



Work-Integrated Learning: Good Practice Guide

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FOREWORD

The Higher Education Quality Committee (HEQC) in 2002, in the context of developing the national quality assurance system, established a project to foreground the core function of teaching and learning in the context of the restructuring of higher education. Subsequently it published the Improving Teaching and Learning Resource (March 2005) as part of its prioritisation of quality issues in teaching and learning. Since then, there have been a number of teaching and learning related publications that have served to increase the level of national and institutional debates on the conceptualisation, quality and practice of teaching and learning. Examples of such publications include, Service-Learning in the Curriculum: A Resource for Higher Education Institutions (2006), A Good Practice Guide and Self-evaluation Instruments for Managing the Quality of Service-Learning (2006), Higher Education Monitor: A Case for Improving Teaching and Learning in South African Higher Education (2007), Case studies on dealing with “pipeline students” within their respective institutions (2007), Service-Learning in the Disciplines: Lessons from the Field (2008), and Higher Education Monitor: Access and Throughput in South African Higher Education - Three case studies (2010).

A central feature of the HEQC’s approach since its inception has been to initiate and facilitate quality-related capacity development activities in a collaborative manner across a range of areas in higher education, including the practice of teaching and learning. The quality promotion and capacity development activities for the South African higher education sector have included the conducting of large dedicated projects in selected areas, workshops, training sessions, seminars, and publications.

This publication, Work-Integrated Learning: A Guide for Higher Education Institutions, is intended to assist those involved in programme development and in the curriculum development and adaptation required by the Higher Education Qualifications Framework (October 2007). It also aims to prompt other academics who are involved in teaching to consider the educational purpose and role of work-integrated learning in teaching and learning. As the authors argue, “University teachers should be concerned to ensure that the students that graduate from their programmes are prepared for the world in which they will live and work.” The publication provides a theoretical foundation for work-integrated learning while making use of a large number of local and international case studies for illustration and example.

The authors, contributors and reviewers are thanked for producing this publication within a short time-frame. The comprehensiveness of its content and the care taken by the authors to make the topics accessible to the reader is greatly appreciated. A word of appreciation is extended to Ms Bella Sattar who initially took charge of the project, and to Professor Chris Winberg who subsequently coordinated the writing of the manuscript to its completion. The Programmes and Qualifications Committee of the South African Technology Network is thanked for the initial idea to produce this publication. The CHE hereby expresses its gratitude to Professor Anthony Staak, of the South African Technology Network, for overseeing the submission of the draft document.

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CHAPTER ONE

INTRODUCTION AND BACKGROUND

1.1 Purpose and overview of the guide

There is considerable interest, both in South Africa and internationally, in curricular and pedagogical reform that will both support students from diverse backgrounds and prepare them for the challenges of the global economy and responsible citizenship. Governments around the world are concerned that universities make the highest possible contribution to students' 'graduateness' in various forms. Programmes that promote graduates' successful integration into the world of work and that enable graduates to make meaningful contributions in contexts of development, require innovative curricular, teaching, learning and assessment practices. South African universities' commitment to positive graduate outcomes, global citizenship and community engagement add extra dimensions to the importance of WIL in curriculum design and development, as a process of reciprocal involvement that can benefit students, professions, workplaces and communities. This guide to work-integrated learning (WIL) was produced to assist academic staff to address these issues in their different programmes and disciplines.

The guide was produced in the context of the promulgation of the Higher Education Qualifications Framework (HEQF) and processes of national curriculum review. The HEQF proposes six higher education levels (Levels 5 – 10), with different qualifications requiring appropriate credits at different levels. Thus the guide also intends to assist academic staff, particularly those where existing programmes are undergoing revision, in developing appropriate forms of WIL for different levels of the HEQF. It is thus the purpose of this Improving Teaching and Learning (ITL) resource to provide university teachers with a guide to planning, implementing and managing good WIL practice. To this end the guide is divided into seven sections:

- 1) Introduction to WIL,
- 2) A conceptual framework for WIL,
- 3) Curriculum design and development for WIL,
- 4) Teaching and Learning for WIL,
- 5) Assessment for/of WIL,
- 6) Partnerships for WIL, and
- 7) The management of WIL.

These sections include case studies of innovative practice in WIL. There is a glossary of terms that includes hyperlinks to a number of resources which are useful for the implementation of WIL, as well as a WIL bibliography.

1.2 Who is this guide for?

This guide is intended for university teachers who teach on career-focused and professional programmes. In this guide we use the term ‘university teacher’ to describe academic staff in their roles as teachers. The term ‘university teacher’ includes tutors, lecturers, senior lecturers, professors, and postgraduate supervisors. This guide is intended for those who teach on traditional professional programmes, such as architecture, law and medicine, for those who teach on programmes in the new or emerging professions, such as mechatronics, software engineering, reconfigurable computing, robotics, and cellular technology, as well as for those teaching career-focused programmes such as tourism, business informatics, and media studies. In the interests of brevity in this guide, we refer to teaching on all advanced technical, advanced vocational, new and traditional professional programmes as ‘professional education’.

1.3 Defining work-integrated learning

As a means of addressing concerns around student development and graduate attributes, there has been interest in fostering university learning that is less didactic and more situated, participative, and ‘real world’ oriented. In this guide, this kind of learning is termed WIL. WIL is used as an umbrella term to describe curricular, pedagogic and assessment practices, across a range of academic disciplines that integrate formal learning and workplace concerns. The integration of theory and practice in student learning can occur through a range of WIL approaches, apart from formal or informal work placements. WIL is primarily intended to enhance student learning, and to this end several innovative curricular, pedagogical and assessment forms have developed in response to concerns about gradueness, employability and civic responsibility; examples include: action-learning, apprenticeships, cooperative education, experiential learning, inquiry learning, inter-professional learning, practicum placements, problem-based learning, project-based learning, scenario learning, service-learning, team-based learning, virtual or simulated WIL learning, work-based learning, work experience, workplace learning, and so on (see the glossary at the end of this resource for definitions of these and other terms used). Although the terminology used to describe programmes and practices varies, all are based on a common understanding of the importance of enabling students to integrate theoretical knowledge gained through formal study, with the practice-based knowledge gained through immersion in a work or professional context. The term WIL, then, specifically describes an approach to career-focussed education that includes classroom-based and workplace-based forms of learning that are appropriate for the professional qualification. What distinguishes WIL from narrow conceptions of learning-for-work is the emphasis on the integrative aspects of such learning. WIL could thus be described as an educational approach that aligns academic and workplace practices for the mutual benefit of students and workplaces; in this regard, WIL should demonstrably be appropriate for the qualification concerned.

It is worth emphasising that the alignment between work and education implied in WIL is not restricted to work placement. There are many different WIL practices along a continuum from more theoretical to more practical forms. WIL includes, but is not limited to, learning from experience. When WIL includes workplace learning, the intention is to encourage students to reflect on their experiences and develop and refine their own conceptual understanding. These capabilities are just as necessary for general education as they are for career-focused education.

The case study below is an example of WIL in a medical education curriculum. Traditionally, medical practitioners were taught through formal lectures in anatomy, physiology, medicine, and so on. They would then undergo practical training in the clinical environment, under the supervision of an expert practitioner. Taking a more integrated approach to medical education (one that attempts to integrate theory with practice) a curriculum innovation was developed:

Case study 1: A new curriculum for medical practitioners

Description: In the new curriculum, the medical students study ‘cases’ rather than academic subjects. Cases are scenarios or vignettes that are derived from clinical settings. For students in the earlier years of study, the cases are more likely to be scenarios than problems-to-be-solved, as students do not yet have sufficient knowledge to solve clinical problems. As students progress through the curriculum they are increasingly given cases that are authentic clinical problems-to-be-solved. The cases are the vehicle by which students acquire the knowledge, skills and attitudes that make up the curriculum objectives and lay the foundations for learning in the Apprenticeship Model adopted in the clinical years. This reflects the horizontal and vertical integration of curriculum objectives. Consistent with the relevance requirement of the new curriculum, the main criterion for selecting cases is the prevalence of health needs in the South African or African contexts. The cases, supporting activities, and curriculum objectives encompass the core knowledge of a generalist graduate who is competent to practice at the three levels of the South African health care system. Hence design teams and teaching staff are requested to avoid including unusual or unique conditions when discussing the cases and providing support activities. Expansion of the core to the unusual or unique is addressed in postgraduate studies. In the clinical years there are some serious conditions that may not be common, but that students need to recognise for referral.

The cases are written by curriculum design teams consisting of the participating disciplines relevant to the particular course. In the first two semesters the cases are theme based, e.g., life cycle and transitions in health. In semesters 3 to 5, the cases are body systems-based, e.g., the cardio-vascular system. All cases have been written in order to encourage students to integrate clinical, basic health, psycho-social as well as Public Health Science concepts, questions, problems and themes and issues. The scope and depth of integration varies between cases, semesters and year levels.

HEQF Levels: 5-8

Resources: Learning happens in small groups, in seminar or tutorial rooms. The small group discussions of cases are augmented by supporting activities and resources, for example: lectures, tutorials, practicals, prescribed readings, recommended readings, e-learning, etc. that provide varying degrees of support to the cases. Every effort is made to provide the support activities timeously for students to benefit from and apply in their case session discussions.

Source: Hartman, Aplerstein & Grossman, 2005.

Case Study 1 is an example of problem-based learning (sometimes known as case-based learning in medical education); its advantage is that, even at an early stage of learning, students are oriented towards the world of work. This orientation is carefully structured to ensure that students learn basic knowledge, and can transfer this knowledge to workplace situations, at the appropriate level. Problem-based learning assists the university teacher to bridge the divide between theory and practice.

1.4 Work-integrated student learning

The significance of WIL (or variations of WIL) for students' professional development and employability is widely accepted by both employers (e.g., Confederation of British Industry, 2009) and the higher education sector (e.g., Higher Education Group, 2008). The many advantages for students who engage in WIL include:

- academic benefits, such as improved general academic performance, enhancement of interdisciplinary thinking, increased motivation to learn;
- personal benefits, such as increased communication skills, team work, leadership and co-operation,
- career benefits, for example, career clarification, professional identity, increased employment opportunities and salaries, development of positive work values and ethics; and
- skills development, including increased competence and increased technical knowledge and skills.

WIL does not offer a 'quick fix' solution to national industry's lack of competitiveness; nor can it transform a 'low skills' society into a 'high skills' one overnight. WIL can, however, play a role with regard to the readiness of graduates to enter and contribute to South African society and the world of work. Universities are in the business of offering a broad and critical education: one that enables students to engage with both the world of science and the world of work, especially in the context of social justice, human health, and environmental sustainability. Programmes that include WIL offer opportunities for students to prepare for, and learn from, the workplace, to transfer discipline-based theory and a wide variety of skills learned in their formal education to an authentic context as a colleague and employee, with all the responsibilities and expectations such a role entails.

1.5 Work-integrated learning in South African higher education

The South African higher education system comprises universities (including research-intensive universities), comprehensive universities, and universities of technology. While the higher education system is differentiated in the sense that different institutions offer different types of qualifications at different levels of the HEQF, most South African higher education institutions (be they research-led institutions, comprehensive universities, or universities of technology) have Applied Science, Business, Education, Engineering and/or Health Science faculties, and many of their professional programmes (such as Architecture, Business, Engineering, Law and Medicine) are often the most prestigious and have the highest entrance requirements. Indeed, many universities, across the sector, pride themselves on providing career-focussed education. They have found it necessary and useful to prepare students for the world of work, and to help students to gain practical experience through, for example, work placements or service-learning projects.

WIL, in various forms, has always been a distinguishing feature of professional education, even if it has not been called 'WIL'. In the South African higher education system, professional education has been strongly influenced by professional councils, many of which contribute to curriculum development and the assessment of students in their respective fields. Many of the 'new professions' do not yet have fully-fledged professional councils, but most do have professional associations which guide and support good practice in teaching and learning. While there are distinct knowledge differences between, for example, a two-year diploma and a four-year professional bachelor's degree, WIL, in various forms, has always formed an important part of technical, vocational and professional higher education. The training of health professionals, for example, frequently happens at the site of practice, such as a teaching hospital – and variations of this tradition are reflected in the curricula of courses in the Applied Sciences, Engineering

and Business. The workplace is present in these programmes, both as a learning resource and as a site of knowledge production, and students are often simultaneously acculturated into academic and workplace knowledge systems.

It has been recognised that in order for graduates to integrate successfully into work settings specific kinds of learning are required. In the United Kingdom, for example, the Dearing report (NCIHE, 1997) recommended that all students obtain work-experience associated with their qualifications.

1.5.1 Early understandings and approaches to work-integrated learning

Dewey (1938) was one of the first educational theorists who strongly believed that people learn by doing, and that all genuine education is achieved through experience. Dewey did not only believe in learning by doing; his notion of ‘vocation’ as a calling to a deeply felt and ethically grounded identity within a chosen career encompasses the importance of critical and scholarly engagement with the key issues of public life that link professional and vocational competence. Subsequent theorists, such as Kolb (1984) have similarly pointed out that while ‘experience’ is a part of learning, it is not, on its own, a sufficient condition for learning. Biggs (1999), in the higher education context, claimed that effective learning requires: a knowledge base, a motivational context, learning activities and interaction. For learning to occur, students need to observe and reflect on experience, develop concepts to make sense of the experience and then apply and test out these concepts through new experiences. Donald Schön (1983) points out the importance of reflection and reflective practice in the education of professionals. More recently the theoretical underpinnings of Kolb’s experiential learning cycle and Schön’s ‘reflective practitioner’ model have been challenged. People do not necessarily learn from experience, or from general reflection, particularly if they do not think critically about it or do not take responsibility for its creation. If such learning is seen only as a vehicle to gain information about the workplace and to link technical knowledge with workplace application, then its effectiveness is not fully developed.

1.5.2 Challenges to traditional practices

WIL poses several challenges to traditional universities, universities of technology and comprehensive universities. Programmes offered by traditional universities that do not take into account graduates’ career trajectories need to consider issues of citizenship, graduateness and employability (without succumbing to ‘vocational drift’). Programmes that traditionally include practica, internships, and other forms of workplace experience need to re-consider the alignment of curricular and pedagogic practices. Among the challenges that WIL poses for ex-technikon practices in universities of technology and comprehensive universities, is a new and extended role for what was previously known as ‘cooperative education’. The ex-technikons acknowledged and valued experiential learning, understanding that students develop important knowledge and skills in workplaces. They tended, however, to defer to the practices and requirements of work and industry, often valuing these over academic disciplines. The challenge WIL offers is to develop students’ employability in a broad, rather than a narrow, sense that includes and aligns theoretical learning with practice-based learning. The innovative practices offered by the inclusion of web-based ICTs and social media in WIL offer additional educational and logistic challenges and opportunities to the higher education sector as a whole. It will be also be important for the South African higher education community, in conversation with international peers, to develop curricular, pedagogical and quality management systems that build on the strength of current best and innovative practices, develop areas of weakness, and engage extensively and intensively with curriculum and WIL specialists.

A CONCEPTUAL FRAMEWORK FOR WORK-INTEGRATED LEARNING

In this section, a brief theoretical introduction to WIL is provided. The theory is based on ideas about knowledge domains or fields in professional education, the boundaries between these fields, and ways in which university educators can negotiate these boundaries in ways that benefit student learning.

2.1 Science, higher education and professional practice: three interrelated fields

It is useful to think of a profession as made up of three different fields. The first field, the academic field, provides the scientific basis for the profession. Mechanical Engineering, for example, is based on the scientific disciplines of Physics, Mathematics, Mechanics, and Materials Science. University teachers select and sequence knowledge from the academic field to create a second field, the educational field. To continue the example from Mechanical Engineering, university teachers develop a curriculum, implement various teaching and learning strategies and assessments. When they graduate, students move into the third field, which is one of professional practice (although professional councils may also require the candidate to write their own examination or meet their own criteria in order to enable the candidate to practice as a fully-fledged professional). In professional education, teachers usually also consider the field of professional practice when they develop the educational programme. Achieving a balance between scientific subjects and professionally-oriented subjects can be difficult. Some professional education programmes are largely based on academic disciplines (the natural sciences, the social sciences, business sciences, etc.), while only towards the students' final year of study are aspects of the professional field introduced into the programme.

From this brief description, we can identify three distinct forms of professional knowledge: 1) the academic discipline or field (including current research), 2) the educational field, consisting of curricular, pedagogic and assessment practices, and 3) professional practice. While these three fields have different emphases and areas of focus, all operate within the same knowledge system. Figure 2.1 provides a schematic representation of the knowledge system of the professions:

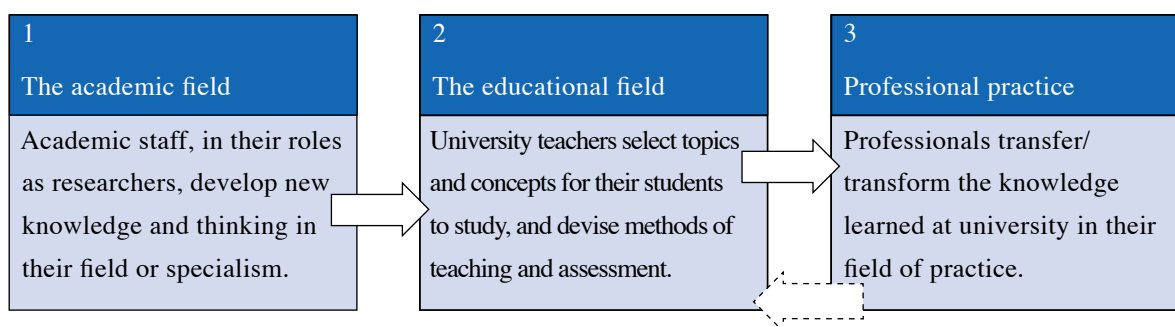


Figure 2.1: A traditional professional knowledge system

In their roles as researchers, university staff members locate themselves in the academic field; in their role as university teachers, they locate themselves in the educational field, while others (particularly in the health sciences where staff are often appointed both as consultants in a teaching hospital and as academics) locate themselves in the professional context. Thus in some cases (most notably the health sciences), university teachers' select what to teach, when to teach it and participate in developing programmes. Other university teachers, while they might have practiced as professionals or have acted as consultants within their professions, have, to a greater or lesser extent, separated themselves from the world of practice. It is therefore more 'natural' for these teachers to make their curricular selections from the academic field, rather than from the field of professional practice. While it is difficult to create linkages across all three worlds of the profession or field of practice, it is to the benefit of students – and to the world of practice – to do so. Programmes that do not provide students with insights into both the academic and the professional dimensions of their chosen field do not adequately prepare students for professional practice.

2.2 Professional education: looking both ways

Michael Barnett (2006), a professor in the Department of Physics at the Imperial College of Science, Technology and Medicine in London, points out that teaching and learning in professional education should be based both on the academic disciplines that form the knowledge base of the profession, and on the world of professional practice, for which candidates should be prepared. University teachers – whose subjects are application-oriented subjects such as Commerce, Engineering, Education, Law, Medicine, Social Work, etc., or who teach subjects such as Physics or Mathematics for Commerce, Engineering, Medicine, etc. – should make their selection of what to teach based on both scientific disciplinary knowledge, as well as knowledge for professional practice.

Building clear linkages between the three fields benefits student learning. It is beneficial for students to engage with the world of science, with an experienced lecturer as a guide; and it is also beneficial for students to engage with the world of professional practice. The WIL approach seeks actively to build linkages between the world of teaching and learning, and the world of professional practice. Figure 2.2 shows how the three worlds can be brought into alignment; the dotted line suggests that there is not a rigid separation between the academic and professional elements of WIL (in the sense that elements of professional practice can be drawn on in constructing a curriculum for academic subjects). The focus of WIL is, however, professionally-oriented education, as shown by the highlighted areas.

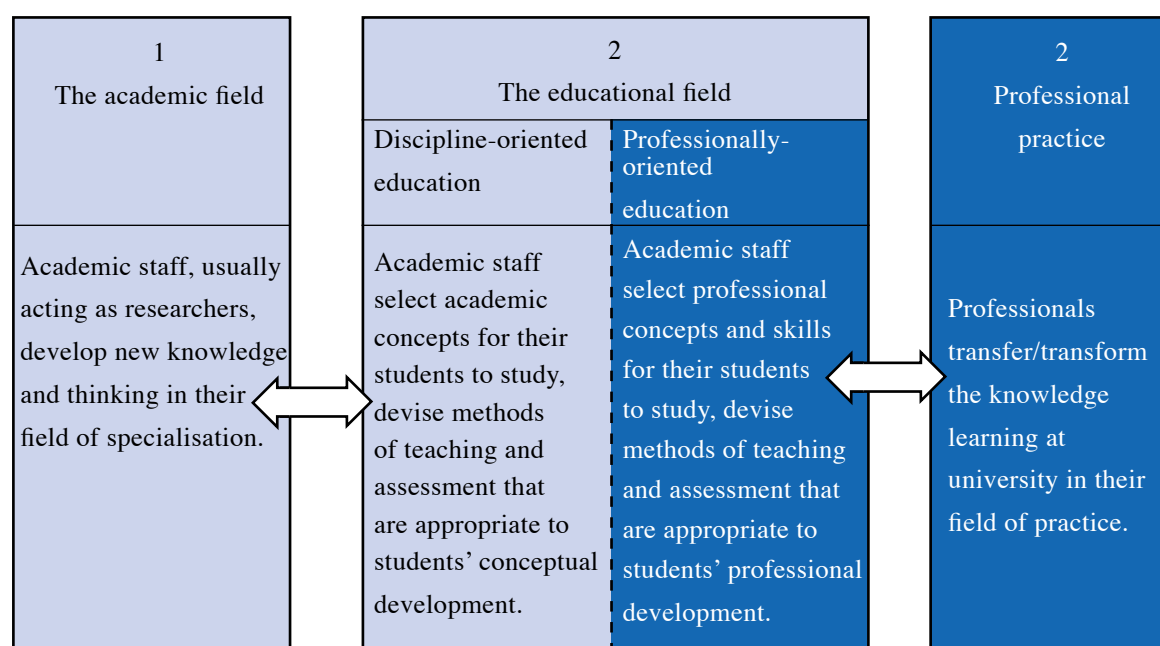


Figure 2.2: A professional knowledge system in a WIL approach

Case study 2 (below) illustrates how the three worlds: the world of science (neuroscience in this instance), the world of student learning, and the world of professional physiotherapy practice can be brought into an alignment that is beneficial to students and to the world of professional practice:

Case study 2: Students, academics and practitioners develop a new therapy for stroke patients

Description: In Finland physiotherapy students are required to do internships in hospitals and, in addition to the regular practice of already learned techniques, they are encouraged to engage in more critical and creative work practices; they are, for example, encouraged to question standard and accepted forms of physiotherapy practice. Students in this case study questioned academic and clinical staff about standard patient rehabilitation procedures, and decided to investigate the treatment of stroke patients, who had lost the use of one side of the body. The students discussed readings and attended a neurology lecture on the use of the ‘mirror method’ with stroke victims. This involved the patients in manipulating objects with the unfrozen half of the body, while observing themselves in a mirror, so that it appeared to the patients as if the paralyzed side was actually functioning. The students felt that this therapy might promote the re-formation of damaged neural pathways in the stroke patient’s brain. The students discussed this methodology with their lecturers, clinical supervisors and the neurologist – and a new method was progressively put into practice. The students in this case study extended and deepened their understanding of physiotherapy and neurology, and the hospital acquired a new, effective therapy for the treatment of stroke patients.

HEQF (equivalent): Level 8, Professional Bachelor’s degree

Resources: Throughout their clinical placement, students were able to consult with academic staff.

Source: Konkola, Terttu Tuomi-Gröhn, Pirjo Lambert & Ludvigsen, 2007.

In case study 2, knowledge areas from the academic field (neuroscience) and from the profession (physiotherapy practice) are equally important in the students’ development, and to the way they are able to contribute to the world of work. Michael Barnett (2006) explains that when two (or more) knowledge forms are brought together, elements of the original knowledge form change and new knowledge is constructed. Basil Bernstein (2000), an educational sociologist, studied this process extensively, and called it ‘recontextualisation’. In this case study, recontextualisation happens in the way that the students bring up-to-date scientific knowledge into traditional practice and contribute to a new therapy for stroke patients.

2.3 Crossing knowledge boundaries

Knowledge building and knowledge transfer are complex actions (and theories of knowledge building and knowledge transfer are equally complex). In this section, we explain some of the difficulties and advantages of crossing knowledge boundaries.

2.3.1 Recontextualising academic knowledge in the world of work

Knowledge learned at the university in a traditional academic lecture does not transfer to practice in the workplace in a straightforward or uncomplicated way. One reason for this is the fundamental difference in the way knowledge is organised in university courses. In academic programmes, knowledge is ‘packaged’ in the form of separate academic subjects. This is in contrast to the many different ways that knowledge

is acquired and drawn on in practice. In practice knowledge is often tacit, and is acquired in a more social way, through team work, mentoring, and so on. Every profession, at every level, will usually contain some basic skills or procedures, such as how to operate an instrument. These basic skills do transfer well to the workplace, but are limited to routine or habitual aspects of practice. When discretionary judgements are required, or when the work involves complex and unpredictable circumstances, then complex forms of knowledge are needed. These complex, scientific forms of knowledge are best acquired in an academic context. Meanings in science operate at a general and context-independent level. If they are learned in a practical context they end up being tied to that context and their transfer capacity is lost. Scientific knowledge should be acquired for what it is; it can then provide the knowledge base for posing and solving problems in the world of professional practice. A difficulty for students is that this knowledge is usually obtained from the study of academic subjects, and students often fail to understand the relevance of disciplinary knowledge, and experience difficulties in transferring what they learned in the lecture hall to the workplace.

2.3.2 Recontextualising workplace knowledge in the academic curriculum

The difficulties described above can partially be addressed by bringing workplace knowledge into academic subjects, but there are a number of complications. Firstly, because much workplace knowledge is not codified, it is difficult to access; and secondly, the nature and structure of university subjects is such that workplace knowledge has to be adapted to the academic context. University teachers who have attempted to bring real projects into the classroom, for example Engineering projects or Medical case studies, will be familiar with these difficulties. University teachers raise questions such as: ‘Is there sufficient mathematics involved in this problem?’ or ‘How can I, as a biochemist, teach a student about physiology?’ On the one hand ‘recontextualisation’ can be seen as advantageous as this process enables university teachers to adapt ‘real life’ problems and case studies to the particular needs of their students and academic programmes; on the other hand, recontextualisation means that the problem or case study is no longer authentic, and may cause confusion to both students and professional partners. The complex relationship between theory and practice is summarised in the quotation below:

The relationship between theory and practice cannot be specified directly because they refer to two different kinds of knowledge. If the relationship is too direct there is a danger that one kind of knowledge becomes the other. In order to make conceptual knowledge easier for students it may become too ‘contextualised’ and lose its context-independent nature. In order to lift the knowledge base of practical knowledge it may become too theoretical and lose its context-dependent nature. A shift in the opposite direction destroys the intrinsic nature of each kind of knowledge (Gamble, 2006:99).

2.3.3 Learning in and across the different knowledge fields

In order to deal with the complexities of recontextualisation, the WIL approach recommends that students experience a range of professional knowledge domains. Students need opportunities to immerse themselves in the academic disciplines that form the basis of their future professions. They need to identify themselves as university students engaged in complex processes of learning. They also need opportunities to learn from the professional domain. As professionals-in-training, they need to be adequately prepared to engage with, and contribute to, the world of professional practice.

Professional programmes require university teachers to make theoretically sound decisions about their programmes and subjects. Questions that should be asked about a programme or subject include the following:

1. What disciplines or academic subjects is the profession is based on?
2. Which subjects are more science-based and which are more profession-based?
3. What elements of professional practice would be appropriate to include in both the science- and profession-based subjects – and why?
4. What are the particular difficulties in bringing elements of practice into the programme?
5. When, and how, would it be appropriate for students to experience the world of practice?

In the next sections we consider the curricular implications for learning in and across professional knowledge fields.

CHAPTER THREE

CURRICULUM DESIGN AND DEVELOPMENT FOR WORK-INTEGRATED LEARNING

3.1 Introduction to curriculum

The term ‘curriculum’ is widely used in an everyday sense to refer to subject matter or ‘syllabus’. Within the field of curriculum studies, the term curriculum includes not only the content of subjects, but how knowledge within a subject is organised, how teachers teach, how learners learn and how the whole is assessed. In this section we focus on the processes of developing curricula to enable a better ‘fit’ between the academic programme and the world of professional practice.

In developing a curriculum the principle of alignment, developed by educationalist John Biggs (1999), ensures that the teaching and learning activities and the assessment tasks directly address the intended outcomes in a way generally not achieved in traditional lectures, tutorial classes and examinations. In an aligned curriculum, students are provided with clear outcomes, teaching and learning activities that are aligned to the outcome and appropriate for the level, and well designed assessments with assessment criteria for guiding and giving feedback to the learner. Curricular alignment in WIL similarly aims to ensure that outcomes, pedagogy and assessments are well matched. Table 3.1 provides a framework for curriculum planning and mapping. It enables the university teacher to see whether the intended course or subject outcomes are appropriate for the level, curriculum modality (see 3.4 below), planned teaching, learning and assessment activities (described as ‘horizontal’ alignment). When such a mapping exercise is done across the levels of the programme it is possible to check whether the main outcomes have been addressed (described as vertical alignment). In this section, we focus on the first three columns of the table, namely the horizontal alignment between outcomes, levels and curricular modality within a subject, module, course or programme.

Table 3.1 Curricular alignment

Intended outcomes (or goals)	HEQF Level	Curriculum modality	Teaching and/or learning activities	Formative assessment task	Summative assessment task
e.g., problem solving	HEQF Level 5	Problem-oriented learning			
Etc.					

3.2 Curriculum development in work-integrated learning

As discussed in the previous chapter, WIL entails the ‘recontextualisation’ of both academic and professional knowledge domains, and the alignment of workplace and academic interests, to the extent that this is possible or desirable. Curriculum development always needs to address multiple interests and needs; it therefore should encompass processes of designing, implementing, evaluating and adjusting programmes

of study in partnerships with academics, workplace representatives, and students. WIL curricula require engagement with:

- the nature and current state of knowledge in the discipline;
- the nature and current state of professional practice;
- philosophies of education, theories of teaching and learning, and educational research findings— particular WIL modality;
- the role and forms of assessment and feedback;
- students’ characteristics and learning needs, interests and abilities;
- the practical, ideological and policy context of the academic department, institution, and higher education system; and
- the practical, ideological and policy context of the profession.

Put differently, a curriculum represents ‘a mix of dimensions and elements embedded in disciplinary developments, state-sponsored debate, the student market and increasing academic-employer discussions’ (Barnett, Parry & Coate, 2001:259). All these considerations should inform a scholarly approach to curriculum development, which in the case of WIL, requires university teachers to engage with disciplinary knowledge, educational knowledge, and professional knowledge.

3.3 Curriculum planning

As in any curriculum, it is important in WIL curricula to ensure the alignment of course outcomes, WIL activities and assessment practices. As a first step, it will be necessary to clarify effective, relevant, meaningful outcomes for the programme or subject. It is particularly important when student learning includes work placement, that the curriculum development team includes academics, professional or workplace representatives and senior students (particularly those with workplace experience). Once the stakeholders have agreed on the learning outcomes, the main learning activities and sites of learning, it will be easier to manage the logistics involved (see Section 6 on Partnerships for WIL and Section 7 on Management of WIL in this regard). Case study 3, ‘Developing an inter-professional patient care curriculum’, provides an example of collaborative WIL curriculum design.

Case study 3: Developing an inter-professional patient care curriculum

Description: The New Generation Project, offered by two universities in the south of England, is an undergraduate health and medical curriculum model developed for an inter-professional education programme for health and social care professions. The project was intended to offer students experiences of professional collaboration, teamwork, and ultimately increase the level of care provided to patients. The curriculum included underpinning learning concepts and models, developed in collaboration by health and social care professionals. This process assisted in the development of teaching and assessment processes considered appropriate to the curriculum model and intended outcomes. In addition, the collaborative approach to curriculum development allowed for the identification of areas where overlap in course content was evident, and opportunities for students across disciplines to come together for these areas of study (e.g., professional communication). A vital stage of curriculum development was the modelling of the inter-professional learning units. This included examination of the units offered, elements within these that required change, and construction of units that linked to professional practice experiences, and exposed students to a variety of learning opportunities. The

resultant learning model encompassed three distinct learning areas: (1) guided discovery learning, (2) collaborative learning, and (3) inter-professional learning. The modes of learning encompassed guided discovery and self-learning, with group processes paramount in the learning activities. Within these group processes, students were required to explore and examine their personal knowledge and experiences of professions within the health and social care sector, and explore the differences between these professions.

HEQF (equivalent): Level 8, part of a professional bachelor's programme.

Resources: Times were scheduled for meetings with university and clinical partners during the planning, implementation, and evaluation phases of the programme. The academic departments provided administrative assistance with the curriculum development process, and provided teaching relief for academic staff during the curriculum development phase.

Source: O'Halloran, Hean, Humphris & Macleod-Clark, 2006.

Successful strategies in the design and implementation of effective WIL curricula ensure that students focus on the integration of theoretical knowledge and practice in ways that allow them to connect university or disciplinary learning with workplace application by:

- designing learning activities that require the integration of disciplinary and workplace-relevant knowledge and skills;
- bringing professional practice to the core of WIL curricula to act as the organiser for both disciplinary (theoretical) and practical learning; while recognising that some workplace practices may be erroneous or out of step with theoretical knowledge and then using this as a catalyst for integrative learning, critique and the development of new knowledge;
- using student placements in authentic professional contexts as learning environments in which students engage in meaningful and consequential workplace activities that are designed to achieve enhanced and integrative learning.

Encouraging students to interpret and reflect on the experience of professional practice and how knowledge is transferred from the academic to workplace context (and vice versa) should be at the heart of learning activities for students in WIL curricula. The following case study illustrates how taking student feedback into account can benefit curriculum development:

Case study 4: Using student feedback to enhance curriculum development

Description: This case study reports on the field placements completed by students as part of the final year of a Bachelor of Arts (Criminology and Criminal Justice) course. Field placements comprised 25% of the final semester workload, and involved students gaining experience in various work environments, within an 'open course framework'. Student learning was structured, with the assistance of university teachers, in a negotiable learning plan, and resulted in a process-based, action-learning curriculum. The curriculum development team consisted of university staff and workplace supervisors. On completion of the project, the team examined students' journal comments and reflections relating to how work experiences prompted their learning, as well as challenges faced within the work environment. The challenges that students experienced were typically related to: 1) immediacy of events, 2) crises, 3) on-going negotiation, 4) reflective processes, 5) mediating meaning between university curricula and work experience, 6) taking responsibility, and 7) collaboration

with others. As a result of considering students' experiences within the work environment, the team restructured the course curriculum to better benefit student learning. The curriculum restructuring recommended strong pre-practice components that were based around specific values that included building knowledge through action, and the inclusion of professional practice and research, in preparing students to be accountable and manage workplace experiences.

HEQF (equivalent): Level 8

Resources: The students were supported by both academic staff and workplace mentors/supervisors; there were regular meetings between academics, workplace mentors/supervisors and the students.

Source: Bates, 2008.

3.4 Curricular modalities

WIL involves curricular, pedagogical, and assessment considerations that differ in certain respects from those of general education programmes. There are many curricular modalities that can be drawn on in developing a WIL programme. The glossary at the end of this guide describes many such curricular variants. In this guide, we focus on four main curricular modalities, with possibilities for many hybrid combinations. These four modalities are: work-directed theoretical learning, problem-based/oriented learning, project-based learning, and workplace learning. Detailed definitions and descriptions of these terms are available in the glossary at the end of this resource. Considerations, in terms of the four basic curricular types, are discussed below.

3.4.1 Work-directed theoretical learning

All WIL programmes will include theoretical subjects or components. These should be aligned with the practical or practice-based components through teaching and learning activities that bring theory and practice together in meaningful ways. The theoretical components of WIL curricula need to take into account the dual nature of professional education, as described in the previous section. This is likely to involve curriculum development that aligns disciplinary demands with workplace relevance, and thereby enhances, rather than compromises, the academic quality of the programme.

Case study 5: Foundation Mathematics for Mechanical Engineering

Description: Foundation Mathematics was conceptualised as part of a fully integrated programme in which a first semester mainstream subject, Engineering Material Science I (EMS I) was supported by academic literacy and numeracy courses, including Mathematics and Science. In the second half of the year, Engineering Manufacturing I replaced EMS I as the core course. This model for Foundational Mathematics was influenced by current research, which challenges 'decontextualised' skills models. Foundation Mathematics could thus be more accurately seen as academic literacy/numeracy for Mechanical Engineering. The Foundation Mathematics course involved contextualised teaching and learning within Mechanical Engineering. The socio-cultural practices within Mechanical Engineering formed context in which the Foundation Mathematics course was presented. The presentation of contextualised Foundation Mathematics involved 1) a forward looking programme, 2) preparation for applied mathematics within Mechanical Engineering, 3) academic literacy, 4) support for other courses at Foundation level, and 5) the integration of language and content.

HEQF (equivalent): Level 5 Foundation Mathematics, part of a Level 7 - 8 qualification.

Resources: Developing the 'contextualised' Foundation Mathematics programme involved the Mathematics lecturer working collaboratively with the EMS and Manufacturing lecturers to develop the 'Foundation Mathematics for Mechanical Engineering' curriculum and teaching and learning materials.

Source: Mahomed, 2007.

Other examples of work-directed theoretical learning (WDTL) include inviting guest lecturers from the workplace or professional practice into the academic classroom; the use of authentic examples or case studies from the world of professional practice in setting learning and assessment tasks, and the inclusion of workplace assessors to form part of a panel to assess students' work.

3.4.2 Problem-based learning

Problem-based learning (PBL) can be used to bring about radical change so that 'problems' rather than academic subjects are the organising structure of the curriculum. The main objective of PBL is the acquisition of an extensive, integrated knowledge base that is readily recalled and applied to the analysis and solution of problems (Boud & Feletti, 1997). There are not many academic programmes in South Africa that have opted for PBL in its purest form. What is more common is problem-oriented learning, which involves the inclusion of real world scenarios for problem-based activities, assignments, projects, and so on. In this guide we draw on the principles of PBL in a blended approach rather than in the 'radical' sense of a fully PBL curriculum. (PBL curricula have been extensively researched and documented). Problem-oriented learning enhances the development of effective and efficient problem-solving skills, self-directed learning skills and team skills.

As with problems in the real world, problems in the curriculum should be 'ill-structured problems' that stimulate learners to generate multiple hypotheses about their cause and possible solution (Heywood, 2006). These ill-structured problems should allow students to observe, interview, review records or documents, etc. in order to obtain information needed to address them. It should be noted that while it is often difficult to achieve, PBL learning is more effective when more than one subject or discipline field is involved and, in principle, information should be integrated from the disciplines that are core to the educational programme and relevant to the problems presented. The processes by which such all encompassing disciplinary knowledge is selectively restructured to address real-world problems are extremely complex. If the problems are not carefully chosen and structured in terms of curriculum outcomes and students' levels, PBL can be ineffective. In addition it is important to take note that problem oriented learning is not appropriate as a method for teaching certain basic skills such as reading or computation; however, it does provide an environment for the transfer of those skills. Critical cross field outcomes (CCFOs) can be developed at different levels and can be tailored to particular areas of work.

Case study 6: Problem-oriented learning in radiography

Description: Rapid technological, social, and contextual changes have required educators to reconceptualise the education of radiographers. The education of radiographers is based on the disciplines of physics, chemistry, radiation physics, anatomy, physiology, pathology and psychology and is located within the applied discipline or specialisation of radiation medicine. Typically the student would learn these discrete disciplines in 'compartments', and then be expected to 'self-integrate' the foundational disciplines of radiography during work placement in a clinical facility. Traditional radiography curricula are therefore not closely aligned with the needs and contexts of

the changing clinical environment and the previous narrow vocational training of radiographers does not meet the educational needs of radiographers in Africa. Boyer's (1990) idea of scholarship as integration is aligned with an emerging vision of radiography as a professional community of technological innovators, academic and clinical educators, practitioners, and students who must practice as members of a multidisciplinary team that includes a wide range of health care professionals who collaboratively strive for a patient-centred approach. The transmission of narrow discipline-based knowledge to students is an outmoded conception of academic work, for 'knowledge is not developed in such a linear manner' (Boyer 1990). A curriculum that encouraged each academic to plan learning activities, including small group work with focussed scenarios to stimulate problem solving, and where the academic/facilitator remained in close contact with the students, thereby enhancing the student to academic relationship and allowing the academic the opportunity to assess student learning properly was considered appropriate. Hence the new university-based radiography curriculum requires educators to be both disciplinary and integrative experts who interpret and facilitate the learning process. In this integrated curriculum, teaching, learning, assessment, research, and work placement all influence each other in a learning environment that is planned to benefit students' learning for competent professional practice.

HEQF Levels: courses from Levels 5-7 in a Level 7 qualification.

Resources: A national consultative process was used to develop qualification outcomes. Curriculum development teams, comprising academic radiography staff and clinical educators, were created to translate national outcomes into a local curriculum that included problem-oriented activities.

Source: Engel-Hills, 2005.

3.4.3 Project-based learning

Project-based learning (PJBL) involves learning through projects. Projects can be 'real' projects located in the world of work. Such projects generally involved elements of research and the supervision by both a university teacher and workplace supervisor or mentor. PJBL can support the acquisition of an extensive, integrated knowledge base that students can draw on and apply to the analysis and solution of problems. More often the problems in PBL are simulated and the learning takes place in the university (with some input from workplaces). In work-integrated PJBL the projects are generally not simulated, but involve learning through practice in a work context, as in service-learning or in a university-industry collaborative research project. Projects, like problems, are a means of engaging students in complex, work-related issues, through which they develop and transfer skills and knowledge. PJBL is thus a strategy that recognises both students' inherent drive to learn and capacity to do useful work (Turner, Keegan & Crawford, 2000). Projects do not always lend themselves to 'coverage' of all outcomes in a curriculum. This means selecting those topics that reflect the most important ideas and concepts in the curriculum and incorporating those topics into projects. It can also mean identifying what is achieved through the PJBL activity and filling the gaps through other teaching and learning activities to achieve curriculum alignment.

Case study 7: Project-based learning in undergraduate Mechanical Engineering

Description: At Stevens Institute of Technology the undergraduate Engineering curriculum has undergone significant revisions to enhance traditional lecture-based courses with both a design spine and a laboratory component connecting the entire educational programme. PJBL is integrated throughout the curriculum. An initial implementation of PJBL and its preliminary assessment in

a first year course in Mechanics of Solids and a second year course in Mechanisms and Machine Dynamics was evaluated. The benefits of PJBL included enhanced student participation in the learning process (active learning and self-learning), enhanced communication skills, addressing of a wider set of learning styles, and promotion of critical and proactive thinking. PJBL also facilitated the development of many of the 'soft skills' demanded from Engineering graduates, as described by the United States Engineering Council. Examples included: effective teaming skills, project management, communications, ethics, Engineering Economics, etc.

HEQF (equivalent): Levels 5-6

Resources: There was collaboration and consultation with workplaces in the identification of suitable projects, as well as in the planning, implementation and assessment of the student projects.

Source: Hadim & Esche, 2002.

3.4.4 Workplace learning

Workplace learning (WPL) takes place when students are placed in work environments for the purposes of learning. Learning in the workplace therefore usually involves students in planning and implementing an activity, in reflection on and evaluating the activity, and making adjustments for future action. The student uses this reflective process to determine what was useful or important to remember, and uses this learning to perform another activity. In this sense, workplace learning mirrors the way humans naturally learn. WPL curricula tend to be based on Kolb's (1984) learning cycle, or versions thereof. The learning cycle proposes an iterative series of processes which underlies learning. There are four stages:

- Concrete experience: one cannot learn something simply by watching or reading about it; active involvement is necessary.
- Reflective observation: student attention should be focused on particular elements of the experience. This means taking time out of doing and pausing to consider what has just taken place.
- Abstract conceptualisation: through a process of inductive reasoning, the students analyse observations, explain them, and integrate them into logically sound theories.
- Active experimentation: the students consider how they are going to put what they have learnt into practice (Gosling & Moon, 2001)

Learning becomes less efficient where one or more of the learning cycle stages are missing, or where a student lacks the skills or opportunity to deal with one of them.

Case study 8: Professional development in the Hogeschool Enschede

Description: In general in the Dutch polytechnics there is a focus on a professional development programme that is facilitated by university teachers who are able to make connections between the study programme and work practice in the professional field. The Hogeschool Enschede has established what is called a 'study house', in which the focus is on 'productive knowledge and skills rather than reproductive knowledge'. Not all subjects are taught through the study house, for example, the more technical subjects such as Science and Engineering, but even in these subject areas there is a tendency to limit content and promote work-related skills development. This could be seen as a radical form of WPL in which learners use the institution as a resource to meet a set of pre-determined work-related competencies. These competencies are a mix of generic abilities such as problem solving

and information gathering and more specific competencies related to businesses in the regions around the university. There may be different sub competencies which relate to different business fields, such as manufacturing and retail. So, for example, problem solving would be broken down into five or six more specific competencies derived from research into the sorts of problems that typify work in that region and that sub-field. The competencies are adjusted for each year, becoming increasingly complex. It is the task of the university teacher and work-based students to develop the curriculum, including assessment tasks that demonstrate that students have achieved the competencies. Students would typically not be at one workplace but would move around seeking to help workplaces with problems they encounter. One of the ways they do this is to approach businesses and ask how they may help – in this sense the problem is real and its successful resolution would enhance the business and the students' learning. An example of how this was done relates to a football club's souvenir shop. The student, a club supporter, offered his services and was asked if he could improve stock lists and payment records. He did this by designing and implementing a bar-code system. Generally, the students move between an IT room/library in the institution and the businesses of their choice. They are required to report on their progress to their teacher at the institution. Discussion between the student and tutor would centre on the evidence of work done against the competencies, which the student is required to demonstrate. Knowledge, and how it is to be assessed, which serves as evidence of having achieved the competencies, is negotiated between the student and the academic tutor. Students may decide that they need certain areas of knowledge or skill over and above those that they are learning in the workplace. When this arises, students can ask for a short course on their desired topic and this is developed by university teachers. Once suitable professional subject matter has been identified, an appropriate curriculum and teaching and assessment strategy can be developed.

HEQF (equivalent): Levels 5–7 courses in Levels 7-8 qualifications.

Resources: Students work with tutors on the design of tasks specific to their workplace. Students also have to work with their tutor on the credit value of the tasks and competencies so that they can be assessed each year.

Source: Garraway, 2007.

Sites of practice in the Health Sciences (state and private hospitals and clinics) and teacher education (public and private schools) have the appropriate structures in place for the induction, mentoring, supervision and assessment of student practitioners. WPL has long been accepted in traditional universities (as well as in universities of technology and comprehensive universities) in programmes such as nursing, medicine and teacher education – and a range of practices for their supervision and assessment have been developed (e.g., clinical assessment, the teaching practicum). In cases where there is no, or little, infrastructure to accommodate WPL, these structures have to be created, and it is the role of the higher education institution to ensure that there is support for WPL.

Difficulties arise in contexts where the site of practice does not have appropriate structures and systems to support student learning. The lack of structural support for learning and assessment has caused many well-intentioned WPL interventions to fail. In traditional universities, the Engineering disciplines have tended to separate theory and practice. The university offers theoretical Engineering and an academic qualification, while the Engineering Councils accredit engineers as professionals. There are several reasons for this. One reason is that, unlike hospitals and schools, there are no specific teaching-oriented engineering workplaces. In commercial and industrial contexts there are few structures or resources in place to support student learning, or to supervise and assess student practitioners. Where such structures are lacking, WPL

is not always appropriate in an undergraduate programme because learning conditions are too varied (i.e., dependent on the individual workplaces) resulting in potentially good learning in some contexts and very poor learning in others. In the case of Engineering, PBL and PJBL have generally been more effective than WPL (Savin-Badin & Major, 2004). (It should be pointed out that both PBL and PJBL could include a limited, structured, WPL component.)

Another reason why WPL has not always served the purpose that it was originally designed to meet, has to do with the changing nature of workplaces. Many employers require entry-level employees with high-level technical skills, and this makes a first or second year student ‘apprentice’ not particularly useful to a modern technology-based workplace; nor does it provide the student with appropriate learning experiences. The universities of technology are thus seeing a decline in the cooperative education system for the same reasons that the apprentice system has declined in the rest of the world (Young 1998). An additional reason has to do with differences between theoretical academic knowledge and contextualised workplace knowledge – and the difficulties of creating meaningful articulation between them – particularly when the difference between the knowledge forms and structures are poorly understood by both educators and workplaces.

It needs to be acknowledged that effective WPL is unlikely to happen without strong theoretical learning. Students will need a solid grounding in the disciplines associated with their programmes of study in order to gain full competence in their professions. Students should also understand how the knowledge production systems of the disciplines are relevant to extra-academic contexts, if they are to prepare themselves adequately for South Africa’s diverse social and economic needs. Effective WPL should be included in discipline based knowledge, and should endeavour to understand appropriate disciplinarity. If this is not the case, polarity is likely to occur and an ‘antidisciplinary’ attitude taken in which vital discipline-based concepts are ignored or trivialised, rather than enlarged through linkages among disciplines and across contexts.

3.5 A work-integrated learning typology

From the case studies above, we can identify four distinct WIL curricular modalities that can be used to inform curriculum design, understanding that there are additional modalities (see glossary) and that many hybrid forms can also be used. Table 3.2 (below) provides an overview of the most common types of WIL curricular practice:

Table: 3.2: A work-integrated learning typology

Curricular modality	WDTL	PBL	PJBL	WPL
Terms and practices associated with the curricular modality	Classroom-based instruction, Lecture, Tutorial, Peer learning groups	Sequenced real world problems, Integrated learning, Discovery learning, Self-directed learning, Peer learning groups	Industry project, ‘Real world’ learning, Guided practice, ‘Capstone’ modules	‘In-service’ Work placements, Cooperative education, Practicum Work-based learning, ‘Sandwich’ courses, Apprenticeships, Internships, Traineeships

Examples	Career-focused courses and curricula (e.g., Maths for Engineering, Communication for Business), Guest lecturers (e.g., from industry), Authentic examples, Workplace assessors	Work simulated problems, Case studies and scenarios, Team learning	Study visit, Site visit, Job shadowing, Authentic tasks & texts, Fieldwork, Interviews, Team work, Service Learning, Integrated trans- or inter-disciplinary projects	Learning contracts, Work record books, Learning logs, Journals, Mentoring, Specific training, Learning portfolios
Sites of learning	Lecture theatre, Classroom, Laboratory, Studio, Websites Blogs	Classroom, Laboratory, Group sessions, Library, Electronic media	Multiple sites: Classroom & Workplace, Laboratory & workplace, etc Electronic media	Workplace & Classroom (for preparation & reflection) Electronic media

3.6 Implications for work-integrated learning at different HEQF levels

In writing the specifications for new qualifications and designing the learning programmes leading to these, curriculum developers need to consider carefully the nature of WIL in relation to the entrance requirements, the exit and cross-field outcomes and the graduate attributes associated with a particular curriculum for a particular profession or workplace. Curriculum developers will need to interpret the descriptors for each qualification on the HEQF and design qualifications and programmes that are in alignment with these. Figure 3.1 provides a schematic overview of the main features of the HEQF:

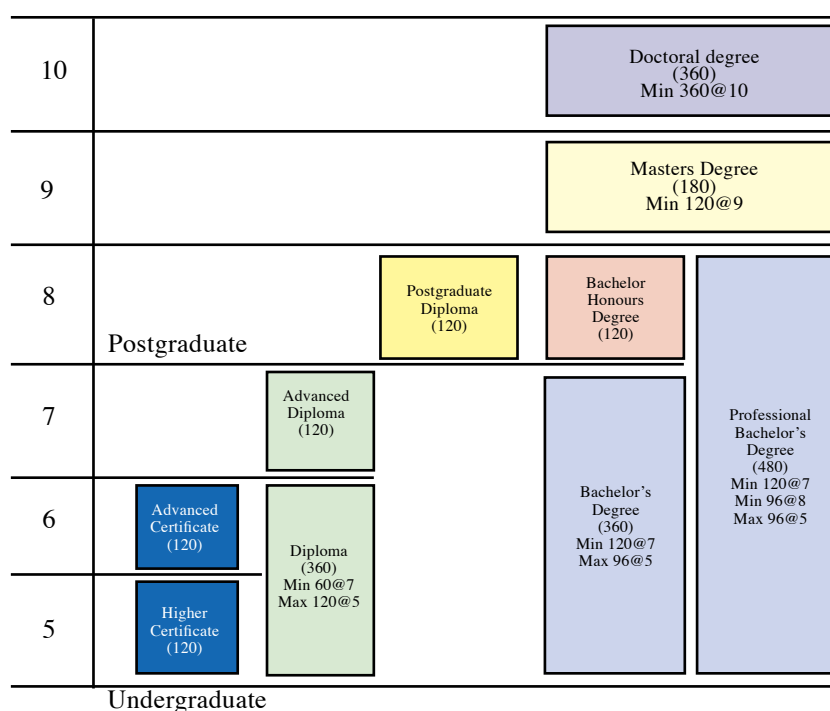


Figure 3.1: A schematic presentation of the HEQF

3.6.1 Work-integrated learning in a one-year certificate (HEQF Level 5)

Examples of a one-year certificate programme are the National Certificate: Dental Assisting and the National Certificate: Clothing Management. The purpose of these qualifications is to supply the workplace with competent practitioners who are able to perform assistive or supportive roles.

Work-directed theoretical learning

Because of the short duration of this type of qualification WDTL would be the main recommended curricular modality, with an additional focus on practical and generic skills related to employability or the potential for self-employment. A qualification at this level should include consultation with workplaces for planning, implementation and assessment to ensure that the curriculum, as well as teaching, learning and assessment practices, materials, texts, simulated scenarios, etc., are appropriate for the qualification.

Problem-based learning

Strongly guided and clearly structured problems would enhance student learning. There would need to be collaboration between academics and workplace representatives to ensure that the problems chosen have both academic relevance and workplace authenticity.

Project-based learning

As the literature recommends that PJBL components be approximately one semester in duration, this curricular model would not be recommended.

Workplace learning

In view of the short amount of time for a one-year qualification, it would probably not be appropriate to include a significant WPL component in such qualifications. If it is felt to be necessary to include short term WPL, the necessary supporting infrastructure for workplace experience or mentoring should be in place.

3.6.2 Work-integrated learning in a two-year advanced certificate (HEQF Level 6)

Examples of two-year advanced certificate programmes include the Advanced Certificate in Accountancy and in Financial Information Systems. These qualifications aim to equip students with the knowledge, analytical skills and discipline to operate effectively at entry level of the professions. The Advanced Certificate in Education (ACE) provides for training in a new area of study such as a subject specialisation and enables educators to update, enrich and or supplement their existing knowledge and competence in an area of study. Radiography has submitted a 2-year level 6 qualification in Diagnostic Radiography to meet the call for a 'mid-level' professional. The purpose of the qualification is to develop a learner competent in applying theoretical knowledge, practical experience and skills in limited radiographic procedures.

Work-directed theoretical learning

It is likely that most two-year qualifications will include WDTL in which students participate in classroom based teaching and learning that is aligned to the requirements of the particular qualification.

Problem-based learning

Learning through real world problems would be appropriate in the first and/or second year of the programme; either for the full year or a part of the second year.

Project-based learning

In a two-year programme, there are likely to be time constraints on PJBL, as well as the complexity of the project, thus this curricular form is therefore not generally recommended – with exceptions for short, focused projects – or a PBL/PJBL hybrid.

Workplace learning

As for 3.6.1 above.

3.6.3 Work-integrated learning in a three-year diploma/Bachelor's degree (HEQF Level 7)

Examples of three-year diplomas include a wide range of diplomas offered by universities of technology (e.g., in Accounting, Building, and Clothing Management). These qualifications equip students to conduct research, analyse and implement systems and policies, and combine a wide range of technological knowledge, skills and experience within a specialised area of the technology. Traditionally, universities offer general, rather than WIL three year qualifications, such as the B.A. or B.Sc (although there are some three-year career-focused qualifications in which WIL would be appropriate).

Work-directed theoretical learning

Technical and professional knowledge at this level is based on disciplinary knowledge (e.g., Physics and Mathematics in Engineering; Business Economics and Communication in Project Management). A WDTL curriculum would need to ensure that disciplinary knowledge is aligned with the needs of professional practice.

Problem-based learning

PBL is particularly appropriate in a career-focused diplomas and Bachelor's degrees.

Project-based learning

A focused project, such as a service learning project, would be appropriate at the third year level, provided that there are adequate resources for such a project – in particular a transport budget, time allocation, and formal agreements with community partners and service providers.

Workplace learning

Where it is felt that students would benefit from work placement in a three-year qualification, the necessary resources would need to be made available. This would include the selection of workplaces (based on the learning opportunities and infrastructure provided), the provision of workplace mentors, opportunities for 'debriefing' and reflecting on learning, etc.

3.6.4 Work-integrated learning in a four-year professional Bachelor's degree (HEQF Level 8)

Career-focused professional Bachelor's degrees include qualifications in Engineering, Medicine, Radiography and Nursing offered at both universities of technology, comprehensive universities and traditional universities. Such degrees usually have 480 credits.

Work-directed theoretical learning

As for 3.6.3 above.

Problem-based learning

As for 3.6.3 above.

Project-based learning

Where there are adequate resources to support PJBL – such as transport budgets, formal agreements with workplaces, the provision of mentors/coaches – PJBL can contribute significantly to student learning. PJBL is recommended in the third and fourth year of a four-year professional qualification when the students are more able to learn from complex situations, have near-professional level skills, and are thus able to contribute to problem solving or innovation in a workplace in a meaningful way.

Workplace learning

As for 3.6.3 above.

3.6.5 Work-integrated learning in a Master's degree (HEQF Level 9)

Many Master's degrees in the applied disciplines (Engineering, Health Science, Business, etc.) are work-integrated in the sense that they address problems, develop and evaluate innovations, or investigate practices in the world of work.

Work-directed theoretical learning

This curricular approach would be appropriate for the course work component of a Master's degree in an applied discipline or career focused programme. In a research-only masters it would be appropriate to offer support through, for example, a WDTL seminar programme.

Problem-based learning

Where a research project addresses a hypothetical or real world problem or undertakes an authentic task, the solution should involve more than a synthesis of previously learned knowledge. The supervisor/institution should ensure that the problem can provide data that are repeatable, can provide candidates with opportunities to evaluate and reflect their own understanding, and that the supervisor can report on student progress.

Project-based learning

Many Master's theses in the applied disciplines take the form of PJBL, e.g., in R&D-type research in which an intervention or product is designed, implemented, studied, and evaluated.

Workplace learning

Where a workplace problem is the focus of the Master's thesis, and most of the work is done in the workplace, and the workplace provides the resources for such work, then it is recommended that a workplace supervisor (with a minimum of a Master's level qualification in a related discipline or field) should be appointed to guide the candidate's research. There would need to be strong collaboration between the university-based and the workplace-based supervisors, including regular meetings, progress reports, and so on.

3.6.6 Work-integrated learning in a Doctoral degree (HEQF Level 10)

Many Doctoral degrees in the applied disciplines (Engineering, Health Science, Business, etc.) are work-integrated in the sense that they develop knowledge that is relevant to the world of work.

Work-directed theoretical learning

WDTL is commonly used in ‘professional doctorates’ (Boud & Tennant, 2006). Such degrees are currently not widely offered in South Africa, although doctoral support/supervision can be viewed as a form of WDTL in cases where the thesis topic is relevant to work or professional concerns.

Problem-based learning

As for 3.6.5 above.

Project-based learning

As for 3.6.5 above, with particular emphasis on the contribution to knowledge.

Workplace learning

As for 3.6.5 above – with the additional recommendation that the workplace supervisor has a doctoral level qualification in the discipline or field.

Table 3.1 summarises recommendations for the four WIL curricular modalities at the different levels of the HEQF:

Table 3.3 Work-integrated learning modalities and HEQF levels

	Work-directed theoretical learning	Problem-based learning	Project-based learning	Workplace learning
Certificate	✓	✓ (short, focussed)	✗	✗ (time too short)
Advanced Certificate	✓	✓	✓ (short, focussed combined with PBL)	✗ (time usually too short)
Diploma	✓	✓	✓	✓ (short placements)
Bachelor	✓	✓	✓	✓ (short placements)
Advanced Diploma	✓	✓	✓	✓ (short placements)
Postgraduate Diploma	✓	✓	✓	✓ (short placements)
Professional Bachelor	✓	✓	✓	✓ (combined with PJBL)
Master's	✓	✓	✓	✓ (combined with PJBL)
Doctorate	✓	✓	✓	✓ (combined with PJBL)

3.7 The formal accreditation of work-integrated learning

With regard to WDTL and problem-oriented learning, there are generally no special requirements needed for formal accreditation, as these curricular modalities are easily integrated into standard subject formats and their associated accreditation and subsidy systems. In the case of a full PBL curriculum, PJBL and WPL special consideration is necessary.

3.7.1 Accreditation of work-directed theoretical learning

As this curricular modality is integrated within an academic subject, no special requirements are necessary, although additional funding with regard to collaboration with professional or workplace partners will be needed.

3.7.2 Accreditation of problem-based learning

In the case of a full PBL curriculum, a number of resources are necessary. While the subject may still be registered as a subject, and receive its full credits and subsidies, additional funding will be necessary to accommodate the additional requirements – such as additional support and tutoring staff, work space in laboratories or project rooms, additional library resources, and materials. In the case of problem-oriented learning, particularly when the problems, scenarios, or case-studies are text-based (rather than practical) no significant additional resources are required.

3.7.3 Accreditation of project-based learning

PJBL is normally introduced at higher levels of the HEQF, and is sometimes constructed as a separate subject:

Table 3.4: Examples of PJBL as subjects

Examples of PJBL subjects	Credit value	HEQF Level	Subsidy
Mechanical Engineering Project III	20	7	Equivalent to subject
Software Engineering Project IV	30	8	Equivalent to subject
Design Project IV	30	8	Equivalent to subject

Sometimes the project, such as a service learning project, is integrated within a subject – or across a number of different subjects – and does not appear as a separate subject. Projects usually demand a number of resources, depending on their complexity and the extent to which students need to be transported to workplace or community sites. For these reasons, it is often advisable, in the case of significant student projects, to develop these as separate subjects, with dedicated credit values and subsidies.

3.7.4 Workplace learning

In many professional programmes, WPL is required, although not necessarily awarded full subject status. In most credit systems internationally, the award of credit points for academic subjects is linked to expected hours of study. It is difficult to link workplace activities with formal study time formally because learning in a workplace is different from learning in a classroom or from texts. In most WPL programmes the level of support required for student learning is variable: most students will need support with finding appropriate placements, negotiating their activities with workplace supervisors, implementing activities, dealing with difficulties encountered in the workplace, and producing the evidence necessary for the assessment of WPL. Typically, students in professional programmes acquire the ‘soft skills’ associated with their profession in WPL, rather than the scientific knowledge that is best learned in academic settings. For these reasons, workplace learning is typically given either no credit points (even when it is a compulsory component of the course, as in case study 9 below), or it is given a low credit value (as in case study 10 below):

Case study 9: Practical experience in the Electrical Engineering curriculum at UCT

Description: Prior to registration for third year academic subjects, Electrical Engineering students are required to produce, to the satisfaction of the head of department, evidence of completion of suitable basic-level work during a period of at least six weeks in an approved workshop. This practical experience is given a course name and code: Practical Training EEE300X. Many students chose to do EEE300X in the long vacation, after their second year. The evidence must be produced by 31 March of the year following the work experience. For the fourth year Practical Training EEE4100X programme, EEE300X is a prerequisite. Electrical Engineering students are required to produce a report, to the satisfaction of the head of department, showing completion of suitable work for a minimum of three weeks experience in an Electrical Engineering environment. The experience must include instruction, practical work, engineering work analysis, design, and site inspection. The students are required to submit their reports before they graduate. There is no credit value for either of the Practical Training courses, and no subsidy for them, although both are required for admission into the third year (in the case of EEE300X) and for graduation (in the case of EEE4100X).

HEQF Levels: 7 and 8

Resources: Students are expected to find their own workplace sites, but these must be approved by the programme coordinator.

Source: University of Cape Town, 2011.

Case study 10: Accrediting Public Relations internships

Description: Work-integrated learning is a major focus for third year Public Relations students at the University of Canberra. The work integrated learning experience is formalised through a course called ‘Communication Internship’, a compulsory six credit point unit convened by departmental academic staff. The unit spans two semesters and combines 150 hours of work experience with assessment and reflective practice. Students find their own internship places using a database available on the PR internship website. During the internship students receive feedback on their performance through an internship report, seminar activities, oral presentations and their personal portfolio. As a former intern observed, ‘I do not understand how students enter the workforce without the experience. Beyond valuable’.

HEQF (equivalent): Level 7

Resources: A up-to-date database of potential workplaces is provided by the university, students are supported throughout the work experience.

Source: University of Canberra, 2010a.

State subsidies are linked to the credit value and CESM category of subjects, and although most WPL programmes have low or no credit ratings, they are extremely demanding in terms of resources, particularly the time that university teachers need to devote to planning the WPL, negotiating with workplace supervisors, making site visits, providing on-going support, and so on. For this reason it is essential for WPL to be well-funded, if they are to be sustainable.

3.8 Recognition of prior learning in a WIL curriculum

The recognition of prior learning (RPL) is ‘a process whereby people’s prior learning can be formally recognised in terms of registered qualifications ... regardless of where and how the learning was attained. RPL acknowledges that people never stop learning whether it takes place formally at an educational institution or whether it happens informally’ (SAQA, 2005:1). Many institutions have policies on RPL for admission to, and advanced standing within, a qualification. The process of RPL can be summarised as: 1) identifying what the person knows; 2) matching the person’s knowledge, skills and experience to outcomes and associated assessment criteria; 3) assessing the candidate’s knowledge against outcomes; and 4) crediting the person for skills, knowledge and experience acquired in the past. In most RPL cases, candidates need to be carefully assessed to ensure that they are appropriately placed within a programme. Case study 11 below, takes a somewhat different approach, in that a qualification was designed around what people in a workplace had learned through experience.

Case study 11: Formal accreditation of workplace learning

Description: Universities have, on occasion, been involved in designing specific programmes for the needs of a particular industry or workplace. Such programmes are typical of extra-mural departments, adult learning centres, continuing education programmes, etc. There is a growing tendency for such programmes to become formalised and accredited within mainstream programmes – such as the University of Cape Town’s Trade Union Educator’s Diploma (DITSELA) programme. This programme is offered at a site of work (e.g., a manufacturing company) and involves weekly meetings at the university and the implementation of activities and projects at the workplace.

HEQF: DITSELA is offered at Level 7 – and offers the option for successful students to progress into a formal teaching qualification at Level 8; depending on their academic results, some students are accepted onto an M Phil (Adult Education) (Level 9).

Resources: The workplace pays the candidates’ fees, provides meeting spaces at the workplace, and enables the interventions that are part of the learning programme to be implemented and monitored. This involves close collaboration between the university teachers and the HR or training managers.

Source: Winberg, 2006a.

WIL curriculum development offers many challenges, but offers many benefits for student learning and development. In deciding what kind of curriculum is appropriate, university teachers should ask the following questions:

1. How does WIL fit with the overall programme objectives/outcomes?
2. How does WIL contribute to the achievement of the programme’s objectives/outcomes?
3. Which WIL modality lends itself to the particular programme? Why?
4. What sort of WIL opportunities can the institution realistically provide?
5. What sort of WIL opportunities can related industries or professional practices provide?
6. What sort of capacity development might the academic staff need (e.g., visits to industry; Industry placements)?

7. What is an appropriate HEQF level for the WIL component?
8. Should the programme be formally accredited, or be required for Duly Performed (DP) purposes?
9. What resources are needed? (e.g., for fieldwork, site visits, etc) – and how should the WIL component be funded?
10. Who are the people involved in higher education/workplace settings? (e.g., is it relatively unusual for people within a profession to only work with other members of the profession in multidisciplinary teams?)

In the next section, teaching and learning activities that are aligned with different curriculum modalities are suggested.

CHAPTER FOUR

TEACHING AND LEARNING WORK-INTEGRATED LEARNING

This section examines teaching and learning activities associated with the WIL curricular strategies described in the previous section. It is important that the teaching and learning approaches are aligned with the course outcomes, the relevant HEQF level and the curricular form.

Table 4.1 Teaching and Learning in the WIL curriculum

Course outcomes (or goals)	HEQF Level	Curriculum modality	Teaching and/or learning activities	Formative assessment task	Summative assessment task
e.g., problem solving	HEQF Level 5	Problem-oriented learning	The lecturer presents case studies; students work in groups to answer questions related to the case study		
Etc.					

4.1 Teaching for transfer

A central concern for teaching in WIL contexts is how to teach for transfer. The knowledge that students acquire in academic classrooms will need to be applied within professional settings, be relevant for solving problems encountered in workplaces, promote interaction and collaboration between colleagues and team members, and develop individual accountability, including self-assessment abilities. Learning activities prior to graduation or work placement needs to assist students in the development of skills required for professional practice at work. Developing pedagogies that are appropriate for a particular programme requires:

- engagement with the scholarly work of others, including general, discipline- specific, and professional pedagogic literature;
- reflection on one's own teaching practice and student learning in the subject or programme;
- communication of aspects of this practice and theoretical ideas about teaching and learning; and
- consideration of one's own conceptions of teaching and learning (Trigwell et al., 2000: 163).

The implementation of WIL strategies to develop graduateness (e.g., metacognition, skills, practices) involves more than subject knowledge. WIL approaches to teaching involve the transfer of tacit and explicit knowledge; that is, knowledge of the workplace setting and associated system structures that students are working towards being employed within, in addition to theoretical subject knowledge. The contextual nature of the workplace is highlighted as being as important as theoretical knowledge. To address these factors and increase curriculum quality, the WIL teacher should begin with an examination of curriculum outcomes and how these have (or have not been taught), the observed barriers within the university system, and the ways in which what has not been taught and the identified barriers can be addressed through integrative collaborative practices within the university (Knight & Yorke, 2004).

4.2 Student learning in work-integrated learning

In most professional programmes, students have to master sets of basic level skills, such as taking a patient's blood pressure in health contexts, or using a range of hand and machine tools in Mechanical Engineering. In some cases, it is appropriate to use the workplace as a site in which these basic skills can be practiced, such as in the Health Sciences. When there is considerable effort to place students in workplaces, it is inappropriate for them to make use of the workplace to practice basic skills. These basic skills, for example, proficiency in the use of various tools, are best practiced in a dedicated university laboratory or workshop that complies with the necessary health and safety regulations. The workplace is a place where students can learn from experts, not where they go to practice basic-level skills (with some notable exceptions). The workplace is also where students bring new knowledge, which should be at the 'cutting edge' of their discipline. WIL is in this sense mutually beneficial to students and workplaces: that the students bring new knowledge, insights and fresh ideas, while the workplace provides opportunities for students to observe experts in their field, and to work under their supervision.

4.3 Academic and workplace collaboration in teaching and learning

There are a number of ways in which teaching and learning in WIL can benefit from collaborative partnerships with professionals and workplaces. The section on 'Partnerships' (section 6 below) provides a number of case studies on collaboration in teaching and learning.

4.4 Pedagogical approaches for different WIL curricular modalities

In this section, we look more closely at the alignment of teaching and learning activities within the four main curricular modalities described in the last section, namely: 1) work-directed theoretical learning, 2) problem-based learning (in a broad, rather than specific sense), 3) project-based learning, and 4) workplace learning.

4.4.1 *Work-directed theoretical learning*

In WDTL the acquisition of discipline-based content knowledge should include active forms of learning, such as group learning, demonstrations, tutorials, practicals, and experiential (in the sense of 'hands-on') learning opportunities (Brockbank & McGill, 1998). Formal lectures (which could include guest lectures by workplace representatives) are not excluded, but should be balanced with more active forms of learning. Case study 12 below shows how theory-based learning in a history of architecture class (described as 'vertical knowledge' in the case study) was aligned with professional practice (described as 'horizontal knowledge') through site visits and classroom 'debriefings' following the site visits.

Case study 12: Work-directed theoretical learning in architecture

Description: Teaching and learning in a history of architecture programme was studied, with a view to finding ways of aligning the theoretical historical component with professional practice. Architecture, like most of the professions, requires not only a vertical knowledge base (in structural physics, aesthetics, and design), but also the ability to draw on these disciplinary reservoirs in building new knowledge to address particular structural and design problems in particular contexts. The education of architects should expand on students' vertical knowledge bases, but should also create opportunities to enable the 'circulation' of vertical knowledge and horizontal knowledge to better prepare students for the professional repertoire in which there will be a constant need for such circulation.

HEQF (equivalent): Level 5 History of Architecture course, part of a Level 7 qualification.

Resources: Professional architects spend much time visiting sites, assessing the feasibility of a project, inspecting building work, or managing the construction process. They will also spend time researching old records and drawings, testing new ideas and construction techniques. It was recommended that some of these be simulated in this history curriculum. One way to achieve this, might consist not only of learning text-based knowledge about buildings (whether historical or contemporary) but learning to draw on reservoirs of disciplinary knowledge (structural, aesthetic and design) in the application of these to specific problems. Architects in practice work closely with other members of the construction industry, including engineers, builders, surveyors, heritage (and other) consultants, and local authorities, and this too might be an area for productive WIL. It was recommended that architectural students engaging with Structural Engineering students around design problems, might be another way of accomplishing the circulation of vertical and horizontal knowledge.

Source: Winberg, 2006b.

Group learning and autonomous learning should be promoted in work-directed theoretical learning (e.g., through research projects, reading assignments, seminars) in order to align theoretical learning with workplace demands (Bennett, Dunne & Carre, 2000). Expectations similar to those of related workplaces (e.g., attendance, deadlines, levels of formality) should be placed on students (Saunders & Machell, 2000) to the extent that this is feasible. Case study 13 illustrates how 'ground rules' in the classroom are aligned with student learning:

Case study 13: Ground rules in the Constitutional Law II class

Description: The professors and students negotiate ground rules for the class which exemplify the spirit of the United States constitution with regard to respecting the rights of others, non-discrimination, etc. Penalties are also negotiated, such as up to half of all marks being taken off students' final results if there are more than five unexplained absences. In this way the climate of student learning simulates the professional work place.

HEQF (equivalent): Level 6 programme within a Level 8 qualification.

Resources: Time is scheduled for the negotiation of the ground rules.

Source: University of Miami, School of Law, 2008.

4.4.2 Problem-based learning

PBL is an active form of learning. In a 'pure' PBL approach, carefully sequenced problems direct students

in an active learning cycle. Facilitators do not direct what students should learn, or what resources they should use. Interdisciplinary teams design and provide the problem simulations and problem experiences that challenge the students to achieve curricular outcomes. Facilitators guide students in their work with the problem as they develop problem-solving skills, identify what they need to learn and develop self-directed learning skills. In problem-oriented learning some of these methods are used to provide opportunities for active and engaged student learning. PBL is considered by some as ineffective when it is episodic, added on to, or mixed in, with more traditional, didactic, teacher-directed, passive, memorisation- and lecture-based educational methods (Heywood, 2006). However modifications of PBL have been successfully incorporated into more learning-centred WIL curricula. Problem-oriented learning requires that students are active learners, responsible for their own learning, and that they have adequate time for self-directed learning.

Problem-oriented learning is student-directed. During self-directed learning, students should be able to access, study and integrate information from all the disciplines that might be related to understanding and resolving the particular problem they are working with – just as people in the real world must recall and apply information integrated from diverse sources in their work. Allowing the problem to be the organising focus for student learning, helps to ensure that the application of information from various relevant fields enhances meaning-making. Collaboration (with peers, tutors and facilitators) is essential in problem-oriented learning, and tends to occur naturally. Before completing their work on a problem, the students should reflect on what has been learned and determine if there are concepts missing in their overall understanding, or whether additional skills are required. This important step helps convert procedural knowledge gained through problem solving into declarative knowledge for use and recall with other problems in the future (Moon 1999a, 1999b). The following case study illustrates problem-oriented learning in the context of teacher education:

Case study 14: Undergraduate physical science teacher education

Description: Undergraduate pre-service science teachers were asked to address the problem of heating and cooling a house at a point in the future when fossil fuels have been exhausted. The house was situated in a region where cloud cover and a lack of consistent winds and fast moving water prevented the use of solar, wind, and water power. As a result, students had to design a house that was heated and cooled solely by chemical means. The chemicals made available to the students were road or melting salt (CaCl_2), baking soda, and water. The students were not given any information about the exothermic or endothermic properties of these chemicals. The students had access to the popular Texas Instruments TI-83 calculators, calculator-based laboratories with temperature probes, desktop computers, chemical indexes, and physics texts. In the course of the lab, students determined the solubility of the chemicals and amount of heat produced and absorbed by varying amounts of the chemicals in varying amounts of water, as well as the solubility of these chemicals. If the students were not using conventions such as specific heat or calories they were encouraged to do so through the use of guiding questions from the instructor. Students also contemplated different approaches for dissipating energy to different areas of the house, as well as how to dispose of the chemical waste, which are both dilemmas inherent to this problem. As an assessment of this PBL activity, in addition to observing students' progress, the lecturer was able to examine the equations recorded in student journals. Since this activity was performed in a pre-service teacher course, the lecturer asked the students to evaluate the activity and describe what they thought were positive and negative outcomes of this approach. Students mentioned that this approach seemed frustrating when they were uncertain

of whether their attempts to arrive at solutions were adequate, but they thought the process was much more realistic and true to scientific inquiry. They appreciated the freedom to design and test different possible solutions to problems. During subsequent class discussion, the students also mentioned how they were better able to understand and recall the material from the lab because they had created the testing procedure as opposed to having it provided to them at the outset.

HEQF (equivalent): Level 6 courses in a Level 7 qualification.

Resources: The lecturer and students had access to a school science laboratory; sufficient time was scheduled for the PBL process, which included debriefing and reflection.

Source: Nowark & Plucker, 1999.

It has been shown that both PBL and problem-oriented learning are useful in preparing students for the real-life problems and scenarios that they are likely to experience in the workplace. In the following case study, modified PBL was used to prepare health practitioners for a practicum:

Case study 15: Modified PBL as preparation for a practicum

Description: This case study shows the use of modified PBL in the form of learning scenarios within an inter-professional education curriculum. Inter-professional education has been promoted as a method of enhancing the ability of health professionals to learn to work together. In order to help students to transfer their learning to novel situations in the workplace, students were challenged with progressively more complex tasks that reflected the reality in which they would be working. Using scenarios, drawn from actual experience, the lecturer introduces experiential learning processes that will be drawn on in the WPL context. The benefits of using this approach are heightened when students are preparing for a workplace practicum, although the use of scenario learning can also be appropriate in other situations when knowledge should be applied. The classroom learning context was structured using the five elements of best practice to prepare students for WPL, namely: 1) positive interdependence, 2) face-to-face promotive interaction, 3) individual accountability, 4) interpersonal and small-group skills, and 5) group processing. The learning process itself was approached from an experiential learning framework cycling through the fourstage model of planning, doing, observing and reflecting. By using increasingly complex and relevant cases in cooperative groups with an experiential learning process, inter-professional education can be successful. This case study suggests that teaching practices in inter-professional education techniques involves facilitation rather than direction, and includes three predominant factors: 1) advising students about what, how, and why they are learning, 2) using active teaching strategies with students, which are progressively structured to build upon, and follow from, the previous activity, and 3) concluding the teaching session by reviewing and summarising the key learning points. This case study points to the need to foster students' prior knowledge in the classroom to facilitate the transfer of learning. For knowledge to be transferred, prior learning and new learning need to be integrated, and applied to the context of the work environment.

HEQF (equivalent): Level 6 courses in a Level 7 qualification.

Resources: Academic lectures in related health science programmes met with clinical staff to develop the learning scenarios, and to schedule times for students from different disciplines to work together on selected problems.

Source: D'Eon, 2005.

4.4.3 Project-based learning

Students' engagement with work-based projects can enhance the quality of their learning and can lead to higher-level cognitive development as they address complex issues. PJBL teaches students complex processes and procedures such as planning, managing and communicating. Accomplishing these goals requires time for both teachers and students to master the strategies necessary for successful PJBL. Because project work involves many different types of projects within the framework of a single subject it can be demanding on staff resources.

Case study 16: A Finnish polytechnic example – project work in a truck cab firm

Description: Third year Industrial Engineering students are divided into four groups within the institution, each group representing the different functions of the truck cab firm (production, finance, logistics and accounting). Each group is asked to step outside the institution and do in-depth research and analysis of one function of the firm. This involves limited experiential work, observations in the firm, interviews with the firm's members and reading up on the firm so that they really come to know that part of the firm. Once they really know how one of the functions of the firm works, they are asked to identify dilemmas or issues which arose.

The next step for students is to ask the question - 'If this is what the firm is currently doing, and this is the issue that is arising, how can they extend their current practices to deal with it?' In identifying the issue and in suggesting ways to deal with it, learners are asked to mobilise what they have learnt in the institution in new and innovative ways - new because they have never seen these problems before and innovative because they have to bring their academic and work knowledge simultaneously to the problem in order to come up with a creative solution.

The solutions the groups come up with are not simply theoretical. The students are required to write these up and present them persuasively to the company; they have to say why they think the company could benefit from such changes. The project involves another level of knowledge development. The academic curriculum is interrogated from the point of view of the students' work experiences. This is a mirror process of the one in the workplace in which academic knowledge is now transformed.

HEQF (equivalent): Level 7 course in a Level 8 qualification

Resources: Students with their tutors are asked to identify gaps and areas to be mutually developed and receive feedback from the tutors and their peers. They are also expected to present their ideas at the conclusion of the project to the workplace units.

Source: Miettinen & Peisa, 2002.

There are two important issues to be addressed in PJBL. Firstly, the level of student involvement in a project, and, secondly, whether the students are prepared (both socially and academically) for the level of the work (Hager and Beckett, 1995). Student autonomy is one of the hallmarks of PJBL. In undergraduate PJBL it is prudent to introduce student autonomy in stages, depending upon students' levels and experience. Before planning the project, it would be necessary to decide how much students should be involved in its design and how much autonomy they should have in carrying out project activities. There will be a need to support students in workplaces, as well as to provide student support and feedback mechanisms as well as procedures for dealing with any feedback received, whether on student progress or the employment experience (see WPL below).

Service learning has become a standard practice in many South African universities to address the need for university-community engagement, and for the building of civic responsibility within students. Service learning can be understood as a form of PJBL. In the following case study, Civil Engineering students engage in a community-based project:

Case study 17: Service learning in the Built Environment

Description: Community engagement has become one of the criteria for the quality assurance of higher education. Service Learning (SL) has been seen as a means to implement this, and has been conceptualised in the South African context as a way of enabling students to learn from experience, while preparing them for responsible citizenship in a changing world. First year Civil Engineering students were brought in to assist a community in a new formal settlement with the provision of building services, as well as training community members in basic building skills.

HEQF (equivalent): Level 7 course in a level 8 qualification

Resources: SL requires a partnership between the university, service provider, and community representatives. This partnership and collaboration is of temporary duration, for the length of the SL programme. SL responds to relatively transient needs and, as a result, does not have the infrastructural support that the Health Science model generally has (that is, links to a hospital, etc.), by virtue of their long established relationships with the host institution.

Source: October, 2007.

4.4.4. Workplace learning

The use of work-integrated theoretical learning, PBL or PJBL and related pedagogies prior to work placement are helpful in preparing students for successful WPL (Harvey, Geall & Moon, 1998). Where academic staff are unfamiliar with the demands of WPL and the assessment of learning through practice, staff development or industry collaboration is required to support student learning. Case study 18 shows how PBL, PJBL and WPL are incorporated in a Mechanical Engineering programme:

Case study 18: WPL in Mechanical Engineering

Description: The qualification is competency based. At the Hogeschool van Arnhem and Nijmegen (HAN) a competence is defined as the ability and attitude to apply knowledge in different contexts. Therefore a graduate would be expected to perform a professional task. Undergraduate students lack experience, and this has to be addressed by the pedagogy. Students develop their competences in a social setting of groups, working at tasks. Obviously they obtain basic knowledge in individual learning – mathematics, mechanics, materials, etc. – in lectures. Such knowledge is always integrated into practical cases. In the Netherlands the qualification model is determined by the Central Organisation of Engineering Courses. At HAN University the content is defined in terms of professional tasks, e.g. Construction Engineer. The pedagogy used encourages students to collect evidence for their competences inside and outside the University (i.e. in companies). It is therefore a very flexible pedagogical model.

Students construct their applied knowledge in practical problems, which improves student motivation. They understand the meaning of this knowledge and they know when to apply it. By cooperating in

their group they can help each other: it is a learning process for both the person who explains and the person who learns. This cooperation develops a professional attitude. Students manage their own education. They can prove their competences at a time of their choice. They have a personal coach to assist them in this process. Students have the right to apply for an assessment-interview twice a year. Evidence to prove their competences can be varied: reports, testimonies, reviews, checked examinations, oral examinations, presentations, products, drawings, computer models, etc. A self-assessment is always part of the assessment-interview. The assessor is in principle not their lecturer, and never their personal coach.

In the first year the curriculum model is PBL, an instructional method that challenges students to 'learn to learn', working cooperatively in groups to seek solutions to real world problems. These problems are used to engage students' curiosity and initiate learning the subject matter. PBL prepares students to think critically and analytically, and to find and use appropriate learning resources. Students have lectures, practical lessons, etc. for approximately 20 hours a week. In PBL the learning content is more dominant than in projects, which is a necessity for learning basic knowledge.

In the second, the third and the fourth year of their study the curriculum model is PJBL. Students learn in project groups. Projects are based on real life problems and are often carried out in cooperation with a company. Project duration is half a semester. Every project has its own theme: e.g., control systems. Students have lectures for approximately 10 hours a week. In their projects students will learn to solve more complex problems, which approximate to real life issues.

HEQF (equivalent): Level 8 professional Bachelor's degree.

Resources: Offering the qualification is challenging in financial and organisational terms. Students have academic lecturers and personal coaches. The university sets up linkages with appropriate companies, who also provide some facilities.

Source: De Jong, 2007.

The above case study highlights how students, particularly if they are full-time students at the university, need to be adequately prepared in order to learn in a work environment. Students need to understand the expectations on them as employees (even if unpaid), such expectations could include language proficiency and completion of all subjects at specified levels. In some professional areas of work, employers require the university to certify students' fitness to practise. These expectations, as well as practical arrangements made, should be provided to students in the form of guidance documentation. Student induction in the placement environment has been found to be helpful (Gosling & Moon, 2001). Information should be provided to students regarding how to record their progress and achievements and fulfil the assessment of learning outcomes, particularly in those activities with which they might be less familiar, such as the production of portfolios or reflective journals. Students will need guidance on what to do if there are work problems which might affect their ability to achieve the learning outcomes. Case study 19 illustrates the potential for student learning in the workplace. In this case study, students do not go to the workplace to practice basic skills, but to learn from experts:

Case study 19: Chemistry experiential learning project

Description: Chemistry students at a university of technology spend a year in industry. Students working at the local Municipality are firstly rotated through the various laboratories in the water and sanitation department and are required to successfully complete a set of tasks against outcomes. The tasks are supervised by experienced staff in each laboratory. As one supervisor stated ‘we have the most up-to-date equipment which students learn to use. We have top-class scientists and everybody is willing to help the students with any problems they may have, so much so that when the students are not around they begin to ask where they are. In the second half of their industry experience they work on a small scale research project. These are projects which the regular staff would like to do but do not get around to doing. They are something useful for the industry in that they fill a gap. At the Municipality one student was investigating the optimal pH for the precipitation of Zinc, cadmium and nickel, which are common in industrial effluent but must be removed before the water is recycled.

HEQF (equivalent): Level 7 in a Level 7/8 qualification.

Resources: Support is provided by practising chemists with only limited support from the academy. The lecturers mostly help with the conceptualisation of the project and respond to email enquiries from students.

Source: Garraway & Volbrecht, 2007.

On-line resources have become important ways of supporting students in the workplace. Case study 20 shows how Internet technology and social media can keep students and academic staff in contact, enabling students to obtain support for their workplace practice:

Case study 20: On-line resources for WIL at the Royal Melbourne Institute of Technology (RMIT)

Description: A comprehensive suite of online resources was developed by the WIL centre at RMIT to support university students undertaking a co-operative or workplace year as a structured part of their studies. A curriculum designed to emphasise reflective learning, collaborative learning and life-long learning principles took on a more personalised form, with the incorporation of student stories and experiences that students were required to post on the discussion forum. Five academic programmes, involving three faculties, incorporated some or all of eight self contained online modules, which were linked from within the menu of the university’s Blackboard learning management system. This allowed for shared resources alongside separate announcements, discussion and administration areas. Preliminary outcomes show increased student satisfaction, greater reflective practice and improved learning. Staff reported that the on-line format reduced administration load and were enthusiastic about this new way of supporting students in their off campus placements.

HEQF (equivalent): Level 7 in a Level 7/8 qualification.

Resources: Academic staff work with curriculum specialists from the RMIT WIL unit as well as technical support staff to develop the website and related functions. The website was regularly updated with messages, documents and information by the academic staff.

Source: Atkinson, Rizzetti & Smith, 2005.

Questions to ask about teaching and learning in a WIL programme:

1. What sort of teaching, facilitation, supervision and/or mentoring will students need?
2. What technologies are used in the programmes? How do these compare with what is used in the related industry/profession?
3. Who are the people involved in higher education/workplace settings? (e.g., Is it relatively unusual for people within a profession to only work with other members of the profession on in multidisciplinary teams?)
4. What rules (explicit and implicit) do the academic programmes operate by? (e.g., Are there penalties for late coming? What rules does the related workplace adhere to – punctuality? deadlines?)
5. What is the division of labour in the classroom setting? (e.g., Is there group work? Does the lecturer have sole responsibility for input, information giving?) What division of labour pattern is evident in workplace settings?
6. What kind of communication practices are required in higher education (e.g., only academic essays/only examinations?) What kinds of communication practices are common in related work places? (e.g., memo's? technical reports?)

ASSESSMENT OF/FOR WORK- INTEGRATED LEARNING

In this section, we turn to matters of assessment. As previously explained, assessment should be aligned with the intended outcomes of the subject or programme, assessment tasks should be at the appropriate HEQF level, the assessment should be aligned with the particular WIL focus and form (e.g., problem-based learning), and the teaching and learning activities – whether classroom or workplace-based, should have prepared the student for the assessment task. Often formative assessment (assessment for learning) is seen as part of the teaching and learning activities, unlike summative assessment which aims to measure the learning students' have achieved at the end of the course. The important point is that students need to be well prepared for assessment, particularly in the case of 'high stakes' assessment tasks. Figure 5.1 indicates the focus of this section of the guide.

Table 5.1: Assessment in the curriculum

Intended outcomes (or goals)	HEQF Level	Curriculum form	Teaching and/or learning activities	Formative assessment task	Summative assessment task
e.g., problem solving	HEQF Level 5	Problem-oriented learning	The lecturer presents case studies;	Students self-assess their draft reports,	The student submits a report that
			students work in groups to answer questions related to the case study	using a checklist related to assessment criteria; there is peer feedback on editing.	addresses the lecturer's questions on the case study.
Etc.					

5.1 Principles of work-integrated learning assessment

WIL is based on the same principles that should guide all assessment planning, namely that assessments should be appropriate, fair, transparent, formative as well as summative, valid, authentic, and consistent. Student learning should be demonstrated to be appropriate for the qualification and should be assessed wherever it takes place or is provided. Further detail and examples of the principles of WIL assessment are provided in Table 5.2:

Table 5.2: The principles of WIL assessment

The assessment should be:	Descriptions and examples
Appropriate	Examples of appropriate WIL assessment tasks involve work-oriented report writing and simulation exercises pertaining to workplace specifics.
Fair	All assessment tools used should be as free of cultural bias as possible, should be based on explicit criteria regarding what is required of students, and be accessible to all candidates.
Transparent	Candidates should receive clear instructions about the venue, time and duration of the assessment. In the case of workplace assessments, these should be conducted during times mutually agreed upon by the workplace and the candidate.
Formative as well as summative	Complex performance often requires systematic understanding which may include elements of more technical practices. In this regard, the candidate should be provided with opportunities for formative feedback to gain additional knowledge and experience prior to final assessment, particularly in 'high stakes' contexts of assessment.
Valid	All evidence gathered from activities and task can demonstrate that performance outcomes have been met, and that the assessment procedures, methods and tools used were appropriate to course outcomes.
Authentic	Assessment should prepare students for the type of knowledge and practices required in modern workplaces and society. Various simulation, role-plays and on-the-job activities can be used to simulate the actual workplace performance.
Consistent	Tools and exercises should be piloted and moderated. While it may not be possible for all assessment tools to be used repeatedly by any other assessor to deliver the same results, the assessor should produce simple clear and well documented procedures, clear and unambiguous assessment criteria. When assessing complex performance it is preferable to have more than one assessor.

5.2 Formative assessment for work-integrated learning

Formative assessment is often described as assessment for learning. Providing feedback to students on a draft or on a 'trial run' are forms of formative assessment. Formative assessment is thus communication between teacher and student to enhance, recognise and respond to the learning. Assessment can also be thought of as 'formative' when the feedback from learning activities is used to adapt the teaching to meet the learner's needs. Universities teachers are engaged in formative assessment in the classroom, by responding to questions, asking questions and interacting with students during learning activities. But more formal or structured forms of formative assessment can also be used to prepare students for summative assessment. It is important that formative feedback be given to students as soon as possible, as delayed feedback can cease to have meaning to the learner. In this regard, it has been difficult for academic staff, located at the university, to provide formative feedback to students who are engaged in workplace projects or work placements. In order to overcome this, a design department used Facebook and blogs to communicate with students on work placement, to enable them to obtain formative feedback on their work:

Case study 21: Formative assessment using Facebook and blogs

Description: The Design department investigated the potential of Facebook and blogs for enhancing students' learning in work placements. In-depth interviews with lecturers using Facebook and blogs and focus groups with their respective students showed that the appropriate use of Facebook groups and blogs can enhance students' engagement in learning activities of an academic nature in workplaces, and can help students to feel less isolated in workplaces by enabling them to keep in touch with, and learn from, peers in a range of workplaces.

HEQF Level: 7 in a four year professional Bachelor's degree.

Resources: Most students had access to an Internet enabled computer at the work site, or had a computer-enabled cellular telephone.

Source: Ivala & Gachago, 2011.

5.3 Summative assessment of work-integrated learning

Summative assessment is often described as the assessment of learning as summative assessment is used to indicate the extent of a student's success in meeting the assessment criteria used to gauge the intended learning outcomes of a module or programme. Summative assessment is the process of evaluating (and marking) the learning of students at a point in time. Summative assessment can be either internal (conducted by a member of the university) or external (conducted by an academic at another institution, a workplace representative, or an awarding body). What makes the assessment summative is that it is used to measure attainment against a particular specification or 'standard'. Summative assessment will therefore be systematically designed and should always be quality assured. Many South African universities use continuous assessment, which involves the assessment of a student's progress throughout a course of study rather than exclusively by examination at the end of it. Continuous assessment can be understood as a series of summative assessments, as each assessment counts towards a final mark. Some of the assessments may be considered 'high stakes' assessments, as they count for proportionately more marks than others. A particular difficulty with some forms of project-based learning and workplace learning is how students collect evidence for assessment. Traditionally, students keep logbooks or build portfolios to show their experience and the skills development. Many of these paper-based forms of assessment are inadequate in terms of demonstrating students' mastery of complex practice. In the example below, taken from a Forensic Pathology programme, video-diaries were used in place of paper-based assessment.

Case study 22: Summative assessment of student-generated video material in postgraduate Forensic Pathology training

Description: When medical practitioners are trained as forensic pathologists, they engage in university-based theoretical and practical training, but are also required to complete a number of autopsies at state mortuaries. To demonstrate that they have performed these autopsies, the candidates usually complete a log-book that is 'signed off' by the supervising pathologist as part of a specialist exit examination for all postgraduate students. Subsequently, all students in forensic pathology were required to submit logbooks of practical work and portfolios of learning, which contain details of practical learning experiences in topics such as anthropology, odontology, blood splatter analysis, firearms/ballistics/tool marks, and autopsy techniques. No specifications existed for the format of the logbook and portfolio, but the norm was to present these in a paper-based format. In a practically

orientated environment such as Forensic Pathology, the objectivity and validity of a paper-based logbook and portfolio system is questionable, because it will always fail to address all criteria in the assessment process. When the Forensic Pathology department replaced the paper-based assessments with video diaries, all registrars in Forensic Pathology in South Africa found that the video-diaries enabled them to judge students' levels knowledge more accurately. A difficulty experienced had to do with candidates' individual skills in using video technology as part of the process of portfolio compilation and for assessment. It was felt that wide scale implementation of a video-based portfolio system is feasible, and that, if the technical challenges can be solved, the student-generated video-based portfolio is an appropriate method of providing evidence of technical skill and learning for post graduate students.

HEQF Level: 9, Medical Specialisation programme.

Resources: Each candidate had to have a digital video camera, a tripod and, for some procedures, a head-mounted video camera. They were required to download video files and email them to the university teacher in charge of the programme; or burn these to disk and courier to the university in areas where there was no, or slow, Internet access.

Source: Dempers, Janse van Rensburg, Verster & Bezuidenhout, 2010.

5.4 Developing assessment tasks

When considering assessment methods, it is particularly useful to think first about what qualities or abilities you are seeking to engender in the learners. Nightingale et al. (1996) provide seven broad categories of learning outcomes which are listed below. Within each category, appropriate methods of assessment are suggested.

5.4.1 *Demonstrating knowledge and understanding*

As in general education, WIL requires students to describe, explain, recognise, identify, relate, analyse and synthesise. Students would generally demonstrate their understanding in written or oral examinations, or in academic essays. In WIL, a range of more work-oriented assessment tasks can be developed, such as writing reports that are similar to those done in professional practice, or providing comments or feedback on previously written reports. Students could also devise an encyclopaedia entry on a relevant topic, produce a glossary of terms, or write an answer to a 'client's' query.

5.4.2 *Thinking critically and making judgements*

Developing arguments, reflecting, evaluating, assessing, and judging are important for both general and professional education. In general education programmes this ability is usually assessed by requiring the students to write academic essays. The academic essay is an important tool both for assessment and for learning, but is an academic genre that is not found in the workplace. Instead of academic essays, students can be asked to write reports, to make journal entries, or to create a blog, to write a range of letters, present a case study, prepare a briefing paper for a specific meeting, write a book review, or article for a professional journal, or write a newspaper article, or comment on a news item that is relevant and topical.

5.4.3 *Solving problems*

The process of identifying problems, posing problems, defining problems, analysing data, reviewing, designing experiments, planning and applying information is central to WIL. Assessment tasks that are

related to problem solving include addressing case studies and problem scenarios, particularly those that simulate or prepare students for workplace problems and involve students in research and information finding. Group work is important in this regard, and assessment methods that reward both the group and the individual contribution within the group will be necessary.

5.4.4 Performing procedures and demonstrating techniques

The assessment of complex performance is fundamental to WIL. Assessment methods are likely to involve computation, taking readings, using equipment, following laboratory procedures and protocols, and carrying out instructions (with understanding, rather than mechanically). Typical assessment forms include demonstrations, role-play, video-diaries, poster presentation, laboratory reports, preparation of an illustrated manual on using the equipment for a particular audience, and a report on observation of real or simulated professional practice.

5.4.5 Designing, creating, performing

Professional education across many disciplines requires students to visualise, design, produce, create, innovate and ‘perform’ in different contexts. Tools to assess innovative and complex performance include portfolios, simulated performance (e.g., in virtual environments), and presentations.

5.4.6 Managing and developing oneself

The development of intra-personal skills are a neglected area of WIL. Professionals need to work both co-operatively and independently, be self-directed and manage time and tasks effectively. Assessment tools in this regard include journals and blogs, portfolios (which can be collective or individual) and learning contracts.

5.4.7 Accessing and managing information

Information literacy is a key competence for professional education. This includes: researching, investigating, interpreting, organising information, reviewing and paraphrasing information, collecting data, searching and managing information sources, observing and interpreting. Assessment tasks in this regard include students developing annotated bibliographies, research reports and various problem-solving reports.

5.5 Assessment criteria

Without assessment criteria, students will not be clear on the requirements of the task. Providing clear assessment criteria are therefore essential for fair and transparent assessments. It can be helpful to the student to provide assessment rubrics that are related to the assessment criteria. Rubrics provide examples of the scoring scale that is used to evaluate student work. A rubric guides the student in how the work is to be judged on a particular task and provides at least two levels of performance for each criterion. In the example below, from a Journalism course, the assessor has provided clear assessment criteria and examples of three levels of achievement:

Case study 23: Students in a Journalism programme produce a newscast

Description: As a short assessment task, students were required to gather information from internet news sites, feeds and newspapers. They had one hour in which to format a rundown and build a 30-minute newscast. In this case, the story selection was weighted more because the assessment was primarily concerned with whether the student had good news judgment and could identify what the important stories of the day were.

ASSESSMENT CRITERIA	GOOD	AVERAGE	WEAK
Lead story (10)	Appropriate for the day	Feasible	Definitely not feasible
Flow (10)	Stories flowed well in a logical order	Most of the stories tied well together	Disorganised and not logical
Story selection (20)	Stories are the most important or interesting for the day's newscast	Some of the stories are appropriate but a few are unlikely	Stories are not worthy or interesting enough for the day's newscast
Proper format (10)	The format supports what is available to the Producer	The format supports most but not all of what is available to the Producer	The format does not support what is available to the Producer

HEQF (equivalent): Level 6 (second year of a four year professional Bachelor's degree)

Resources: Students need access to the Internet, to a reading room with newspapers, television news channels, etc.

Source: Mueller, 2010.

5.6 Assessment for different WIL types

In this section, we focus on assessment strategies for the four WIL curricular types.

5.6.1 Work-directed theoretical learning

Methods for the assessment of work-directed theoretical learning include short problem-based calculations, case studies and scenarios, a variety of applications that are relevant to main applied discipline, written or oral discussion of topical issues and debates and short reports (oral & written) on site visits. In work-directed learning it is useful to work with a workplace partner, who can act as a moderator for the overall assessment plan, individual assessment tasks (including assessment criteria and rubrics, etc.), the assessment of marking practices and feedback and improvement cycles. Assessment should simulate workplace models where these are appropriate. For example technical reports might replace academic essays as academic practices are aligned with appropriate workplace ones (Dias et al 1995). The following case study of written assessment in a Nursing programme makes the best of both worlds:

Case study 24: Written assessment in a Nursing programme

Description: Nursing education comprises both theoretical and practical components. Typically the assessment of theoretical knowledge is done through academic essays on a variety of topics. Academic essay writing is extremely burdensome for some students, who become confused between the audience and purpose of academic and professional writing. An intervention at a nursing college tried to find a compromise. This required the trainee nurses to simulate professional writing, such as patient care plans and patient reports in the theory class, but provide more 'academic' detail than the

professional genre would normally require. This intervention bridged the gap between trainee nurses' academic and clinical writing, with a resultant improvement in their clinical writing practices.

HEQF (equivalent): Levels 5-7 in a Level 8 qualification.

Resources: The writing/communication lecturer worked collaboratively with the nurse educators; clinical practitioners provided examples of good and poor clinical writing, which was used as a resource for the writing class.

Source: Leki, 2003.

5.6.2 Problem-based learning

In PBL and problem-oriented learning, students' problem-solving skills, self-directed learning skills, and ability to transfer their knowledge base in working with a problem should be formally assessed. A component of the assessment of students' progress should come from the self and peer assessment that should occur at the end of every problem. Students need to be proficient in assessing their individual learning progress and that of their peers. The ability to monitor the adequacy of personal performance accurately is essential to the development of life-long, self-directed study skills, as is the ability to provide colleagues with accurate feedback (Longworth & Davies, 1996). Moderators who are drawn from the workplace and can provide authentic workplace problems, together with lecturers, can be curriculum coordinators and work as team to ensure that the problems are at the correct level of challenge. The case study below relates to a problem-based assessment task in an earth sciences programme:

Case study 25: Identifying minerals in a foundational Earth Sciences programme

Description: Traditional methods for teaching involve step-by-step demonstrations and laboratory practicals, followed by assessments in which students identify a selection of minerals based on the demonstrated procedure. In a PBL unit designed to cover the same curriculum, students were told that they were geologists and their task was to identify the minerals in local sites in order to facilitate the modification of local zoning ordinances. Tools and various minerals were made available, and the students worked in small groups to identify the minerals. As student curiosity became engaged, the freedom to explore eliminated student fears of not using the 'correct' method. After preliminary attempts to identify the materials, the lecturer encouraged students to discuss the various methods they employed (i.e., comparing similarities and differences, classifying the various characteristics). At this point, the lecturer introduced the standard method of mineral identification and had students probe the method's strengths and weaknesses. Students were then given the opportunity to apply and expand their knowledge by identifying a new group of minerals. At the end of the unit, after several similar PBL activities, student achievement was assessed by taking students to a local quarry and a wilderness area and requiring them to identify as many different minerals as possible. In this setting, the students had the opportunity to work in the field as real geologists. In addition to the teacher's field-based observations, the students were also asked to log in their field notebooks what they found, where it was found, and describe how and why they identified it as they did. Finally, a debriefing discussion was held in which individual students and small groups reflected on and shared their experiences with the rest of the class to compare and contrast the creative skills employed. The authenticity of applying skills to a real world problem made this PBL assessment valid and a learning experience for students.

HEQF (equivalent): Level 5 course in a Level 8 qualification

Resources: The lecturer consulted practicing geologists, students were provided with the necessary professional-standard equipment and transport to the site.

Source: Nowark & Plucker, 1999.

5.6.3 Project-based learning

Projects involve students in regular exhibitions and assessments of their work in light of personal, academic and workplace standards of performance. Clarity on the assessment process in project work is probably more important than with traditional programmes because of the demands it makes on academic staff.

Case study 26: Integrated tasks in Mechanical Engineering

Description: Students in a Mechanical Engineering Department studied the subjects and disciplines traditionally associated with Mechanical Engineering: Mathematics, Physics, Fluid Dynamics Materials, Manufacturing, Technical Drawing, and Communication. In addition, students, at every level, also participate in an integrated task (IT), which was intended to bring the separate subject areas into a meaningful relationship. The IT has a planning phase, a design phase, a manufacturing phase, and a reporting phase, all of which are assessed. Students are given a 'project brief', put into project teams and, with limited support and guidance from a mentor (who is one of their lecturers), are expected to accomplish the task. The students plan the project, set goals, outputs, and deadlines, order materials, book time in the workshop, and generally take charge of their own projects. The academic staff meet to decide on a suitable project and to develop a project brief. Ideally, the IT has both relevance to the real world of Mechanical Engineering and includes sufficient coverage of the academic subjects – a task that is difficult to achieve. The staff collectively developed criteria, not only for their subject areas within the project, but for the IT as a whole.

HEQF (equivalent): Level 7 courses in a Level 8 qualification.

Resources: It was recommended that there should be additional formative assessment in the form of debriefing and reflection, and that the report writing criteria should be more closely aligned to professional standard technical reports. Greater workplace involvement in the planning and assessment of ITs was also recommended.

Source: Breslow, Garraway, Winberg, Wright & Wyrley-Birch, 2005.

5.6.4 Workplace learning

Appropriate forms of the assessment of experiential learning should be part of a coherent assessment strategy. Experiential assessment might include innovative forms of assessment, such as learning diaries, portfolios, student progress files and other means by which learning through and at work can be documented – together with the relevant marking criteria. Case study 27 provides an example of assessment criteria used in WPL:

Case study 27: Assessing WPL in Chemistry

Description: Students on work placements were required to conduct a research project on a work problem and reflect on what they had learned. The assessment method made use of a portfolio which had the following components: a) an initial proposal, b) a technical report on the nature of the problem, the steps to solve the problem and results and recommendations/conclusions drawn from the results, and c) a reflective report which described what had been learned in the course of doing the project.

The assessment criteria were as follows:

- The problem is clearly outlined. Relevant content and concepts learnt at university are identified and discussed in response to the problem. Gaps between what was previously learnt and what new information needs to be gathered are identified.
- New Information (content and concepts) from appropriate chemical and related literature is gathered and used systematically.
- The steps and methods to solve the problem are clearly outlined. Relevant methods learnt at university are discussed. Gaps between what was previously learned and modifications or new methods required to deal with the problem are described.
- Approaches to solving problems in that workplace are described and evaluated.
- Scientific and technical data and results are compiled, organised and presented.
- Recommendations/conclusions are drawn from an analysis of the results and from the literature. New ways of approaching problems that have been discovered in the research journey are written up. Where approaches to the problem have opened up new ways of doing or thinking for the workplace, this should be described.

HEQF Levels: 6-7

Resources: University teachers and workplace supervisors met to negotiate the assessment criteria for the WPL programme, students were provided with feedback and on-going support during the work placement.

Source: Garraway, Volbrecht, Wicht & Ximba, 2011.

The authors of case study 28 argue that WPL should equip students for work tasks beyond the university setting, including a focus on learning outcomes, graduate attributes, the promotion of relevant skills for professional practice. In case study 28 the focus is on generic, 'life-long learning' criteria for the students on work placements. These criteria were developed in collaboration with workplace partners:

Case study 28: Assessment of WPL for life-long learning

Description: Academic and professional partners at the University of Sydney collaborated to design assessment tasks for students on work placements. University-based assessment commonly focuses on determining the level of student attainment, in response to academic issues, with students relying on feedback provided by others to authenticate and judge their learning. Thus, students are recipients of assessment, and do not routinely have an active role in it. The partners felt that the workplace presented challenges to students with regard to improving performance following feedback, as well as self-assessment. The partners felt that in order for students to become active lifelong learners, they should be prepared to be less dependent on summative feedback and comments from others, and more able to identify the knowledge and skills they needed to learn. The partners developed assessment tasks that enabled increased student participation in practice, promoted students' confidence within the work environment, and encouraged students to engage in self-assessment actively. The partners believed that these assessment tasks were better aligned with professional practice and the development of skills for life-long learning. The authors conclude by describing eight specific factors that can be used in WPL to increase the sustainability of assessments, and assessment with long-term learning. These factors include: standards-based frameworks, teacher beliefs, fostering student capacity to learn, the separation of comment from marks awarded, focusing assessment on learning to improve performance, development of self-assessment abilities, encouraging reflective assessment, and the use of formative feedback on assessment tasks.

HEQF (equivalent): Levels 5-6

Resources: There were a number of meetings between academic and workplace partners to design, plan and implement the WPL assessment tasks. The academic partner took responsibility for the awarding of marks for the assessment, while the professional partner involved provided feedback and moderated some of the assessment tasks.

Source: Boud & Falchikov, 2006.

The assessment of WIL shapes the attitudes and understandings of students, staff and workplace partners. It is therefore important that university teachers are clear on what they wish to achieve with each assessment task, and how their assessments are aligned with the overall subject and programme.

Questions to ask about assessment in WIL:

1. What sort of assessment tasks are logical in the light of the curricular modalities selected?
2. Can theory and practice be integrated in assessment tasks?
3. What are appropriate assessment criteria?
4. What are appropriate levels of achievement? – and can rubrics describe these?
5. Are logbooks and checklists appropriate?
6. Which outcomes should be assessed by university teachers?
7. Which outcomes should be assessed by practitioners (as well as university teachers)?

PARTNERSHIPS FOR WIL

6.1 Introduction to partnerships for work-integrated learning

WIL builds linkages between workplace knowledge and the academic curriculum, and helps students to transfer academic knowledge to workplaces; for this reason, WIL cannot occur without partners who represent the different knowledge fields. The effectiveness of WIL depends to a major extent on the commitment of both academic and professional partners. In WIL programmes there are partners who are internal to the university and partners who are external to the university. Internal partners include university teachers and departmental colleagues (including faculty officers and placement officers), faculty or institutional centres or units that support WIL, and students. Graduates and past students are particularly valuable as they can provide useful insights and advice for WIL planning and implementation. Thus maintaining contact with workplace practice through alumni is one method that is effective both for university teachers and present students. External partners include potential employers, professional practices, companies (particularly those that have a commitment to education), community partners (including non-governmental organisations, community-based organisations, non-profit organisations, etc.), government departments, Sector Education and Training Authorities (SETAs) and professional bodies. In large companies, the training manager, who is usually located in a human resources department, can be a supportive partner for WIL.

6.2 Partnerships for the different work-integrated learning curricular modalities

University teachers of professional programmes often face particular difficulties with respect to professional partners. They may find discrepancies between practices that are recommended by the research or professional literature, and those that are actually preferred and accepted in the workplace. Should the criteria for effect practice be derived from academic research and theory or from actual practices? Should university teachers be in the business of learning how things are done in the workplace or of improving inadequate practices there? The answer has to do with interchange and learning in both contexts; but since these two agendas can conflict with each other, managing them both is no simple task, and university teachers need to balance one against the other. In this section we explore the nature of partnerships with regard to the different WIL curricular modalities.

6.2.1 *Partnerships for work-directed theoretical learning*

While WDTL usually takes place in an academic classroom, the introduction of workplace concerns into the academic programme has benefits for student learning. It is not possible to include workplace issues without workplace partners. In this regard, the roles of the partners in WDTL are described below.

Role of internal/academic partners

The main responsibility of university teachers is to ensure that course content is accurate and up-to-date. In professional programmes an important part of this is ensuring that the academic programme tackles

important workplace concerns. To achieve this university teachers could:

- Join the professional council, association or other relevant body (and attend meetings and presentations – particularly those for continuous professional development);
- Attend professional or industry conferences and presentations;
- Network, e.g., attend industry breakfasts;
- Read the professional journals (and encourage students to do the same);
- Invite prominent professionals, recently qualified students, and potential employers to address students and staff;
- Invite prominent professionals to assist with the assessment of students' work (particularly work that has a professional or work-oriented focus);
- Invite professional or industry representatives to offer an award to recognise student achievement.

Role of the external/professional partners

In work-directed theoretical learning, workplace partners play a minor role, but their presence in the programme is important to connect theory-based learning with 'real-world' issues, and to this end, the role of the professional partner can include:

- Arranging a site visit for students and staff to a workplace or other relevant site;
- Giving a guest lecture, usually on a topic that is relevant to the academic programme, from a workplace perspective;
- Assisting with assessment as an external examiner or moderator, or as part of an assessment panel.

6.2.2 Partnerships for problem-based learning

Although PBL and other forms of problem-oriented learning are largely classroom-based forms of learning, curriculum development and the facilitation of student learning benefit from the input of both internal and external partners in a number of ways.

Role of the internal/academic partners

When developing a problem, scenario or case study in collaboration with a workplace partner, university teachers should:

- Ensure that the problem, scenario or case study has sufficient basic content and skills (e.g., mathematics or physics) embedded in it;
- Ensure that the problem is at the appropriate level for the students;
- Include assessment criteria that are aligned with intended outcomes;
- Ensure that there is formative feedback early on (if the problem is significant, or if the task is for assessment purposes);
- Ensure that the problem has an appropriate time-scale, facilities (e.g., laboratory space) and resources allocated to it.

Role of the external/professional partners

The role of workplace partners includes:

- Suggesting workplace problems, scenarios or case studies (from the world of professional practice);
- Providing authentic materials from the world of practice;
- Co-facilitating or introducing the problem (e.g., acting as the ‘client’);
- Co-assessing or moderating students’ work, particularly in cases where the problem is a significant assessment task.

Case study 29 provides an example of a partnership between an Environmental Studies university teacher and a representative of the local council to develop ‘new work order’ competencies at the University of Leeds, in the United Kingdom:

Case study 29: Preparing students for the new work order

Description: This example concerns a university teacher seeking Environmental Studies cases from the real world of work that can be transformed into case studies to support the development of work skills, such as problem solving and networking. The process of working with a partner is outlined below:

Step 1: The university lecturer scans workplaces for suitable case studies in terms of pre-identified generic skills such as networking or innovative problem solving. The problem of ‘how to move people out of houses after flood warnings’ is identified. She scans workplaces with a particular type of event, not any event, in mind: one which involves networking, complex group problem solving, etc.

Step 2: Meetings occur between the representative of local government responsible for flooding and the university teacher. She represents the general idea of case studies to the councillor and describes examples of how students have enhanced the council’s ability to deal with issues in the past. So there is gain for the council in helping with cases, as well as benefits for students. The university teacher suggests that the case study could generate useful information for the workplace as well as generate useful work skills in students – elements of the study being indispensable to the workplace.

Step 3: The university teacher asks the council representative specific questions about the flood problem and possible solutions that she needs in order to construct a case study: ‘What are its key features? How was it developed and by whom? How was it solved and by whom? What were the barriers and enabling features in solving the problem? The work problem is being ‘recontextualised’ into academic structures. She hopes, by now, to have enrolled the council representative so she only seeks suitable answers which she can develop into a case study.

Step 4: The recontextualised work event is presented as a case study text to be done over a certain time with certain leading questions (‘What is the issue and what are the possible solutions and which is best?’), modes of working (groups and nets) and possible outputs are identified. Leading questions arrange the work event so as to highlight generic aspects which cross over between work and the academy.

Step 5: The university teacher returns the case study to the council representative for approval and invites further comment and participation to cement the work/academic relationship.

Step 6: The students are introduced to the cases as real situations. Students work on the case study and come up with certain solutions. The academic solutions are matched to real work ones. Students may ask the question ‘How can my solutions be altered to better match the real ones ‘ or ‘How can I extend on and improve on the real solutions?’ The problem is real and involves real workplace competencies; it is to be hoped that students will therefore want to do it, or will perhaps see it as indispensable for their future ability to work successfully.

Step 7: After completing the case, students rework their CVs to show learning from the case (for example their ability to solve societal problems). Students benefit in different ways from doing the exercise.

HEQF (equivalent): Level 7

Resources: There was time invested in meeting with the local council representative, obtaining feedback, and so on.

Source: Garraway, 2005.

6.2.3 Partnerships for project-based learning

PJBL has considerable potential for advanced student learning and for solving ‘real life’ problems in workplaces. PJBL is appropriate for more senior students who, with the support of university teachers, address a real workplace problem, or assist a community in need, using knowledge and skills gained in their course of study. There are extensive resources for initiating, building and maintaining community-based partnerships in the CHE guide on Service-learning in the curriculum (2006).

Role of the internal/academic partners

In PJBL, the university teacher takes on the role of a professional consultant. The university teacher usually plays a significant role in addressing the workplace problem or need. Students will take on a professional identity, which is an important aspect of their development as they learn to deal with clients in a professional manner. The university teacher should model professional conduct at all time, but this should be explicit in PJBL. The academic partners thus:

- Assume a professional identity, and explain issues in professionalism;
- Act as consultants;
- Supervise the students engaged in the project;
- Ensure that the students meet regularly with their ‘clients’;
- Monitor the progress of the project;
- Assess the final product or process, in collaboration with the professional partner.

Role of the external/professional partners

Workplace partners play a major role in PJBL. They identify a particular need or area of work that requires development and, in collaboration with the academic partners, define and shape the work so that there is a match between workplace requirements and the academic programme. Their role is to:

- Invite students to solve an authentic workplace problem;
- Provide students with sufficient orientation to the workplace and the particular problem;
- Arrange adequate time for students to consult with workplace supervisors or mentors;
- Assist with the assessment of the final product or process, in collaboration with the academic partner.

6.2.4 Partnerships for Workplace learning

A key element of WPL is that each student should have both an academic and workplace supervisor. The supervisors play a critical role in developing an effective learning environment, guiding the student through challenging situations, and integrating university and workplace experiences. Without both supervisors, WPL is little more than just ‘work experience’.

Role of the academic partner

The role of academic partner in WPL is a complex one that has many dimensions. The functions and responsibilities of an academic supervisor include:

- Setting learning outcomes (in consultation with the professional partner);
- Establishing effective lines of communication between the student and the professional partner or employer (to ensure that feedback is being provided to both the student and the workplace supervisor);
- Assisting the student to develop their self-learning skills and strategies;
- Identifying and helping to resolve conflicts;
- Assessing the student’s workplace performance (usually in collaboration with the professional partner);
- Monitoring workplace issues, including the performance of the workplace supervisor;
- Assisting the student to develop their personal goals.

Role of the external/professional partner

Workplace supervisors have an equally important set of functions and responsibilities, including:

- Orienting the student into the organisation;
- Setting clear work objectives for the student;
- Assisting in setting learning objectives;
- Monitoring the student’s workplace performance;
- Identifying skill deficiencies and organizing appropriate training/learning opportunities.

A complication for WPL programmes is that academic and professional partners may hold different views as to desirable workplace experience. A shared understanding of what kind of work experience is desirable is an essential prerequisite to work placement. Case study 30 reports on how a group of partners negotiated desirable outcomes for work placement.

Case Study 30: Negotiating outcomes for work placement with partners

Description: Four sector stakeholder groups were involved in negotiating outcomes for an undergraduate science and technology programme: 1) undergraduate students, 2) recent graduates (who had completed work placements, 3) employers and 4) university teachers. The partners identified 24 outcomes as desirable. The emphasis of these outcomes was not on cognitive and technical skills (often termed ‘hard’ skills) rather, the single most desirable outcome identified was the ability and

willingness to learn, followed by analytic, constructive, appreciative, interpersonal, relationship-building, communication, management, leadership, and self-control (often termed ‘soft’) skills, and the ability to integrate these within professional work experiences. It was proposed that classroom-based instruction is unlikely to produce graduates with the desired skills, and that WIL had a role to play in the development of graduate attributes, and complement the theoretical knowledge gained through formal academic curricula.

HEQF (equivalent): Levels 7-8

Resources: A number of meetings were held with all stakeholders to plan the work placement. The meetings were hosted by and arranged by the academic partners; the workplace partners undertook to provide guided learning experiences for the students.

Source: Coll & Zegwaard, 2006.

Work placements present a number of learning opportunities that are rarely exploited, because of a lack of appropriate preparation and collaboration. For example, work placements provide opportunities for students to observe and reflect on the culture of an organisation, leadership styles, gender politics, commitment to health and safety, mechanisms for fostering innovation, and how diversity is (or could be) affirmed. Currently, academic and industry supervisors are not well prepared for their roles. WIL is a powerful pedagogy, but there is potential to make it even more effective. The Australian Collaborative Education Network (ACEN, 2011), for example, has identified the lack of proficiency of academic and industry supervisors as one of the most serious deficiencies of WPL in Australia.

6.3 Managing partnerships

The skills and practices needed for collaborative work across universities and workplaces need to be developed through a combination of training and experience. There is a need for a high quality staff development programmes for academic and industry supervisors. Ideally, appropriate in-service training should be made available to both university teachers and workplace supervisors who are directly involved with WIL in order that different needs and understandings can be negotiated. The management of a university/workplace partnership can be described in terms of a number of phases:

6.3.1 Initiating partnerships

Partnerships are usually initiated by university teachers inviting senior members of the profession to provide input on a programme. In terms of what the university teacher requires from the workplace partner, it is important that there is clear articulation of intended outcomes for the collaboration, the scope of the partnership should be defined, and a needs assessment might be undertaken. In case study 31, the students are required to find their own internships for WPL, with support from their teachers:

Case Study 31: Finding internships in the IT profession

Description: All students enrolled in the Bachelor of Business Informatics course at the University of Canberra (UC) undertake a six credit point practical internship of 240 hours. Students find and arrange placements themselves in a way that mirrors a real-life search for employment. To assist students to find their internship, university teachers arrange an annual ‘IT in Business’ breakfast. Held toward the end of second semester in their second year, the breakfast brings together current and the following year’s

interns with potential employers. The lecturers in Business Informatics are very positive about the benefits of the internship for students, employers and the university: 'WIL is part of our outreach, consultancy, pedagogy and helping people learn'. University teachers see the internship as providing a range of learning experiences – sometimes at a very practical level. The internship provides students with an opportunity to realise that 'regular work days start before 10.30am and don't finish at lunch time on Friday'. For other students, important connections are made between theory and practice during an internship. Employers also see the benefits of providing internship places. As one employer commented, technical knowledge is only one important aspect of being an IT professional. In a range of generic skills, such as communication skills, problem solving, and the ability to work in a team, UC interns are 'very able – we love them to be able to communicate with human beings'.

HEQF (equivalent): Levels 7-8

Resources: The annual IT in Business breakfast, hosted by the university, as well as resources (e.g., telephone facilities) to enable students to follow up on contacts and appointments, etc. University teachers are also available for consultation, and assistance with placement.

Source: University of Canberra, 2010b.

6.3.2 Implementing partnerships

In some cases, particularly for PJBL and WPL, it will be necessary to formalise the partnerships (e.g. through MOUs). Whether this is done formally or informally, it is important to clarify the roles and responsibilities of the different partners. It is also useful to start with smaller projects and work placements, to learn from these, and to build on what was learned.

6.3.3 Maintaining partnerships

Once partnerships have been formed, it is important to keep them current. Many universities have developed operational plans and procedures in relation to partnerships. This could include the establishment and management of a database of partners. The partners should be sent up-dated information about the academic programme, and opportunities for their involvement. It is also useful for universities to consider capacity-building programs for partners to enhance the different WIL modalities. Where appropriate this could be done in the form of continuous professional development that is accredited by the relevant SETA or professional council. Communication is important in the maintenance of partnerships, such as letters of thanks for the partners' involvement and support, as well as providing information as required. It is also important for the university to recognise partners, either through issuing rewards or showing appreciation in other ways. It is important to consider the impact of the proposed WIL programme on the external partners. Many partners take their roles extremely seriously, committing significant resources to WIL students engaged in PJBL or WPL. It is often strategic to 'rotate' partners, and not to use the same partners every year.

6.3.4 Reflection and evaluation

It is important to request feedback from partners for the development of improvement plans for WIL. If possible, workplace partners should be included in informal debriefing sessions, as well as more formal programme evaluation.

CHAPTER SEVEN

MANAGING WORK-INTEGRATED LEARNING

7.1 Introduction to the management of work-integrated learning

The focus of this section is on the academic leadership and management in WIL. The focus is thus on the departmental level of WIL management. While the task of managing WIL will be largely done by university teachers, it is obviously much easier for university teachers, their heads of departments and heads of programmes, to manage WIL when there are clear institutional guides, policies and resources for WIL programmes. With regard to the administrative aspects of management, the Good practice guide and self evaluation instruments for managing the quality service learning (CHE, 2004), is a useful resource, in particular the 15 criteria for programme accreditation (2004: 21).

7.2 Managing work-integrated learning: the institutional level

Many universities have centralised support for WIL, through a WIL centre or unit, that provides both practical assistance (such as helping departments with work placements, finding appropriate workplace sites, or partners) and with assistance with the development of WIL curricula, pedagogy and assessment tasks. Many institutions have a WIL Senate Committee and a WIL policy to guide departments in their practice. The role of institutional WIL coordinators or directors is to:

- Develop WIL policies and/or guidelines;
- Set up structures for supporting WIL practices;
- Liaise, communicate and build relationships with workplace partners;
- Monitor WIL implementation;
- Analyse and interpret data on the implementation of WIL;
- Disseminate findings on WIL practices to relevant structures;
- Maintain WIL databases;
- Review and evaluate WIL initiatives.

Case study 32 shows how WIL was introduced at Flinders University in Australia, and how the necessary changes to the institutional culture were supported:

Case study 32: Managing WIL at the institutional level

Description: Flinders University's concern for integrating graduate employability into the curriculum has resulted in a university culture where the teaching of work-based skills and discipline-based learning complement and enhance each other. The strategies that underpin this cultural change have focused on

four key areas: 1) the development of intra-institutional partnerships between administration, faculty and service units to generate a university-wide climate for managing work placement programmes and support institutional change; 2) the creation of opportunities for students to acquire and develop work-related skills that complement and build on learning experiences; 3) a focus on staff development via a cross-institutional forum; and 4) the enhancement of university/industry collaborations with work-placement providers to achieve a learning-focused, stakeholder approach to forming partnerships with host organisations.

Cross-institutional WIL forum

A forum for professional and vocational education programmes was formed to utilise and build upon existing strengths and knowledge of individuals with regard to designing, managing, supervising, assessing and evaluating WIL. Additional public forums established shared responsibilities and knowledge building between academics, professional service providers and administrators on risk management and quality.

Cross-institutional WIL audit

A systematic, structured, interview-based audit of all practicum programmes run in conjunction with Flinders courses identified the scope and diversity of WIL at the University, as well as recording effective educational practices, concerns and risk management strategies.

Development of generic resources

The development of generic resources that could be adopted by, and adapted to, different disciplines to meet specific requirements was embarked upon. These included an on-line program for assisting students to become 'workplace literate' before their placement, and links to a Transferable Skills Portfolio innovation project.

Support and enhancement of the Careers and Industry Liaison Unit

New positions in the Careers and Industry Liaison Unit were created, including officers to collaborate with alumni for the provision of mentoring and leadership for current students.

Central administration policy review

Policy development and review ensured that the needs of students in work placements were accounted for, and that the work of academics in this arena was legitimised.

Intensified engagement with industry partners

The university consciously recognised the significant contributions of providers in public forums. The university offered industry providers appropriate university teaching.

The outcomes of the intentional shift in culture with regard to WIL included institution wide acceptance of WIL as a significant and valuable mode of learning in university education that involved approximately one-third of the Institution's students in any one year. The University committed to the enhancement of existing individual expertise in WIL, through research support, and overall capacity building for WIL. A professional development agenda was shared across the Institution, strengthening corporate and departmental partnerships for professional and vocational

courses with work readiness issues discussed at all levels of the system. There was also a broadening of the educational agenda of generalist courses to incorporate the development of work-based skills, e.g., WIL was included in new degree programs in science.

The enhanced relationships with many host organisations, including induction to supervisory roles and participation in Flinders' Foundations of University Teaching programme, helped to re-focus attention on students' learning outcomes. Policy changes accounted for the unique needs of WIL programmes and the work of those who coordinate and supervise them. An emerging new focus on the design of final-year topics (capstone topics) ensure that they: 1) promote meaningful connections between general education, the academic major, and career experience; 2) explicitly develop and synthesise important knowledge, skills and competencies; and 3) improve students' career preparation and postgraduate education prospects.

HEQF (equivalent): Levels 5-8

Resources: Extensive systems were developed and implemented, positions in the University's Careers and Industry Liaison Unit were funded, rewards and recognition for WIL teaching excellence were established, places for university training were made available to industry partners, and funds were committed to adequately resource all WIL programmes.

Source: Orrell, 2004.

7.3 Managing work-integrated learning: the departmental level

University teachers who implement WIL programmes are responsible for planning issues, and the level and nature of engagement, as well as the implementation issues of monitoring progress, assessing work and programme evaluation. As the management roles are different in the different curricular modalities, these are addressed separately:

7.3.1 Managing work-directed theoretical learning

Subjects that include professional and workplace issues, as with all university programmes, need to address issues of timetabling, the allocation of credits and/or duly performed requirements, the registration of students – ensuring that they are clear about the nature of the course or subject and its academic requirements, including the assessment tasks and criteria. A WDTL subject might include student preparation for an internship, or a workplace preparedness programme. Implementing a workplace preparedness programme usually requires collaboration with workplace partners, or other workplace representatives. There is thus a need for payment or honoraria for visiting professionals who might arrange site visits, give a guest lecture, assist with assessment, or help prepare students for work placement.

7.3.2 Managing problem-based learning

A full PBL curriculum demands considerable administrative and academic management. It is important for the academic manager to ensure that the logistics of managing PBL (which will require different timetabling, different venues, consultation times, workshop or laboratory space, etc) should not overshadow the academic programme. In the case of problem-oriented learning, university teachers will need to schedule meetings with workplace partners, or visits to workplaces – and on-going collaboration to ensure that authentic tasks and texts are included.

7.3.3 Managing project-based learning

PJBL learning involves considerable planning, as well as relationship building with workplace partners. Depending on the nature of the project, it may be advisable to formalise partnerships with workplaces (e.g., signing MOUs, clarifying roles and responsibilities of university teachers, workplace partners and students in study guides for the projects, address health and safety issues, etc.). The workplace may be involved with the selection of students, their orientation to the workplace in general as well as to the specific project, etc. It is important that full records are kept, including workplace and contact person details, student lists (which projects they are involved with, contact details, etc.). Data capturing and management of the database of students and workplace would probably be done by administrative staff, but should be overseen by the academic manager or university teacher who has the main responsibility for the project. PJBL involves liaising with workplaces; this might include attending meetings between students and their 'clients' (although this could be delegated to tutors or mentors). Students' progress on their projects should be monitored, regular feedback given, and their work should be formally assessed, usually in collaboration with workplace partners. Creating and managing authentic opportunities for projects in a real work context is a time consuming task and opportunities for student work placements might be limited in particular fields. As a result, PJBL is often simulated. It is possible to simulate the work environment at the university in order to enable students to experience some aspects of the workplace within an educational framework. Case study 33 reports on simulated PJBL:

Case study 33: Managing courtroom simulation and mock trials for evidence-based law

Description: Lecturers at the University of Canberra, most of whom had experience as legal practitioners in Australia's Northern Territory courtrooms were convinced of the value of situating the acquisition of essential knowledge of the rules of evidence in a practical mock trial framework. Pedagogically, this PJBL approach incorporated a cycle of theory acquisition, planning, doing and reflecting. A well-equipped operational courtroom was provided by the university, and proved to be an ideal environment for this learning to occur. The basis for the unit 'was not simply that evidence law is best understood in a practical context, but that "in-role" student engagement fosters a capacity for critique and challenge, as the complexities and shortcomings of the trial process are directly revealed'. Over a semester, students participate in a fictional trial as defence and prosecution lawyers and witnesses, providing 'a controlled approximation of evidence law in action', in which students focus on both the 'articulation of the rules of evidence and on the process of proof'. The lecturers were initially concerned that they might have been asking too much of students to require them to perform in a court before their peers, while at the same time rapidly mastering principle and process; but found that the students rose admirably to the challenge. As one of the lecturers explained, there were important ancillary benefits to students in that they were engaged as 'rational, ethical actors, aware of the importance of their own decisions to an emerging trial narrative'.

HEQF (equivalent): Levels 7-8

Resources: a courtroom for the mock-trial project; development of a PJBL curriculum for the full semester, the appointment of tutors and senior students to play roles such as witnesses, etc.

Source: University of Canberra, 2010b.

As can be seen from case study 33, the fact that a PJBL intervention is simulated, does not mean that it is not resource-intensive. Financial, human and physical resources were allocated to the project in order to enhance student learning and preparation for professional life in significant ways.

7.3.4 Managing workplace learning

In many universities, work placement officers, administrators, coordinators, or managers coordinate and organise work placement activity, including assessing workplaces for their suitability, liaising with workplace supervisors, visiting students while they are involved in work placement, arranging for assessment processes, and generally overseeing and supporting students in the workplaces. Placement officers should attempt to integrate, as appropriate, a range of student support mechanisms (e.g. mentors, counsellors) provided by the university as well as those provided by the workplaces. There is also a need to make available to WPL students the university's learning support systems, information and communication technology services, counselling services and other ancillary supports while they are on placement, as an integral part of the curriculum design. Thus a full range of services provided by the university and workplace (including the workplace's Occupational Health and Safety (OHS) services, safety and procedural inductions for new staff, psychological counselling services and staff development resources, resource centres, library support, etc) should be coordinated for the student on work placement. Effective administrators should keep placement records, maintain contact with students and workplace supervisors (and thank workplace partners for their support), assess and address risk and other matters such as OH&S and ethical issues related to placements. It is also an administrative function to establish minimum standards to ensure there is no risk of compromise to the placement (e.g., by OHS risk, illegality, sexual harassment and other forms of discrimination, or failure to comply with statutory standards, acts of commission or omission that would damage relationships with the workplace partners or to the University). The flowchart below, describes the process at Tshwane University of Technology for managing work placements:

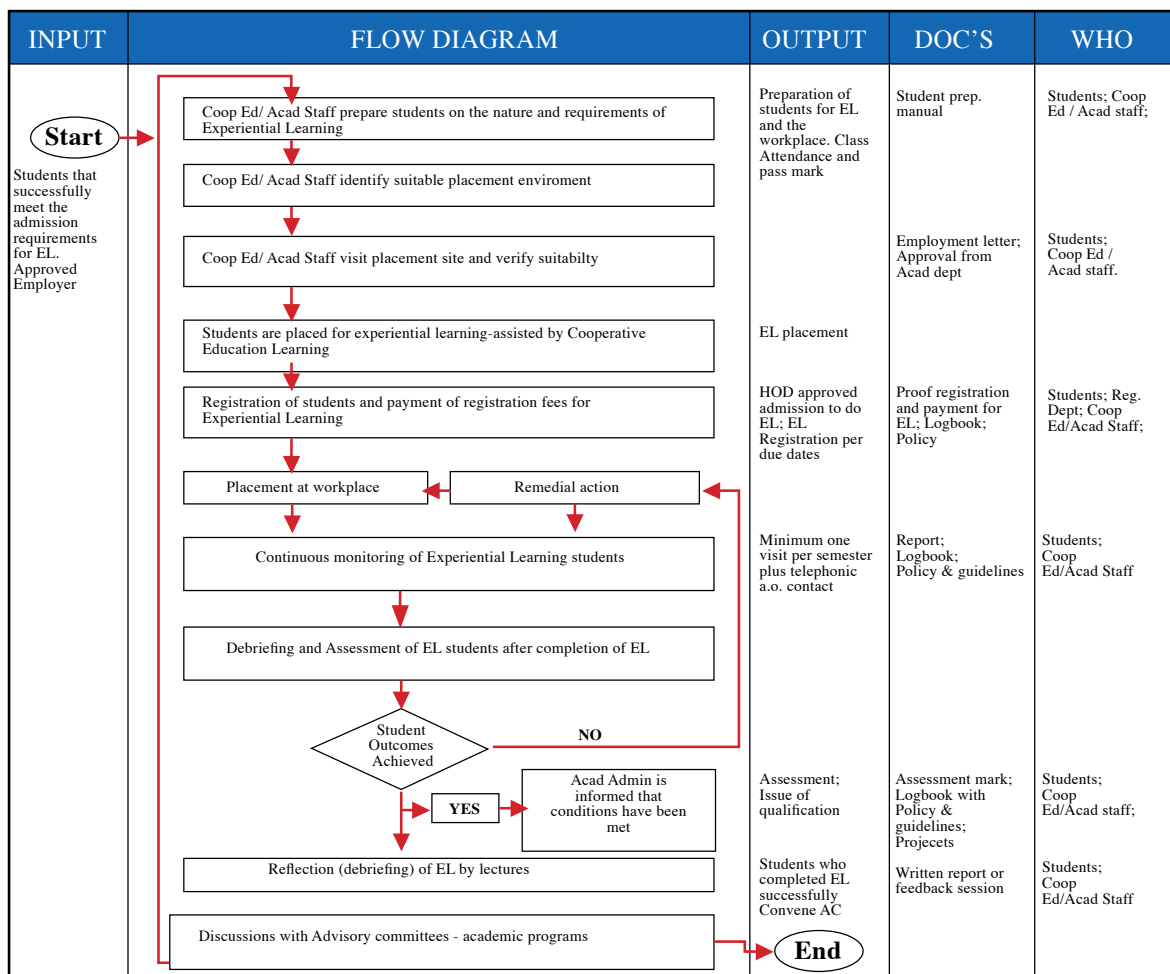


Figure 7.1: Quality management of WPL (from Wessels, 2005).

The process described in the flowchart above describes the stages in which ‘cooperative education’ staff (or work placement officers), work together with university teachers to place students appropriately. In terms of academic management, the role of the university teacher or academic manager (who might be the head of department or head of programme) is to:

- Integrate academic learning with work experience;
- Prepare students for the workplace;
- Assist with workplace mentoring (together with the administrative officer and workplace supervisor);
- Visit, or otherwise monitor students’ progress;
- Assess students’ achievements.

It is helpful for the academic manager to use a learning plan or learning contract to document negotiated agreements on learning outcomes and processes with students. The university teacher should take prime responsibility for coordinating with workplace supervisors and monitoring students’ workplace activities to ensure that they remain consistent with the intended programme outcomes and assessment criteria. It is important to build the assessment tasks around disciplinary knowledge and its transfer to the world of work, critical reflection on applicability of theoretical knowledge to practice; and self-reflection on the meaning and relevance of the experience and what was learned. The academic manager should monitor students’ progress during placement by communicating regularly with students and industry partners, visiting students and meeting with workplace supervisors at the workplace. This provides much needed support, especially for students who are experiencing difficulties as it addresses problems before they become a significant threat to their progress, success or safety and promotes a closer professional relationship with industry partners. Regular ‘debriefing’ meetings with students to discuss and share experiences can be used in place of workplace visits in cases where there are many students in many different work sites. Students should be required to keep reflective journals of their experiences and to submit three to four ‘milestone’ or progress reports for a one-semester placement duration.

7.4 Managing resources for work-integrated learning

The management of WIL includes the management of financial, human and physical resources. This is usually the task of the head of department, but should also involve the university teacher who is directly responsible for WIL in the programme or subject.

7.4.1 Financial resources

The university teacher, in consultation with WPL administration officers and the head of department or programme, should ensure that the departmental budget and resources are sufficient to cover the financial and logistical support necessary to implement the programme and to ensure the quality of the WIL curriculum, in particular its effectiveness for bringing about engagement and learning, students’ satisfaction with the experience, as well as a risk management strategy that anticipates likely contingencies and builds in administrative responses to possible eventualities. Financial resources are necessary for the payment of additional staff, the provision and maintenance of a WPL website, library resources for WIL, transport of staff to worksites, etc.

7.4.2 Staff resources

The international higher education benchmark for student to staff ratios when students are on work placement is 88:1; while in South African universities of technology (where work placement is common), the ratio is 234:1 (Wessels, 2005). This means that the quality of support for students in work placements is usually not adequate. For programmes with large numbers of students, a university teacher might be dedicated to coordinate the WPL, and have assistants to support the work, particularly if there are large numbers of students involved. There must be support staff to handle the correspondence, appointments, travel arrangements, and records. When WPL is newly introduced, there might be the need for the short-term appointment of consultants or experts to manage the programme, until suitable systems and procedures have been established.

7.4.3 Physical resources

The different curricular modalities require different physical resources. For WDTL existing university teaching spaces are probably adequate. Site visits are often required in WDTL, and arrangements for such site visits are necessary. PBL requires venues other than lecture halls to facilitate group work; if such resources are not available, this would affect the quality of learning, and a more problem-oriented approach might be taken in which lecture halls could be used for pair work, for example. PJBL similarly demands appropriate space for group meeting and group work on projects. It involves students making regular visits to workplaces or community sites, and then returning to the university to work on the project. This would tend to involve careful timetabling on the part of university teachers, with visits to workplaces planned well in advance of the project. WPL takes the students off the campus, but may require space for university teachers to meet regularly with them for the purposes of ‘debriefing’, monitoring progress, and dealing with problems.

Irrespective of the WIL curriculum modality, sufficient resources need to be made available to support university teachers and students to enable them to achieve the intended outcomes.

CHAPTER EIGHT

CONCLUSION

University teachers should be concerned to ensure that the students that graduate from their programmes are prepared for the world in which they will live and work. The integration of professional and academic concerns in the curriculum will go some way towards addressing this requirement. In South Africa, the re-curriculation processes required by the HEQF speak directly to this need. Keeping up with developments in the profession and workplace is a challenge for university teachers, as well as for graduates. Teachers and students need to be well informed about trends and issues that are practised outside the university, as well as inside it. University teachers should locate workplace issues in a wider context. To do so, they should compare the information about the workplace and about new curricular developments. University teachers should think carefully about the relationship between the workplace and the university. A university education is not about job training, and a WIL curriculum should not be dictated by economic or narrow workplace interests. Instead the university must be (as it always has been) responsive to society and responsive to the needs of students to become productive members of society. Beyond that, part of the mission of higher education has also been to look beyond immediate problems and to prepare students to change and improve existing practices, not merely to adapt to the world as they find it.

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GLOSSARY OF TERMS

Action learning: involves working on real problems, focusing on learning and implementing solutions. It is a form of learning by doing, pioneered by Professor Reg Revans of the University of Manchester. Action learning is a process of inquiry, beginning with the experience of not knowing ‘what to do next’, and finding that answers are not available through current expertise. When expertise fails to provide an answer, collaborative inquiry with fellow learners who are undergoing the same questioning experience is always available. To be effective, this partnership in learning needs to be both supportive and, at the same time, challenging, deeply caring yet questioning. Action Learning is common in business environments, and for business specific application the website <http://research.mbs.ac.uk/revans-academy/> has many resources for action learning.

Advisory Boards (or Committees): are essential infrastructure for a WIL curriculum that is built on the integration of the workplace and the university. This requires the collaboration of experts from both environments. Workplace advisors are critical to the success of the academy as they embody expert knowledge of the ‘real world’. The advisory board is expected to have the capacity to provide advice and opinions that will guide the academy to identify and design curricula to meet the learning outcomes for graduates in the profession. Advisory committees or similar groups also have the authority to render a decision or judgment on an issue. For example, an advisory committee to a university department may have the ability to contribute as external examiners, be a member on a staff appointment committee or collaborate on quality management.

Apprenticeship: is a system of training a new generation of practitioners, usually in a vocational field. In an apprenticeship model, most of the training is done while working for an employer who helps the apprentices learn their trade, in exchange for their continuing labour for an agreed period after they become skilled. Theoretical education may also be involved, informally via the workplace and/or by attending a college while still being paid by the employer. In South Africa the apprenticeship model has largely been replaced by ‘learnerships’.

Articles: an articled clerk is an apprentice in a professional firm, generally in the accountancy or legal professions. The articled clerk signs a contract, known as ‘articles of clerkship’, committing to a fixed period of employment. The other party to the contract, the principal, undertakes during this period to provide training and relevant experience in the practice. Nowadays some professions prefer to call their

apprentices 'students' or 'trainees' (e.g., a trainee solicitor) and the articles of clerkship 'training contracts'.

Capstone course: is the culminating class of a course of study, usually taken in the final year of study. It is generally a class where a student demonstrates all that has been learned in his or her major, usually by writing a major paper and presenting it before an academic panel, doing a major project, engaging in a research project, or doing an internship of some kind. It can be a class of from 3 to up to 12 credit hours.

Clinical Educator: within a traditional work placement or internship provides discipline specific expertise with the goal of meeting the professional competency requirement of the programme. Other terms that are similar include: preceptor, clinical instructor, clinical supervisor, clinical tutor, mentor, clinical faculty.

Cooperative education: was the term used by the ex-technikons to describe the placement of students in appropriate workplaces for the purpose of gaining work experience in their chosen fields or disciplines, with the cooperation of potential employers. Cooperative Education is a specific international movement with its own particular approaches (see the World Association of Cooperative Education website: <http://www.waceinc.org/>).

Experiential learning: (in South Africa sometimes used synonymously with Cooperative Education) is a term used with a great variety of meanings in the international literature. More broadly it may refer to learning that has meaningful learner involvement. It is the process of making meaning from direct experience. Experiential learning is learning through reflection on doing, which is often contrasted with rote or didactic learning. Experiential learning is related to, but not synonymous with, experiential education, action learning, adventure learning, free choice learning, cooperative learning, and service learning. While there are relationships and connections between all these theories of education, importantly they are also separate terms with separate meanings. Experiential learning focuses on the learning process for the individual (unlike experiential education, which focuses on the transactive process between teacher and learner). Resources for EL can be found at:

<http://njaes.rutgers.edu/learnbydoing/weblinks.html>

Fieldwork: covers work that is done outside of the normal place of 'work'. In the case of students on a professional programme at a university this would be work undertaken outside the academy in order to gain knowledge through direct contact and observation. This is likely to be in a real world situation and for professional development but a programme may include fieldwork beyond the confines of the professional competencies, for example research, service learning etc.

Graduateness: covers the generic qualities that might be expected of any graduate. An early example of usage is from the British Higher Education Quality Committee Interim Report published in December 1995: 'The most promising approach to establishing shared, explicit standards seems to lie in exploring the generic qualities that might be expected of any graduate'. More information about graduateness and graduate attributes is available at:

http://www.heacademy.ac.uk/assets/york/documents/resources/heca/heca_ks11.pdf

Inquiry learning: is an approach that provides students with opportunities to develop skills that enable them to locate, gather, analyse, critique and apply information in a wide range of contexts as they develop

understanding. Inquiry learning is suitable at school and university level. A wide range of resources for inquiry learning can be found at the website: <http://ictnz.com/Inquiry%20Learning.htm>

Inter-professional learning: is a term mainly used in health and medical education as a learning strategy to improve the quality of patient care. It focuses on the needs of service users and carers and encourages professions to learn with, from and about each other, to respect the integrity and contribution of each profession and to enhance practice within professions. Resources for inter-professional learning can be found at: <http://www.faculty.londondeanery.ac.uk/e-learning/interprofessional-education/principles-of-interprofessional-learning>

Internship: is a term used where a student or a recent graduate is undergoing supervised clinical/practical education/training. An intern is the term typically used for recent medical school graduates who are learning medical practice in a hospital under supervision, prior to beginning a residency program.

Learnership: is a means of obtaining a qualification while working. There are two ways in which learnerships function: 1) an employer may decide to run a learnership, or 2) a training service provider will run a learnership and assist students in finding placement at a workplace. Companies form a relationship with a training service provider, for example an FET college, and the trainer either comes to the workplace (if there are enough learners), or the learners attend a training program run by the training provider. A learnership is a training programme that combines theory at a college or training centre with relevant practice on-the-job. There is no learnership if there is no on-the-job practice. The idea is that people really learn the 'ins and outs' of an occupation by practising all its aspects under the guidance of an experienced and qualified person. In order to become qualified themselves, learners will have to be assessed against occupational standards that have been agreed in advance by industry stakeholders. Learnerships are based on legally binding agreements between an employer, a learner and a training provider. This agreement is intended to spell out the tasks and duties of the employer, the learner and the training provider. It is designed to ensure the quality of the training and to protect the interests of each party.

Knowledge work: relates to a number of issues. Knowledge-based and service industries are becoming major contributors to national economies. The move towards knowledge-based economies has changed what counts as knowledge and knowing in societies. The emphasis on knowledge has shifted from a theoretical to applied and problem-based knowledge. The increasing economic struggle to maintain competitiveness has contributed to this change. Knowledge possessed by students resides within them in either tacit or explicit forms. Achieving applied and problem-based knowledge of real world situations requires students to link their tacit knowledge acquired through academic programmes with explicit knowledge. Knowledge work focuses on enabling a shift from the training perspective of the organisation to the learning perspective of the individual. Kelloway and Barling (2000) delineate four types of knowledge work: 1) creation of new knowledge or innovation; 2) the application of existing knowledge to current problems; 3) the packaging or teaching of knowledge; and 4) the acquisition of existing knowledge through research or learning. Typical knowledge workers may include engineers, analysts, consultants, researchers and the like. What is key, is that a person conducting knowledge work is likely to engage in all these activities intermittently and thereby dynamically switch to different roles in the context of their work. It is these different roles that a knowledge worker typically employs which is supported by the work-integrated learning approach.

Observed Structured Clinical Examination (OSCE): is a type of assessment widely used in Health

Science education that incorporates the use of simulated scenarios and standardized patients for the assessment of clinical competence. The OSCE consists of a series of brief, structured encounters (stations) that are identical for each participant/student. Typically each station assesses a single clinical competence. A well designed OSCE allows simultaneous, direct and reliable assessment of clinical performance for a large number of students.

Policy on Work-integrated Learning: guides WIL. The policy developed by the University of Canberra is useful because of its broad definition of WIL.

The document is available at: https://guard.canberra.edu.au/policy/policy.php?pol_id=3226

Practicum: is a period of work that provides the student with the opportunity for practical experience in the real world as part of an academic programme.

Problem-based learning: (PBL) is a term used within higher education for a range of pedagogic approaches that encourage students to learn through the structured exploration of a research or practice-based problem (Savin-Baden and Major 2004). In PBL, students work in small self-directed groups to define, carry out and reflect upon a task, which is usually related to, or based on, a 'real-life' problem. An inter-disciplinary team designs carefully structured and sequenced 'problems' that will direct the students' learning towards the determined outcomes and objectives of the curriculum. The lecturer acts as a curriculum coordinator and ensures that students have access to a variety of resources for information gathering. The lecturer must also be able to guide and advise students. Facilitators are appointed for each small group. This person is not necessarily an expert in the discipline but is a good learning facilitator, skilled in group dynamics and able to direct students to persons/resources that will advise and guide them. PBL began in the Health Sciences, but has since been used in a variety of disciplines and teaching situations, both within one course units and to deliver a whole degree curriculum, and with undergraduates as well as postgraduates. The focus of the reform in the Health Sciences in the South African context was on a learning environment that incorporates elements of PBL. The intention has been to prepare practitioners for national and global changes in health care, promote the primary health care approach, and provide a solution to the shortage of health care professionals in rural South Africa and to develop respect and understanding of the interdisciplinary health care team (South African Association of Health Educationalists, 2003). There are many available resources for PBL; as a starting point university teachers could explore the website:

http://pbl.cqu.edu.au/content/online_resources.htm

Professional: traditionally means a person who has obtained a graduate qualification in a professional field and whose practice is regulated by the requirement of registration with a legislated professional body. The term professional is now used more generally to describe highly educated experts with specialized knowledge and competence in a specific field. They enjoy considerable responsibility and autonomy, a comfortable salary, are engaged in intellectually challenging work and build professional knowledge through research. Professionals must adhere to high standards of professional ethics and moral codes and must place the interests of the client above all else.

Professional education: refers to the education of professionals in areas such as the law, medicine, teaching, etc. Such education usually takes place at a university.

Professional technical education: (PTE) is a programme of study that integrates technical and career proficiencies with academic content; and prepares students for the workplace, further education, training and family and community roles. PTE integrates academics with vocational and technical education through a coherent sequence of courses to ensure learning in the core academic and vocational and technical subjects, provides students with strong experience in and understanding of all aspects of an industry and is of such size, scope, and quality to bring about improvement in the quality of vocational and technical programs.

Project-based learning: (PJBL) combines PBL and workplace learning (see below) in that it brings together intellectual inquiry, real-world problems, and student engagement in relevant and meaningful work. Project work is generally understood to facilitate students' understanding of essential concepts and practical skills. Well-crafted projects should engage students, provide a meaningful and authentic context for learning and immerse students in complex, real-world problems that do not have a predetermined solution. Good practice in PJBL requires students to develop and demonstrate essential skills and knowledge and to draw on multiple disciplines to solve problems and deepen their conceptual understanding. PJBL needs to build in opportunities for reflection and self-assessment, and can result in useful products or services that also demonstrate what students have learned. Service Learning (see below) can be understood as a special form of PJBL that connects students with communities, service partners, and academic experts. SL has been recognised for its ability to foster transferable skills because it is an approach that allows students to take the lead and make critical choices and decisions. A key issue to be addressed is how to ensure that students are adequately trained on site, and how to ensure that they are able to integrate experiences across areas of learning – both internal and external to academic knowledge production systems. A useful PJBL site (for high school and college level) is <http://www.edutopia.org/project-based-learning>. Projects at higher university levels tend to be reported on in the educational journals.

Sandwich course: is so named to describe the alternation of study periods at university with training periods in industry or professional practice. A common arrangement is six months at university followed by two to three months in a training situation for the first three years of a course, with a final fourth year at university, but a variety of periods and sequences exists. The term 'sandwich' is in general use in Britain though a few prefer the name 'integrated course', whilst in America the accepted terminology is 'cooperative course'. Some courses are taken part-time in blocks of concentrated study time surrounding a period of practical or work-related experience. This could mean studying for a block of a few days each month, or for a block of a few weeks during a year, or perhaps for a whole term. Sandwich degree courses are usually courses which include an extra year of work experience (or language training) 'sandwiched' between two or three years of concentrated study. During the extra year, the student usually goes on work experience with an employer, organisation or department in their subject field.

Sandwich programme: is used to denote a higher education curriculum containing a work placement that is integral to the achievement of the intended learning outcomes for the programme. Thick sandwich programmes contain a year long work placement normally in the third year of a four year programme. Thin sandwich programmes contain one, or sometimes two, shorter (typically 6 months or semester (12 to 15 weeks) work placements). In sandwich programmes the experience of working and learning in the work place enables the learner to develop in ways that are consistent with the programme aims and intended learning outcomes.

Scenario learning: is the use of a pedagogical or learning scenario in the teaching and learning activity

of a given subject or integrating subjects through the given situation (scenario). It generally involves a workplace example incorporated into the learning environment of the academy.

Service learning: is a structured learning experience that combines community service with preparation and reflection. Students engaged in service-learning provide community service in response to community-identified concerns and learn about the context in which service is provided, the connection between their service and their academic coursework, and their roles as citizens. The US ‘Campus Compact’ website has extensive resources to support service-learning: <http://www.compact.org/>

Simulated learning: is learning stimulated through an activity that involves the imitation of the real world in the academy. The act of simulating something entails representing certain key characteristics of the selected workplace and includes such things as laboratories, patient models, mock meetings, flight simulations etc. The SIMPLE project has guidelines for simulated learning on the UK-based Higher Education Academy website: <http://www.ukcle.ac.uk/projects/past-projects/tle/>

Site visit: is a visit in an official capacity as an academic staff member to evaluate a site to determine its suitability for student learning or as a student to observe, experience and learn from being ‘on-site’.

Team based learning: (TBL) has two distinct usages. It was first popularised by Larry Michaelsen, the central figure in the development of the TBL method while at University of Oklahoma, to describe an educational strategy that he developed for use in academic settings. The second usage describes a process for teaching and developing people in the workplace. The main features of the team-based learning approach are the following: 1) long-term groups of 5-7 students with diverse skill sets and backgrounds; 2) individual accountability for out-of-class work; 3) incentives for working effectively together as a team by giving significant credit (course points) for team activities, and 4) application exercises that are significant (correlated to important course objectives) and meaningful to the future work that the course might prepare a student for. Resources for TBL can be found at: <http://www.teambasedlearning.org/>

Ubiquitous learning: (or u-learning) is equivalent to mobile learning, in that learning environments can be accessed in various contexts and situations. The ubiquitous learning environment (ULE) may use more context awareness to provide adaptive content for students. A ULE is any setting in which students can become totally immersed in the learning process. So, a ULE is a situation or setting of pervasive or omnipresent education or learning. Education is happening all around the student but the student may not even be conscious of the learning process. Source data is present in the embedded objects and students do not have to do anything in order to learn. They just have to be there. U-learning is the subject of a research institute at the University of Illinois, Urbana/Champaign, that has a website with resources: <http://education.illinois.edu/uli/>

Virtual learning environment: (VLE) is a set of teaching and learning tools designed to enhance a student’s learning experience by including computers and the internet in the learning process. The principal components of VLE include curriculum mapping (breaking the curriculum into sections that can be assigned and assessed), student tracking, on-line support for both university teachers and students, electronic communication (e-mail, threaded discussions, chat, Web publishing), and internet links to outside curriculum resources. In general, VLE users are assigned either a teacher ID or a student ID. The teacher

sees what a student sees, but the teacher has additional user rights to create or modify curriculum content and track student performance. There are a number of commercial VLE software packages available, including Blackboard, WebCT, Lotus LearningSpace, and COSE. The terms virtual learning environment (VLE) and managed learning environment (MLE) are often interchanged. Resources for VLEs are available at many internet sites. A starting place might be: http://whatis.techtarget.com/definition/0,,sid9_gci866691,00.html

Vocational education: or vocational education and training (known as VET in the UK and Australia, and as Further Education and Training or (FET) in South Africa) prepares learners for jobs that are based on practical activities, related to a specific trade, occupation, or vocation. It is sometimes referred to as ‘technical education’ as the trainee directly develops expertise in a particular group of techniques. Vocational education may be classified as teaching procedural knowledge. This can be contrasted with declarative knowledge, as used in education in broader scientific fields, which might concentrate on theory and abstract conceptual knowledge, characteristic of tertiary education. Vocational education can be at the secondary or post-secondary level. Up until the end of the twentieth century, vocational education focused on specific trades such as, for example, those of automobile mechanic or welder. Historical educational polarisations about the different natures and hierarchical values of general education vs. vocational vs. liberal education have been the heart at the separation of theory and practice in the history of vocational education. In colloquial usage, the term ‘vocation education’ is used to refer to career-focused education.

Work-based learning: (WBL) has been defined as ‘learning for, at, or through work’ (Brennan and Little, 1996). WBL involves the acquisition of work-related knowledge and skills both in the university and in the workplace, with the formal or non-formal involvement of employers (Boud and Solomon 2001). In work-based learning the focus is typically on the workplace itself and what students are doing there. This forms the basis for the curriculum. The curriculum is thus quite unlike a typical university course because the ‘what’ and ‘how’ of learning at work and university are substantially different (Boud, Solomon and Symes, 2001: 4-5). The nature of most WBL curricula can be summed up thus:

Work-based learning has come to be used as a description of accredited university courses in which a significant proportion of study, if not all, is undertaken in the workplace, whose issues and challenges form the major focus of study (Boud and Symes, 2000: 14).

In designing such curricula the first step is the establishment of outcomes which meet something of the needs of both work practice and those of the university. These are typically a mix of the kind of higher order cognitive skills, such as reflection and critical thinking, required in university courses and more content and context specific work outcomes. Assessment is generally performed by the university as it is the accrediting body. Criticism of WBL is often associated with the dominance of work knowledge and practice, which may reflect short-term economic goals, rather than student learning deemed appropriate by the university. To some extent university knowledge may be seen to be reduced to a few skills and thus generally underrepresented. A further related criticism, from an activity theory perspective, is that students are not necessarily bringing in different and often new knowledge garnered in university study. Opportunities for developmental transfer may therefore be limited. WBL may take different forms but would generally involve some measure of individual curriculum tailoring to particular types of workplace and its associated learning.

Work-directed theoretical learning: (WDTL) involves an attempt to ensure that theoretical forms of knowledge (such as mathematics and physics in engineering programmes) are introduced and sequenced in ways that meet both academic criteria and are applicable and relevant to the career-specific components (Barnett, 2006). An example would be a subject called ‘Mathematical Foundations of Engineering’ in contrast to the more traditional ‘Mathematics I’.

Work-integrated learning: WIL refers to an educational approach that aligns academic and workplace practices for the mutual benefit of students and workplaces. For one of the clearest definitions the University of Canberra’s WIL website is very useful: <http://www.canberra.edu.au/wil/what>

Workplace learning: is considered to be a valid learning experience for students in many higher education programmes. Most professional training programmes include a practicum, which can vary from a few weeks to a few years of practical experience at a site of professional practice. This model can be strongly or weakly integrated into the formal learning programme, depending on how it is supported, supervised, and assessed. In such programmes, the workplace is present, both as a learning resource and as a benchmark of practice. Much of the training of health professionals takes place at the site of practice, traditionally a large general state hospital. In this model, a satellite university campus is established in a host institution and a transdisciplinary construct known as ‘teaching or academic hospital’ is created. This brings elements of the learning environment (lecture halls, tutorial rooms, libraries, demonstrations, etc.) into the daily activities and practices of the hospital as a workplace. Students, as early as the first year, are brought into the workplace, and are simultaneously acculturated into academic and workplace knowledge systems. More recently the clinical learning environment of Health Science students has expanded to include the full range of the health care services. The principles however remain the same, as primary health care facilities, regional hospitals and private health care units take on the transdisciplinary identity of integrated workplace learning. Many other career-focused higher education programmes include some form of WPL, in the form of industrial placements, job-shadowing, professional practice to support a professional qualification, and employer- or employment-based schemes, such as learnerships. In order to be accredited within a qualification, such learning would need to be measured and assessed against specified learning outcomes and assessment criteria. Examples of such learning already taking place in many university programmes include traditional ‘sandwich’ courses, specific skills training in particular professions, and the theoretical application of practical experience in part-time professional courses. There are a number of resources, templates, model MoUs, etc. available in Experiential Learning (Wessels, 2005).

Work placement: is a way of gaining ‘on the job’ experience in the real world and is part of the curriculum design for WIL for professional qualifications. The aim of a work placement is to develop the student as a professional through observation, participation and completion of tasks that demonstrate competency.

ACRONYMS

AC	Advisory Committee
ACE	Advanced Certificate in Education
ACEN	Australian Collaborative Education Network
a.o.	and other
CCFO	Critical cross field outcomes
CESM	Classification of Education Subject Matter
CHE	Council on Higher Education
Coop Ed/Acad staff	Cooperative Education/Academic Staff
CV	Curriculum Vitae
DITSELA	University of Cape Town's Trade Union Educator's Diploma
DP	Duly Performed (certificate)
EL	Experiential Learning
EMS	Engineering Material Science
HAN	Hogeschool van Arnhem and Nijmegen
HEQC	Higher Education Qualifications Framework
HEQF	Higher Education Qualifications Framework
HR	Human Resource
ICT	Information and Communication Technology
IT	Information Technology
IT	Integrated Task
ITL	Improving teaching and learning
MOU	Memorandum of Understanding
OHS	Occupational health and safety
PBL	Problem Based Learning
PJBL	Project Based Learning
R&D	Research and Development
RMIT	Royal Melbourne Institute of Technology
RPL	Recognition of prior learning
SETA	Sector Education and Training Authority
SL	Service Learning
UC	University of Canberra
WDTL	Word-directed theoretical training
WIL	Work-Integrated Learning
WPL	Work Place Learning

NOTES

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This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



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