting analysis, the authors were able to make recommendations, based on the framework, to enable improvements to the existing three models.

DISCUSSION BASED ON THE COMPARATIVE FRAMEWORK

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 of Students

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 with Students

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 be accrued through a multi-stakeholder partnership approach. Private companies'corporate social responsibility programs could have a more visible impact when drawing on the input of multiple stakeholders (Nofemela & Nduna, 2013).

In Namibia, there are challenges to including the industry 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 curriculation 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 2016. 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.

The comparison of the defining features, based on the framework derived from this study are summarized in the Table 1.

TABLE 1: Comparison of the defining features of the three institutions

Defining Feature	DHBW	CPUT	NUST
Achieving practical experience	Alternating semesters between work and study with the same employer	Compulsory experiential learning and on-the-job training, internships	Work-integrated learning placements
Remuneration of students	Monthly salary	Stipend or voluntary work or governments grants	Current labor laws do not facilitate the remuneration of students
Contracts of employment with students	Pre-requisite to obtaining a study place, contract between partner firm and student	None	None
Academic recognition	210 ECTS points, of which 30 ECTS points reflect the cooperative education element	Work-integrated learning element is compulsory, but is not specifically awarded credits	Standing in industry is growing
The role of industry	Partner firms support students for the duration of their studies, membership of local governing board, influence on curricula, equal decision-making powers	Existing industry base not strong enough to support work-integrated learning model, future opportunities with foreign-owned companies being explored, community engagement partnerships	Informal sector of the economy and government sector
Employability and job security	90% of students gain a permanent contract of employment on graduation, mostly with their partner firm	70-80% of students are in employment in their first year after graduation, often employed by companies they worked for during their studies	Statistics not available
Teaching in a work-integrated learning environment	Full-time professors, lecturers from partner universities and technical colleges, specialists from partner firms and social institutions	Engagement of experts from the field of industry is growing, but still limited in its scale	Development of post graduate certificate of teaching and learning in higher education for industry practitioners
The role of research in work-integrated learning	Collaboration with partner firms involving students and academic staff, applied research	Strong research drive in field of applied research	Early stage of development, research with industry partners is being piloted

CONCLUSIONS AND RECOMMENDATIONS

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 at the DHBW, where undergraduate students divide their time equally between the university and partner companies. This is in alignment with what Martin (1997) refers to as cooperative and sandwich program models.

When looking at the level of integration of cooperative education and work-integrated learning on a scale of one to ten, with ten being the most developed and one the least, the DHBW operates at the higher end of the scale (ten), with CPUT in the middle (four to six) and the NUST at the lower end (two to three). Using the example of NUST, the cooperative element fits with what Groenewald et al. (2011) refer to in their taxonomy of work-integrated learning as service and community-based learning, which takes the form of placements in both the 'informal' sector of the economy and the national public sector. In contrast, the CPUT focuses on experiential work-integrated learning in the form of community engagement partnerships, internships, professional practicum, and post-course internships, as well as cooperative education programs (Groenewald et al., 2011; Zegwaard et al., 2003). The DHBW, on the other hand, offers an exclusively industry-focused cooperative education experience.

In South Africa and Namibia, certain degree programs can 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, p. 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

Azarian, R. (2011). Potentials and Limitations of Comparative Method in Social Science. *International Journal of Humanities and Social Science, 1*(4), 113-125.

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, South Africa: 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, 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, 92-107. Retrieved from http://www.ravensburg.dhbw.de/fileadmin/Ravensburg/Dokumente_Bilder_Contentbereich/International_Business/DHBW_RV_IB_IBE_Vol._1_Final_2.pdf#page=92

Eames, C. (2011). Researching in cooperative education: How a practitioner met the challenge. In: P. L. Linn, A. Howard, & E. Miller (Eds). *Handbook for research in cooperative education and internships* (pp. 71-97). Mahwah, NJ: Lawrence Erlbaum Associates

Eames, C., & Cates C. (2011). Theories of learning in cooperative and work-integrated education. In: R. K. Coll & K. E. Zegwaard (Eds.), *International handbook for cooperative and work-integrated education: International perspective of the theory, research and practice* (pp. 41-52). 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, 62-88.

Fairbrother, G. P., (2007). Quantitative and qualitative approaches to comparative education. In: M. Bray, B. Adamson, & M. Mason (Eds). *Comparative education research: Approaches and methods* (pp. 39-62). Berlin, Germany: Springer

Froese, L., (1983) Bildungstrukturen in Ost und West. In Froese, L. *Ausgewählte studien zur vergleichenden erziehungswissenschaft. Positionen und probleme.* Muenchen: IGI.

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, South Africa: Higher Education South Africa & the South African Qualifications Authority.

Groenewald, T. (2004). Towards a definition for cooperative education. In: R. K. Coll & K. E. Zegwaard (Eds.), *International handbook for cooperative education: An international perspective of the theory, research and practice of work-integrated learning* (pp. 17-25). Boston, MA: World Association for Cooperative Education.

Groenewald, T., Drysdale, M., Chiupka, C., & Johnston, N. (2011). Towards a definition and models of practice for cooperative and work-integrated education. In: R. K. Coll & K. E. Zegwaard (Eds.), *International handbook for cooperative and work-integrated education: International perspective of the theory, research and practice* (pp. 17-24). Lowell, MA: World Association for Cooperative Education.

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, UK: 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.

Nofemela, F. R., & Nduna, N. J. (2013, October). *Community engagement through a multi-stakeholder partnership: A South African perspective of the bridge to employment (BTE) programme*. Paper presentated at the SATN Conference, Pretoria, South Africa.

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: P. Keleher, A. Patil, & R. E. Harreveld (Eds). *Work-Integrated learning in engineering and technology: new approaches and practices* (pp. 245-255). Hershey, PA: IGI.

Statistisches Bundesamt. (2015). Anzahl der Hochschulen in Deutschland im Wintersemester 2015/2016 nach Hochschulart. In *Statista - Das Statistik-Portal*. Retrieved from http://de.statista.com/statistik/daten/studie/247238/umfrage/hochschulen-in-deutschland-nach-hochschulart/

Winberg, C. (2004). Becoming a University of Technology. *Sediba sa Thuto: Academic Journal of Vaal University of Technology, 1,* 38-54.

Zabeck, J. (1966). Ansätze einer Vergleichenden Berufs-und Wirtschaftspädagogik. In: K. Abraham, A. Dörschel, & K. Herberts (Eds). *Jahrbuch für Wirtschafts-und Sozialpädagogik* (pp. 207-213). Heidelberg: Quelle & Meyer.

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

Asia-Pacific Journal of Cooperative Education
ISSN 1175-2882
www.apjce.org

About the Journal

The Asia-Pacific Journal of Cooperative Education publishes peer-reviewed original research, topical issues, and best practice articles from throughout the world dealing with Cooperative Education (Co-op) and Work-Integrated Learning/Education (WIL).

In this Journal, Co-op/WIL is defined as an educational approach that uses relevant work-based projects that form an integrated and assessed part of an academic program of study (e.g., work placements, internships, practicum). These programs should have clear linkages with, or add to, the knowledge and skill base of the academic program. These programs can be described by a variety of names, such as cooperative and work-integrated education, work-based learning, workplace learning, professional training, industry-based learning, engaged industry learning, career and technical education, internships, experiential education, experiential learning, vocational education and training, fieldwork education, and service learning.

The Journal's main aim is to allow specialists working in these areas to disseminate their findings and share their knowledge for the benefit of institutions, co-op/WIL practitioners, and researchers. The Journal desires to encourage quality research and explorative critical discussion that will lead to the advancement of effective practices, development of further understanding of co-op/WIL, and promote further research.

Submitting Manuscripts

Before submitting a manuscript, please unsure that the 'instructions for authors' has been followed (www.apjce.org/instructions-for-authors). All manuscripts are to be submitted for blind review directly to the Editor-in-Chief (editor@apjce.org) by way of email attachment. All submissions of manuscripts must be in Microsoft Word format, with manuscript word counts between 3,000 and 5,000 words (excluding references).

All manuscripts, if deemed relevant to the Journal's audience, will be double-blind reviewed by two or more reviewers. Manuscripts submitted to the Journal with authors names included with have the authors' names removed by the Editor-in-Chief before being reviewed to ensure anonymity.

Typically, authors receive the reviewers' comments about 1.5 months after the submission of the manuscript. The Journal uses a constructive process for review and preparation of the manuscript, and encourages its reviewers to give supportive and extensive feedback on the requirements for improving the manuscript as well as guidance on how to make the amendments.

If the manuscript is deemed acceptable for publication, and reviewers' comments have been satisfactorily addressed, the manuscript is prepared for publication by the Copy Editor. The Copy Editor may correspond with the authors to check details, if required. Final publication is by discretion of the Editor-in-Chief. Final published form of the manuscript is via the Journal website (www.apjce.org), authors will be notified and sent a PDF copy of the final manuscript. There is no charge for publishing in APJCE and the Journal allows free open access for its readers.

Types of Manuscripts Sought by the Journal

Types of manuscripts the Journal accepts are primarily of two forms; *research reports* describing research into aspects of Cooperative Education and Work Integrated Learning/Education, and *topical discussion* articles that review relevant literature and give critical explorative discussion around a topical issue.

The Journal does also accept *best practice* papers but only if it present a unique or innovative practice of a Co-op/WIL program that is likely to be of interest to the broader Co-op/WIL community. The Journal also accepts a limited number of *Book Reviews* of relevant and recently published books.

Research reports should contain; an introduction that describes relevant literature and sets the context of the inquiry, a description and justification for the methodology employed, a description of the research findings-tabulated as appropriate, a discussion of the importance of the findings including their significance for practitioners, and a conclusion preferably incorporating suggestions for further research.

Topical discussion articles should contain a clear statement of the topic or issue under discussion, reference to relevant literature, critical discussion of the importance of the issues, and implications for other researchers and practitioners.

Asia-Pacific Journal of Cooperative Education
ISSN 1175-2882
www.apjce.org

EDITORIAL BOARD