

# A Workplace Literacy Perspective on Unlocking Employability of Technical and Vocational Education and Training College Graduates

by

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## ABSTRACT

The inability of young graduates emerging from education and training institutions, including technical and vocational education and training (TVET) colleges, to find employment or socially useful work, constitutes a challenge to economies worldwide. A contributing factor to this crisis is these graduates' lack of employability attributes. In this study, modern-day workplaces and the demands of work were explored from a workplace literacy perspective to conceptualise workplace literacy and the development thereof.

Literacy is circumscribed in the context of the workplace, and its development at TVET colleges is conceptualised in an ideological perspective as evolving identity and behaviour. Becoming workplace literate means recognising the value and purpose of literacy practice in different workplace-related contexts, and integrating and applying literacy practices functionally so as to establish a literate identity. This identity includes capabilities to use and produce multi-modal texts. Ultimately, such a workplace literate identity manifests as creative and critical literacy behaviour, which transforms the individual as a thinking and working being and enhances employability. The resulting conceptual frameworks that result from the review of literature on the topic, served as basis for the content analysis of a TVET college curriculum from which, in turn, possible measures have been developed to prepare and make TVET college graduates a better fit for the world of work.

To validate the conceptual frameworks, a directed content analysis was conducted of the affordances provided for workplace literacy development in the intended curriculum of the Engineering and Related Design programme. The analysis traced these affordances in terms of the aspects and elements of the developmental layers of workplace literacy as described in the conceptual framework. A comparison was drawn between the number and type of affordances provided in the curriculum documents of the fundamental and core subjects of this programme. It was found that there are ample affordances to develop workplace literacy at functional level, especially capability with academic literacy practices. However, there are minimal affordances to master capabilities in terms of using literacy critically and creatively for purposes of development and transformation so as to prepare for transition to the workplace.

From the conceptualisation of workplace literacy and the development thereof and the content analysis, a number of implications were derived for creating literacy-rich and enabled environments in TVET colleges. These are spelled out as practice turns for classroom practice and practitioner, as well as possible measures for college life and culture and TVET policy. A simplified instrument was attempted to guide the evaluation of the curriculum and the development of workplace literacy practices in terms of affordances for developing workplace literacy readiness.

The research contributes to the ideological understanding of workplace literacy in a TVET college context. Workplace literacy means more than reading and writing in a workplace and being employable by virtue of being

literate. It includes capability with other coding systems and functionally applying literacy practices within technological work environments. Developing such a literate identity has the potential to transform an individual's life and work practices. Although quick solutions to TVET college graduate unemployment and employability are not proposed, being able to do work as conceptualised in an array of workplace contexts cannot but enhance employability.

## ABSTRAK

Een van die kritiese uitdagings wat gegradueerdes van opleidingsinstansies soos tegniese en beroepskolleges voor te staan kom, is om werk en betekenisvolle werk daarby te vind. Een van die bydraende faktore tot hierdie ekonomiese krisis wêreldwyd is die werksgereedheid van sulke gegradueerdes. In hierdie studie is daar gekyk na die moderne werksplek en die uitdagings van werk vanuit 'n werksplek geletterdheid perspektief om werksplek geletterdheid en die ontwikkeling daarvan te konseptualiseer.

Geletterdheid word gedefinieer in die konteks van die werksplek en die ontwikkeling daarvan word konseptualiseer in 'n ideologiese perspektief as 'n spesifieke identiteit en gedrag. Werksplek geletterdheid beteken om die waarde en doel van geletterdheidspraktyke in 'n verskeidenheid van werksplek kontekste te verstaan en om hierdie geletterdheidspraktyke te integreer en toe te pas om 'n werksplek identiteit in terme van geletterdheid te vestig. Hierdie identiteit sluit die gebruik en skep van multi-modale tekste in. Ten einde manifesteer hierdie identiteit as kreatiewe en kritiese geletterdheidsgedrag wat die individu as 'n denkende en werkende wese transformeer en werksgereedheid bevorder. Die konseptuele raamwerke in dié verband dien as basis vir die inhoudsanalise van 'n kollege kurrikulum en daaropvolgend vir die voorgestelde implikasies om tegniese en beroepskollege gegradueerdes voor te berei vir die werksplek.

Om die konseptuele raamwerke te valideer is 'n direkte inhoudsanalise gedoen in terme van die geleentede vir werksplek geletterdheid ontwikkeling in die voorgestelde kurrikulum vir die opleidingsprogram 'Engineering and Related Design'. Die analise het behels om hierdie geleentede te identifiseer in terme van die elemente van die werksplek geletterdheid soos gekonseptualiseer. 'n Vergelyking is ook getref tussen die aantal en tipe geleentede wat in die kurrikulum dokumente van die fundamentele en kernvakke gevind is. Die analise het getoon dat daar vele geleentede is om funksionele geletterheidsvaardighede, spesifiek vir akademiese geletterdheid, te ontwikkel. Aan die ander kant is geleentede om kritiese en kreatiewe geletterdheid vir ontwikkeling en transformasie van geletterdheidspraktyke te bemeester minimaal. Hierdie vaardighede is krities vir die oorgang na die werksplek.

Die konseptuele raamwerk en inhoudsanalise dien as basis vir 'n aantal implikasies om geletterdheidsryke en bemagtigde omgewings in tegniese en beroepskolleges te vestig. Die implikasies word uitgespel as wysigings in praktyk in terme van die klaskamer en die praktisyn, asook moontlike aanpassings van kollege-lewe en -kultuur en tegniese en beroepskollege-beleid. 'n Vereenvoudigde instrument is ontwikkel om die kurrikulum en ontwikkeling van werksplek geletterdheid praktyke te evalueer in terme van die geleentede vir ontwikkeling van werksplekgereedheid.

Die navorsing maak 'n bydrae in terme van die ideologiese begrip en verstaan van werksplek geletterdheid in die konteks van tegniese en beroepskolleges. Werksplek geletterdheid is meer as lees en skryf in 'n werksplek

en om werksgered te wees in terme van geletterdheid. Dit sluit ook vaardighede met ander kodeersisteme in, asook om effektief en produktief te funksioneer in tegnologiese werksomgewings. So 'n werksplek geletterdheid identiteit het die potensiaal om die individu en werkspraktyke te transformeer. Alhoewel vinnige oplossings vir kollege gegraduateerdes in terme van werkloosheid en werksgeredheid nie voorgestel word nie, kan die vermoë om te werk soos gekonsepsualiseer in verskeie werksplek kontekste nie anders as om gereedheid vir werk en indiensneming van gegraduateerdes te bevorder nie.

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**ABBREVIATIONS AND ACRONYMS**

AET	Applied Engineering Technology
CAM	Computer-Aided Machining
DHET	Department of Higher Education and Training
EFA	Education for All
EFAL	English First Additional Language
EP	Engineering Processes
FET	Further Education and Training
GRALE	Global Report on Adult Learning and Education
IALS	International Adult Literacy Survey
ICASS	Internal Continuous Assessment
ICT	Information and Communication Technology
ICWLA	Inner-City Workplace Literacy Arc
LO	Life Orientation
Math	Mathematics
NATED	National Technical Education
NCV	National Certificate (Vocational)
NEET	Not in employment, education or training
NQF	National Qualifications Framework
NSDS	National Skills Development Strategy
OECD	Organisation for Economic Co-operation and Development
PEP	Professional Engineering Practice
PSET	Post-school Education and Training
SETA	Sector Education & Training Authority
TVET	Technical and Vocational Education and Training
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VET	Vocational Education and Training

## CHAPTER 1: INTRODUCTION AND ORIENTATION TO THE RESEARCH

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## 1.1 Introduction

This research introduces a conceptualisation of workplace literacy in an ideological perspective and aims to guide such literacy development in graduates of technical and vocational education and training (TVET) colleges in South Africa. Furthermore, workplace literacy development is regarded in light of broader employability skills, inclusive of aspects of literacy such as communication and linguistic capabilities, higher-order thinking and working with technology. Working with technology specifically refers to using computer software applications in literacy practices, such as reading and viewing, writing, listening and calculating.

Employability and employment readiness, specifically of the youth, are globally contentious discourses. In the South African context, as is the case globally, workplaces are experiencing the consequences of a mismatch between the education and training supply and the realities of the workplace and world economy (Rojewski, 2009). Growing skills shortages and the failure of post-school education and training (PSET) institutions to address priority skills shortages, as well as a deteriorating level of productivity and stagnant (if not deteriorating) national economic growth rate, contribute to a bleak future for youth employment (Allais & Nathan, 2012).

The problem of youth unemployment in South Africa is exacerbated by the fact that the majority of students emerge from the schooling system with weak literacy and numeracy skills and enter the college system with weak foundational learning competences (Cloete, 2009). Upon graduation, these students are at risk of becoming part of the cohort of youth that is neither in employment nor in education or training – commonly referred to as the ‘NEET’ (Field, Musset & Alvarez-Galvan, 2014; Perold, Cloete & Papier, 2012). Research (Green & Riddell, 2001; Smits, 2007; Thorn, 2009) has shown that individuals with stronger literacy and numeracy competences are less likely to be unemployed, have higher earnings and better prospects for further learning. Therefore, global organisations such as the Organisation for Economic Co-operation and Development (OECD) and the McKinsey Global Institute recommend mechanisms to address weak foundational competences among college entrants as solutions to poor youth employment rates (Field et al., 2014:119). Such mechanisms include improvement of the quality of language, mathematics and science education, as well as the development of essential employability skills such as communication and other workplace behaviour (Leke et al., 2015:20).

Changes in the workplace environment globally further complicate matters of employment and employability. As Chinien (2003) and Hilton (2008) explain, there is a shift from a manufacturing economy to service, information and knowledge economies, which demand reengineering or restructuring of the workplace to meet the demands for higher productivity and quality. The arrival of new technologies, together with a culture of accelerated change in the work- and marketplace, also demands advanced and sophisticated skillsets from the employee or job-seeker (Johnson, 2009). The preceding arguments thus position literacy development as an integral factor to be considered in the discourse about college graduate employability. This research therefore

critically reflects on these workplace factors from a literacy development perspective, as well as the role TVET colleges have to play with regard to preparing graduates who will emerge from these institutions to compete for limited employment opportunities.

In terms of my own positionality as the researcher – I am currently employed at the Department of Higher Education and Training (DHET) within the branch that steers and administers TVET colleges. This positionality, however, necessarily results in some insider knowledge and bias towards implications for TVET college practice from a Departmental perspective. The poor performance in terms of college students' academic success and work readiness sparked my interest regarding a contribution in this regard.

Moreover, as a qualified language teacher, my focus has always been to critically reflect on the development of linguistic proficiency and how to use language and literacy functionally and intelligently in one's life. As such, I am involved in the development of a foundational learning programme for college student entrants. This project resulted in conceptualising language usage and literacy as more than proficiency and technical competence and to insert a sense of what-it-might-mean-to-be-workplace-literate in such a programme.

In light of the conceptual nature of this research, Chapter 1 has not been structured in a traditional manner. It commences with an overview of and background to the TVET college sector, as well as the employability challenges faced by colleges and graduates, to frame the argument presented. The modern-day workplace, emerging work environments and requirements for work are next explored in light of literacy development. After posing the research questions and defining the key terms, the research design and methodology are explained. The conceptual frameworks in Chapter 2 result from a content analysis of literature on literacy and the developmental conceptualisation is used for the summative content analysis in Chapter 3. The findings and interpretation of the analysis are recorded in Chapter 3. The implications of the analysis and contribution of the research are elaborated on in Chapter 4.

The next section provides an overview of the background and history of TVET colleges and why this research is aimed at making a contribution for this particular sector and its graduates.

## **1.2 Background**

In this section, a brief history is provided as to how TVET colleges came to be and the kind of challenges graduates face.

### **1.2.1 Brief overview of background and history of TVET colleges**

Throughout most of the 20th century, the South African college sector played a central role in training white workers for artisanal labour in the racially segregated apartheid economy. Originally started as technical

institutes to service the mines and manufacturing plants that emerged around Johannesburg in the early 1900s, these institutions grew in number and size and became known as technical colleges after 1923 (Kraak & Perold, 2003). By 1994 the technical college system, consisting of 152 colleges in total, was a complex mix of historically-white institutions with considerable autonomy, historically-black urban colleges with far less autonomy, ex-homeland colleges and lower-level training centres (McGrath, 2004b).

This sector has been subjected to major policy changes and legislative amendments in the last two decades which, Kraak (2014:42–46) elaborates, contributed to defining and amending the institutional landscape from 152 smaller technical colleges to 50 mega-institutions for the provision of technical and vocational education and training. Two of the major policies and legislation that played a role in this regard are the New Institutional Landscape Policy of 2001 and the Further Education and Training (FET) Colleges Act of 2006. The merger of the technical colleges into 50 FET colleges was effected in line with the vision for further education and training as expressed in the New Institutional Landscape policy. The FET Act was passed in 2006 with a strong focus on creating a modern, vibrant college system that is built on a foundation of lifelong learning and that is responsive to the needs of the 21st century.

The third key component to modernising and transforming the college sector was the launch of the newly developed National Certificate (Vocational) (NCV) curriculum framework in 2007 and a new governance structure that granted college councils significant autonomy to steer institutions and employ their own staff. The implementation of the NCV curriculum represented a major shift in college provision away from past forms of training, which had been perceived to be based on a rather narrow trade training model, to general vocational programmes. These vocational programmes were to support “the development of vocational skills with a sufficient breadth of knowledge and a strong general education foundation” (Kraak, 2014:43) and would replace the N-programmes of Report 190/191. How this played out in reality is further discussed in section 1.2.2.1.

The fourth substantive policy intervention was the publication of the National Plan for Further Education and Training Colleges in December 2008 with its key feature to market and brand colleges as institutions of choice. The plan delineated a new vision and mission for the sector, namely, to increase youth and adult participation in FET colleges, to introduce a system of programme qualification mixes so as to ensure differentiated delivery and to build strong linkages with industry in support of work experience opportunities (Kraak, 2014; Perold et al., 2012:103–107).

The establishment of the Department of Higher Education and Training in 2009 was the fifth major step forward in integrating vocational education and training policy (Perold et al., 2012:105–106). This new Department saw the merging of universities, colleges, adult learning centres and private education institutions with skills development authorities, skills regulatory bodies and entities, sector education and training authorities (SETAs), the National Skills Authority and the National Skills Fund. The educational institutions mentioned were

previously under the auspices of the Department of Education, while the latter-mentioned entities previously resorted under the Department of Labour. This was the first critical step towards an integrated post-school system that will, it is believed, resolve many of the problems previously faced in vocational education and training (OECD, 2014a). The migration of the then FET colleges to administration under DHET also commenced in June 2009, thereby shifting the function of administering the colleges from provincial to national government level. Kraak (2014) explains that this function shift to some extent reversed the autonomy granted to colleges in 2007.

The sixth major impact was the Green Paper for Post-School Education and Training in January 2012, in which the DHET committed to ambitious targets to be attained by 2030, for example the target of a headcount of 2.5 million enrolments in colleges. The White Paper for Post-School Education and Training ("White Paper" going forward) followed and was approved by Cabinet in November 2013 (South Africa, 2013c). The White Paper is a definitive policy statement of government's vision for an integrated PSET system, which is made up of a diverse range of educational institutions and institutional types ranging from universities and agricultural colleges to TVET and community education and training colleges (South Africa, 2013c:preface). The White Paper (South Africa, 2013c) recognises the right to access different post-school educational institutions, envisioned to expand considerably over the next 20 years, which must provide high-quality education. However, the PSET system "should not only provide knowledge and skills required by the economy, but should also contribute to developing thinking citizens, who can function effectively, creatively and ethically as part of a democratic society" (South Africa, 2013c:vii–viii).

The most recent changes and legislative amendments for the TVET college sector pertain to name changes, the development of a policy framework for workplace-based learning, new funding models, and a revision of the norms and standards for funding TVET colleges. Amended legislation in 2013 initiated the change of name from "Further Education and Training Colleges" to "Technical and Vocational Education and Training Colleges", which is the more globally used term. Moreover, the FET Colleges Act, No. 16 of 2006, was amended to the Continuing Education and Training Act, No. 16 of 2006, which makes provision for the establishment, governance and funding of two types of public colleges, namely, TVET and community education and training colleges (Kraak, 2014). Although both college entities are legally established in terms of Continuing Education and Training Act, the purpose and mandate of these two institutional types are different. In the White Paper (South Africa, 2013c:11-12) the main purpose of TVET colleges is explained to be training young school leavers, and providing them with the skills, knowledge and attitudes necessary for employment in the labour market. TVET colleges primarily should provide graduates with the mid-level skills required to develop the South African economy and colleges; they therefore tend to concentrate on offering qualifications and programmes in engineering and construction, tourism and hospitality, and general business and management studies.

The consequences of the historical legacy and policy developments for TVET colleges highlighted in the preceding paragraphs did not always have the desired effect for their graduates. As Kraak (2014:47) asserts, the substantial reforms and new policies intended to stabilise colleges and improve system efficiency ironically deprived the TVET college system of the intended stability and continuity in some instances. Consequently, a turnaround strategy was implemented during 2012 to 2015, with the purpose of building capacity in terms of student access and support services, strengthening governance and management of college resources, as well as increasing the responsiveness of colleges to local labour markets. However, its implementation has already been extended beyond 2015 (South Africa, 2013c:12).

Another result of the abovementioned reforms and transformation is that TVET colleges have been positioned as an integral component within the PSET landscape for intermediate and high-level learning and skills development. In terms of the strategic vision of the Department (South Africa, 2015b:28), colleges are to increase “access and success in programmes leading to intermediate and high level learning,” but also to provide access to occupationally directed programmes in needed areas, thereby “expanding the availability of intermediate level skills with a special focus on artisan skills.” The National Skills Development Strategy (NSDS) III in addition identifies TVET colleges and universities as the primary institutions to provide greater levels of access to education and training in rural areas, drive skills development and increase collaboration between the skills system, government and industry.

Given these strategic objectives and policy mandates, it is essential that TVET colleges develop and maintain close working relationships with employers to prepare students for the workplace and/or self-employment. The White Paper (South Africa, 2013c:16) advocates close partnerships between colleges and employers so as to locate opportunities for work-integrated learning and to help to place students when they complete their qualifications. In addition, opportunities could be secured for college staff to get regular workplace exposure so as to keep abreast of developments in their industries.

Despite the reforms and transformations intended to place TVET colleges at the heart of technical and vocational skills development, in general these colleges still have a low status, which emerges from history and has implications for how the curriculum is constructed. Curricula often fail to give students access to more powerful knowledge that would allow them to adapt to changes in the workplace environment, as they are narrowly developed or aimed at a specific workplace. Therefore, TVET colleges continue to face challenges to deliver “a skilled and capable workforce to support an inclusive growth path” (South Africa, 2015b:28) and to adequately prepare college graduates for employment. Some of these employability challenges faced by graduates are discussed in the next section.

## 1.2.2 Employability challenges of TVET college graduates

TVET colleges are mandated in the White Paper (South Africa, 2013c) and the strategic plan of the Department (South Africa, 2015b) to provide intermediate and high-level learning and skills development with specific focus on artisan development (refer section 1.2.1). However, certification rates (except for Engineering Studies) are generally below 50%<sup>1</sup>, suggesting that colleges are performing poorly in this regard. In this section, I identify some key challenges with regard to programme offerings and curriculum delivery by TVET colleges that ultimately impact on the employability of their graduates. These challenges relate to:

- (i) responsiveness and relevance of curriculum offerings;
- (ii) the paradigm of education and training and skills development in South Africa;
- (iii) the context for work-integrated and workplace-based learning; and
- (iv) the work readiness of graduates and transition to employment.

The existence of these challenges suggests that there are still many systemic obstacles and a culture of non-performance in colleges that hinder performance and achievement of the said strategic objectives.

### 1.2.2.1 Relevance and responsiveness of college curriculum offerings

According to McGrath (2004b:165), responsiveness is closely related to employability in the contemporary discourse about college quality. Employability suggests that colleges should be doing more to improve labour market outcomes for their students, but it also implies that there is a labour market demand element to the equation. However, issues of relevance and responsiveness of education and training are not unique to South Africa and present as challenges to any vocational education and training system that is driven from a supply-led paradigm (Gamble, 2003; McGrath, 2004a) – such a paradigm for skills development is elaborated upon in section 1.2.2.2.

TVET colleges offer a range of curriculum offerings that are inclusive of the National Technical Education (NATED) Report 190/191, NCV, occupational, higher certificate and other level 5 and 6 programmes. According to the White Paper (South Africa, 2013c:14–15), the relevance and responsiveness of these programmes and other systemic factors continue to impede the delivery of well-prepared graduates for the world of work. The major offerings in TVET colleges currently are the NATED Report 190/191 programmes, containing Engineering Studies (N1–N6) and General and Business Studies (N4–N6) programmes, and the NCV qualification with 19

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<sup>1</sup> These certification rates are available in the statistical publications of the Department of Higher Education and Training (2014-2016) as well as reports on performance by the Technical and Vocational Education and Training Branch of the same Department.

vocational programmes. Both these qualification offerings are funded by State using a formula that takes into account a range of service delivery issues, including the types of programmes being offered (recorded in a Ministerial approved register), full-time equivalent (FTE) students, cost of delivery including staff, capital and infrastructure requirements, and the ability of colleges to utilise resources efficiently (South Africa, 2015c:11). This programme funding is the major source of operational income for colleges. Occupational and other programme offerings are at present funded from additional income streams such as the National Skills Fund, discretionary grants awarded by SETAs, fee-for-service income and other college-generated income such as student fees.

Historically, technical colleges delivered the trade-oriented NATED Report curriculum (popularly known as the N-programmes) in terms of offering the theoretical component of the old apprenticeship system. They were specifically designed for industry and were presented as trimester programmes – learners would spend one trimester in the college and two trimesters in the workplace. These curriculum offerings were later extended in the NATED Report 190/191 to include business and general studies offerings, such as different management courses (e.g. Marketing and Business Management) and service industry courses such as Hospitality and Tourism. However, over the years, the neglect of the N-programme curricula meant that they became outdated. Although some employers still support them (for example, the N2 Engineering Studies certificate is still a commonly used pathway to a trade test), many are concerned about the outdated curricula. Further, most of the students no longer spend time in workplaces because of difficulties in finding opportunities in the labour market. As a result, they often only complete the theoretical parts in a college, which leaves them with a theoretical part-qualification and without any practical or work experience (South Africa, 2013c:14–15).

As alerted to by Kraak (2014:43–45) in section 1.2.1, the NCV curriculum was implemented in 2007 without any piloting. It represented a major initiative to shift college provision away from the narrow trade training model to more general vocational programmes. The NCV curriculum implementation met with severe criticism and resistance with regard to aspects such as the practical component of the different programmes, the admission policy and the fact that there is no provision for part-time or distance learning (South Africa, 2013c:14–15). Originally meant for young people completing Grade 9, learners who had finished schooling levels up to the National Senior Certificate at NQF level 4 were allowed, and even encouraged, to enrol in these programmes. This has made life difficult for lecturers, who must deal with students with vastly different educational levels in the same class. It has also led to dissatisfaction among students, many of whom must repeat much of what they have previously covered in the fundamental subjects (i.e. languages, Mathematics and Life Orientation) while at school. Furthermore, Kraak (2014:45–46) clarifies, the higher cognitive demand of the NCV curriculum, poor completion and throughput rates, and the complaint that the NCV has not been adequately aligned to the needs of industry exacerbated colleges' challenge of having a responsive and relevant programme and qualification mix.

Colleges also offer occupational programmes and shorter skills courses that are sector-specific and relate to professional, vocational, technical and academic learning for qualifications and awards which are needed in workplaces or which have been identified as sectorial or national priorities (South Africa, 2011, 2013c:61). However, McGrath (2004b) highlights that the delivery of occupational and skills programmes through modes such as learnerships and apprenticeships necessitates a compulsory workplace component, which in turn may be a deterrent for some colleges that have not established such linkages. Further, in my experience working with the strategic planning of colleges, relations with SETAs are still not good enough and arrangements for learnerships in colleges continue to be inadequate.

In line with sections 43(3) and (4) of the Continuing Education and Training Act, colleges may offer higher education programmes under the authority of a higher education institution and after approval has been granted by the Minister. As a result, level 5 and 6 programmes have been introduced in some colleges in partnership with universities. These programmes are often occupationally directed with strong articulation possibilities into higher education. However, the uptake of higher certificate and other programmes has been slow and the success rate has yet to be determined (South Africa, 2013c).

The explanation of this slow uptake of more relevant and responsive curriculum offerings is not simplistic, nor can it be attributed to a single causal factor. Some of these reasons reside in criticisms of the curriculum delivery and instructional offerings of colleges as being outdated, the poor quality of teaching and learning, poor success rates, weak linkages with workplaces and industry for placement of students and graduates, antiquated technology, and a lack of endorsement and approval of curricula by industry and commerce (Cosser, McGrath, Badroodien & Maja, 2003; Gamble, 2003). As McGrath (2004a) concludes, colleges appear to be failing as pivotal players in skills and artisan development and to be part of the solution for growing youth unemployment.

It appears, though, that discourse on a relevant and responsive programme and qualifications mix for TVET colleges, apart from systemic issues such as the funding, accreditation, legislative requirements and capacity, is located in the domain of the framework for human resource and skills development in South Africa. This framework is discussed next.

#### **1.2.2.2 The framework for human resource and skills development in South Africa**

It should be noted from the onset that in this section I do not attempt to engage in critique of the influence of human capital theory and productivist perspectives on human resource and skills development paradigms in South Africa. Instead, I provide a perspective regarding the supply-side of education and training (TVET colleges form part of the institutions in this domain) and the challenges presenting for graduates emerging from these supply-side institutions.

In South Africa in the early 1990s, it was believed that education could be the solution to social and economic problems (Allais, 2014:xvii) and “economy (and more specifically the market) has come to be seen as a model for education” (Allais, 2014:xxi). Allais (2014) further argues that positing education within a neo-classical economic framework illustrates a lack of willingness to tackle structural economic and political problems, while these have considerable negative consequences for individuals and education systems. This kind of restricted and instrumental perspective results in education and training being viewed as a “malleable practice and a generic service, making it easier to treat it as a mere commodity to be delivered on the market by the most competitive provider” (Allais, 2014:xii). As a consequence, curriculum and pedagogy are conflated to such an extent that policymakers believe they can redefine education to fit the needs of the moment, which is frequently to solve economic problems.

Other voices of discontent (refer Dloto, 2015; McGrath, 2012; Motala & Treat, 2014; Motala & Vally, 2014; Powell, 2016) in agreement also argue that neoliberal and capitalist views affect thinking and notions about the role of education in society and curriculum development, particularly from a policy point of view. Anderson (2009) builds on this argument and asserts that vocational education and training (VET) systems, as in South Africa, are often built on two key productivist assumptions: (i) training leads to productivity and economic growth (training for growth), and (ii) skills lead to employability and to jobs (skills for work). Motala and Vally (2014) in support agree that it is falsely assumed that increased educational attainment by itself will lead to higher economic growth and consequently make a significant dent in the high levels of unemployment. The development of workers with advanced knowledge and skills may be a desired goal, but such investment, Collins (2013) points out, may exacerbate rather than reduce mass unemployment and economic inequality. Therefore, human capital development premised on the possibility of increased economic growth, as TVET colleges have increasingly done, is misguided and offers some explanation as to that a great number of college graduates continue to find themselves alongside the unemployed (Motala, 2014).

Lanning and Lawton (2012:20) caution against neglecting the demand-side of education and training in any argument on skills development and employment as new programme offerings may increase the output of graduates with vocational qualifications, but leave the low-skill, low-wage business environment unchanged. Lanning and Lawton (2012:3) further argue that the strong focus on skills development as the solution to weak productivity, low wages and poor progression opportunities often results in an over-reliance on centralised, state-led programmes and institutions (supply-side dominance) to fill the gap left by the market and to achieve economic competitiveness and social justice. In fact, such approaches have been “consistently unable to ensure that improved skill supply is matched by greater demand for, and utilisation of, skills in the workplace” (Lanning & Lawton, 2012:20). Delbridge, Edwards, Forth, Miskell and Payne (2006) in support assert that skills can make a substantive contribution to productivity only if they are effectively deployed in the workplace.

The emerging consensus is thus that participation of the demand-side in the skills development and employability discourse is essential. This can partially be achieved through employer 'buy-in' and involvement in programmes offered at colleges and other supply-side institutions (Kraak, 2014:41). However, this has not been the case for the TVET college reforms in South Africa. While these reforms were billed as employer-led, Kraak (2014:47) explains the reality to be that few or no actual employers were directly involved. In turn, the curriculum and other reforms led to disillusionment, employer alienation, a degree of cynicism for both employers and public-sector partners about employer-led reform, and a large gap between the official policy rhetoric and the reality on the ground. More specifically, the TVET college sector reforms<sup>2</sup> were centrally imposed and statist, involving little consultation with employers, and the results have been disastrous – college throughput rates plummeted and a high percentage of college graduates face unemployment (Kraak, 2014:40). The result, Kraak (2014:40) concludes, is that there is no adequate platform for the development of the required vocational and career-oriented skills in order for government to achieve its medium- to long-term economic goals.

It can therefore be concluded that to regard the institution of TVET (and education and training per se) within an ethos of productivism and the ideological framework of neoliberalism is a restricted and instrumental view of life-worlds. This restricted view, Anderson (2009:44–45) cautions, overlooks the complex and interdependent nature of human existence, and the source and meanings inextricably linked to the social relations, cultural practices and natural material conditions of education and training. According to Anderson (2009:44–45):

TVET students are not only already, or aiming to become, workers. They are also human beings and citizens with a wide range of needs, relationships, duties, aspirations and interests beyond work; in the family, the local community, in civil society and the global environment.

Education and training in such a view is a sustainable resource and not to be regarded as a limited commodity (S. May, 1994:53). In this regard, Allais (2014:xii) believes there should be a return to focusing on the intrinsic value of education and its role in society, the world of work and the economy as a starting point when reforming curricula and educational delivery. This research intends to provide one such starting point in terms of literacy development.

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<sup>2</sup> These policy reforms include the introduction of sector skills councils or authorities and a national qualification framework (NQF); competitive funding arrangements; establishing a monitoring and evaluation system in the public sector that focuses on performance appraisal and target setting; and development of a new set of national vocational qualifications (the NCV qualification referred to in sections 1.1 and 1.2.2.1).

### 1.2.2.3 Work-integrated learning and workplace-based learning

Another major challenge for colleges is posed by the absence of strong, viable partnerships with industry in localised or regional settings to meet employers' demand for skills and provide work-integrated learning opportunities (Akoojee & McGrath, 2008; Cosser et al., 2003). The hostile labour market and economic environment (e.g. jobless growth and unemployment rate) constrain take-up of learnerships and placement of college students or graduates for workplace-based learning, thereby inhibiting adequate preparation of graduates for the world of work (Cosser et al., 2003). Bello, Shu'aibu, Bin Saud and Buntat (2013:205) conclude that technical and vocational education graduates are therefore not only challenged in terms capabilities in the world of work, but also in terms of being adequately prepared and ready to manipulate new jobs, new products and also new services as result of innovation and technological developments.

Moraes (1998) and the White Paper (South Africa, 2013c:viii) similarly recommend greater involvement of the private sector and workforce to cultivate a culture of work-integrated learning in policy development and implementation so as to address the often-repeated refrain by employers that the products of the education and training system are not ready for the workplace (South Africa, 2015a:sec. Preamble). As students are preparing for careers in the labour market, practical experience in the world of work should be an invaluable part of their training. In the TVET college context, for example, students who have completed the NATED N2 or N3 or related NCV programmes require structured workplace-based learning to progress to a trade test and qualify as an artisan. Furthermore, students who have completed the NATED N6 programme require work experience in order to meet the requirements for obtaining the N-Diploma. Even in programmes where workplace-based learning is not a requirement for graduation, for example a non-trade related NCV programme such as Management, work experience will improve students' employability. Practical workplace experience will even benefit those students who do not find jobs in the formal labour market when they seek alternative ways of earning sustainable livelihoods (Altman & Marock, 2008).

Workplace-based learning thus not only helps to improve the responsiveness of the programmes delivered to students, but work-based learning programmes as a pedagogic tool can significantly ease the transition of institution-based learning to work. According to Evans, Guile and Harris (2011:155), the central focus and benefits of workplace-based learning relate to enculturation into how things are understood and done in the workplace, building technical competence in line with occupational standards, and improving work practice, innovation and renewal through students' participation. Workplace-based experience not only facilitates learning about the ethics, professional practice and social contexts of workplaces, but also cultivates understanding of the professional and/or occupational field in order to shape an identity in terms of the specific vocation or profession.

Therefore, through work-based learning, valuable employability skills and attitudes are developed which make graduates much more attractive to potential employers. What these graduate attributes and work readiness entail is elaborated on in sections 1.2.2.4 and 1.2.3.3.

#### 1.2.2.4 Transition to employment and work readiness of graduates

Student articulation and transition after college – whether into higher and further education and training and/or employment – also pose challenges. Graduates with TVET qualifications often struggle to gain access to higher education degree programmes, for a number of reasons<sup>3</sup> (Kraak, 2014:47). Some of the reasons for college graduates struggling to find employment are expounded in sections 1.2.2.1 to 1.2.2.3 and in the findings from a tracer study by Gewer (2010).

Gewer (2010) explored the factors that impact on the transition of young people from TVET colleges to work via the TVET colleges. He sought, from the individual perspectives of the respondents, to understand the social and economic factors that influenced young people to study at TVET colleges and the experiences of a cohort of graduates leaving TVET colleges and attempting to enter the labour market. The research findings revealed that the interests of the individual learner and the affordability and accessibility of colleges were the prime determinants in choice of education. Learners further believed that TVET colleges were not actually playing a meaningful role in exposing them to the workplaces or providing linkages to employers; instead, they felt that colleges provided them with abstract preparation in the classroom. Learners also indicated that the colleges provided no actual workplace experience. All of these factors led to a situation in which, because of limited links between TVET graduates and relevant places of employment, learners relied on personal contacts, family relations and newspaper advertisements to find jobs, none of which effectively guaranteed meaningful employment.

Gewer and others (refer Akoojee & McGrath, 2008; Altman & Marock, 2008; Cosser et al., 2003; McGrath, 2004b) in solution propose renewed focus on workplace-based learning, which in turn necessitates that TVET colleges form partnerships with employers for these work placement opportunities. Although DHET initiated a process in 2013 to develop a policy framework for workplace-based learning, this framework has not been implemented to its full extent yet. Work-integrated learning practices in TVET colleges are therefore marginalised and grossly underfunded, thereby diminishing their existence and efficiency. The absence of these

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<sup>3</sup> These reasons are not explored within the scope of this study. One of the challenges TVET college graduates face, despite policy intervention, is gaining access to a university or university of technology, especially those graduating with a NCV L4 certificate.

industry and workplace partnerships contribute to the fact that TVET college graduates are neither adequately prepared for work nor work ready (refer section 1.2.2.3). Exposure to and engagement with the world of work not only develop technical competence, but also facilitate the development of non-technical or non-curricular skills and attitudes (Evans et al., 2011). The latter skills are often referred to as graduate attributes and employability skills, and the development thereof aims to drive improved employability of new entrants to the workplace. The way in which workplace literacy development fits into this context of work readiness is explained in section 1.2.3, with specific reference to the conceptual framework for literacy development in TVET colleges expounded in Chapter 2.

In conclusion, although a number of policy interventions and reforms have been implemented and more are intended, graduates emerge from TVET colleges with qualifications influenced and dominated by labour market supply-side ideology and policies. In addition, colleges face a number of institutional difficulties and a hostile labour market that hinder responsiveness in terms of critical and relevant skills provision. Graduates are therefore often ill-equipped for the world of work and unable to transition into employment as a result (refer Allais, 2014; Gamble, 2003; Gewer, 2010; Kraak, 2014).

I explore the context of the modern-day world of work and employability attributes in the next section to determine the overall impact of these factors on the employability of TVET college graduates.

### **1.2.3 Perspectives on the modern-day work and employability**

In the previous section, I elaborated on the context of TVET colleges and the challenges colleges and graduates face in light of employability and responsiveness to labour market demand. In this section, the other side of the coin is regarded by considering perspectives on the current work environment and employability. It should, however, be noted that this research engages with employment and employability of TVET college graduates in a workplace literacy perspective rather than an economic perspective.

#### **1.2.3.1 Emerging workplace environments**

What are the characteristics and requirements of the workplace that the TVET college graduate will enter into? Heinz (2009:172) describes the modern-day workplace as a “post-industrial service society which has been transformed from an employment system with strong linkages to education, training and occupation to a system that operates according to the criteria of employability, cost-efficiency and flexibility.” Emphasis in this work environment is shifting away from high-volume production to high-value production and from standardisation to customisation (Hiniker & Putnam, 2009:205–206; Rojewski, 2009:23). Efficiency and continuous improvement are aims to be achieved by usually small teams of multi-skilled workers who take increased responsibility for meeting production targets and who draw on knowledge and insights obtained to make suggestions for even

greater efficiencies (Black, Yasukawa & Brown, 2015:216; Cazden et al., 1996:6). Keursten and Kessels (2002:1) add that, in this new environment, “focus is shifting from appreciation of physical labour and the ability to co-ordinate and regulate to the ability to contribute to knowledge generation and application.”

This emerging work order is, Castleton (2002:553) elaborates, knowledge-driven and founded in human capital ideology with the human aspects of work dominating over more traditional technical and mechanical features. Knowledge has become an important intangible asset and handling information is a key feature of work, from which in turn a knowledge-age worker emerges. The knowledge-age worker, whom Drucker (1999, 2007) regards as “the most valuable asset of a 21<sup>st</sup> century institution”, contributes to knowledge generation and application in the workplace and provides customised services and products (Ives, 1992:xliii; Rojewski, 2009:23).

In such knowledge-driven context, workplaces gradually transform into “learning organisations” which, as Hunter (2007:245) and Kerka (1995) explain, are characterised by continuous opportunities for new learning and the use of newly acquired knowledge to achieve workplace goals. As such, individual performance becomes intertwined with organisational performance and any subsequent creative tension is embraced as a source of energy and renewal. Hammer and Champy (1993:66) claim that this greater component of participation, individual growth and learning, which results in more productive and efficient work, contributes to work environments becoming “more satisfying” while simultaneously having purpose and meaning.

As explained in the preceding paragraphs, modern-day levels of productivity and competitiveness in work environments are brought about by information and knowledge, which in turn are supported and powered by information technology (Black et al., 2015:614; Gamble, 2003:14; Gray, 2016). To quote Moe and Blodget (2000:3), “technology is said to be the driver of this economy and human capital its fuel.” Moreover, Gamble (2003:14) elaborates that the improved telecommunication and informational systems have provided workplaces with the capacity to globally organise themselves in terms of market and supplies, and most jobs are influenced by what happen in the global centre or core of the economy. As a result, workers often function within multi-skilled project teams that have to efficiently use technology to locate, manage and communicate business information (Katz, Haras & Blaszczyński, 2010:135).

In order to ensure organisational competitiveness, flexibility has become a dominant theme and is inherent in all spheres of the workplace (Fenwick, 2001). Fenwick (2001:5) explains flexibility in the workplace to be characterised by workers becoming flexible (i.e. more responsive, adaptive and transferable) and functioning in flexible organisational structures, which are less hierarchical and more insecure, fluid, and adaptive to consumer demand and changing markets. Increasingly, flexibility pervades all business management practices, which are characterised by continued downsizing and restructuring. It within this flexible environment that workers are expected to accept constant change as a given and to assume personal responsibility for adapting to changing needs of organisations for skills and work (Delbridge et al., 2006; Edwards, 1998).

Working life has consequently become, Reich (2000:8) concludes, “more frenzied, less secure, more economically divergent, more socially stratified” and these changes impact on the requirements for work - elaborated on in the next section. The changes in the work environment and requirements for work also informed the conceptualisation of workplace literacy in Chapter 2 in respect of which multiple literacies (literacy used in different contexts for different purposes) and multi-literacies (literacy used in different meaning-making modes) graduates need to develop to work in these highly technical, knowledge- and value-driven and flexible work environments.

### 1.2.3.2 Changing requirements for work

According to Billett (2009:179–185), work in a modern-day context is more conceptual, specialised and complex. New technologies and transformation of work practices restructure and expand the nature of work, thereby making work less routine, and demanding conceptual thinking, flexibility and being able to manage diversity. Since work has become so specialised and diverse, it increasingly requires continuous and richer procedural and conceptual learning or development (Billett, 2009:181–182). How much guidance or mentoring may be required for effective work performance depends on the degree to which the requirements for work are different, complex or new (Heisig, 2009).

Within constant change and a transformed work practice, there is continuous demand to be flexible and exercise discretion (Billett, 2009:179–185). For example, particular technologies could require individuals to attain specialised expertise in order to cope with changed work processes or workers could be asked to perform a wider range of tasks when others have been laid off (Reich, 2000). Moreover, Noon and Blyton (2006:84–86) add that job expansion and changes to workplace practices often introduce increased demands for discretion in that ordinary workers have to take autonomous decisions when performing work tasks.

Increasingly, in work contexts where technological requirements are high, performing work becomes reliant upon conceptual and procedural knowledge, and the ability to make intelligent decisions is based on both formal knowledge and practical know-how (Billett & Somerville, 2004; Billett, Smith & Barker, 2005). Zuboff (1988) for example describes how the use of bedside computers eases work performance and routine monitoring tasks to be performed by nurses, but also makes work more abstract and difficult to comprehend. The use of digital technology in nursing requires understanding of operations and functions represented in digital form, which is more complex and conceptual than physically observing and engaging with the patient.

Work is also increasingly based on interactions with others, tools and artefacts within different communities of practice (Kotsik, Tokareva, Boutin & Chinien, 2009) when performing diverse tasks across work situations (Heerwagen, 2006). These interactions and relationships, Castleton (2002:559) explains, rely heavily on “culturally shared understandings and acceptance of accounts of how work is done.” Thereby, work practices

are both premised in and have become a product of social interactions in what Hughes (1958:53) calls the “social drama of work.” Basic requirements for work performance therefore necessitate well-developed socio-relational capabilities so as to function in teams and for purposes of collaboration and networking (Billett et al., 2005; Suarta, 2012:640).

It is within these changed workplace environments (where jobs are limited) and requirements for work that the focus has shifted from training for employment to training for employability. In the next section, I consider which employability attributes and competences are crucial to prepare graduates for the modern-day workplace and work, as well as to what extent workplace literacy competences contribute to developing such employability attributes.

### 1.2.3.3 Employability attributes and competences

There has been a growing focus on and discourse about graduate attributes and related employability competences over the last decade. In McGrath’s (2009:1) view, the reasons for this lie in the decline of industrial production and the rise of a services- and knowledge-based economy, together with society (rightfully or wrongly so) embracing education and work as the ways to end poverty and social exclusion (refer arguments in sections 1.2.2.2 and 1.2.3.1). Further, notions of lifelong learning and boundary-less careers, portraying the world as one of exciting opportunities for those that embrace it, necessitate a new form of preparation and fitness for the world-of-work – the latter being how Winch (2002) defines employability.

Yorke (2004:410) elaborates on this fitness for work (i.e. employability attributes) and defines employability as “a set of achievements, skills, understandings and personal attributes that make graduates more likely to gain employment and be successful in their chosen occupations.” This particular set of competences and attributes benefits the graduates, the workforce, the community and the economy. Employability is a necessary condition for gaining employment, consists of more than core and key skills and is derived from complex learning (Yorke & Knight, 2006:3). Developing employability is thus strongly aligned with valuing good academic learning (Yorke & Knight, 2006:3) and employability competences should not be viewed as oppositional to academic skills and attributes (Blaxell & Moore, 2012:2).

According to Archer and Davison (2008:8), employers all value the technical and discipline competences which graduates possess from degree studies, but many lack appropriate skills, attitudes and dispositions, which in turn prevent them from participating effectively in the workplace (Cumming, 2010:407). This range of broader capabilities, attitudes and dispositions allows individuals not only to adequately perform various tasks and carry responsibilities within a job, but also to adapt to changes in the internal and external labour market (De Vos, De Hauw & Van der Heijden, 2011:439; Scholarios, Van der Heijden, Van der Schoot, Bozionelos, Epitropaki &

Jędrzejowicz, 2008). Employability competences equip one to work in a global and customer-focused environment, in different countries, and in multicultural teams (Lowden, Hall, Elliot & Lewin, 2011:6).

Many terms are used to refer, in general and official terms, to these employability competences and attributes, such as core skills, key skills, common skills, transferable skills, essential skills, functional skills, skills for life, generic skills and enterprise skills (Tymon, 2013). While there are variations in the classification of employability, there is a broad understanding of what qualities, characteristics, skills and knowledge constitute employability (Lowden et al., 2011). These attributes and competences generally include team-working, communication, leadership, critical thinking, problem-solving and personal and interpersonal managerial abilities (refer Lowden et al., 2011; Robinson, 2000; Tymon, 2013).

Gray and Herr (1998) categorise the skills any graduate has to acquire for labour-market advantage at three tiers, namely, work ethics, academic skills and specific occupational skills. Work ethical skills and related behaviours are essential for all types of work, while academic skills – consisting of literacy, mathematics, communicative competence and science – are necessary for functioning in a modern high-technology work environment (Askov & Gordon, 1999:59). Occupational skills are those required for occupation-specific and technical specialisation.

The World Economic Forum (Schwab, 2014) similarly categorises the most valuable worker attributes and competences. The top 10 employability capabilities include complex problem-solving, critical thinking, creativity, people management, coordinating with others, emotional intelligence, judgement and decision-making, service orientation, negotiation and cognitive flexibility (Gray, 2016:2). Furthermore, interpersonal and intercultural competencies strongly support employability – teamwork capabilities, cultural awareness, sensitivity to diversity and multi-lingual capabilities, among others, are regarded as essential competences to function in the modern-day work environment (Australia, 2002; Blaxell & Moore, 2012:1; Khandu, 2014:2).

Moreover, a comparison of categories of employability skills frameworks (those of Australia, Canada, the United Kingdom and the United States) reveals similarities in what is regarded as key to employability (Beven, 2009:1250–1251). Certain personal attributes (e.g. loyalty and commitment, positive self-esteem, a sense of humour, honesty and integrity, and the ability to deal with pressure) contribute overall to employability (Australia, 2002). Other key employability skills, Tsai (2013:353) elaborates, commonly include having the capacity for analysis and problem-solving, and the ability to communicate ideas and information, plan and organise activities, and collaborate with others. Possessing employment-related skills is invaluable in this context. These competences include an understanding of the work environment, career options and pathways to employment and lifelong learning as well as to be confident, creative and productive users of new technologies, particularly information and communication technology (ICT) (Tsai, 2013:353).

Despite there being no universal agreement on the content of employability frameworks, there is a common thread in terms of the personal attributes and technical and professional competences associated with employability (Tymon, 2013:852–853). The most commonly personal attributes, cited in the classifications in the preceding paragraphs, include flexibility and adaptability, displaying ethical behaviour, a positive self-esteem, and commitment and dedication to productive work. Agreed-upon technical and professional capabilities include communication competences, teamwork and managing intercultural diversity, critical and innovative thinking and problem-solving capabilities, effective use of ICT, as well as planning and organising oneself and one's work. The latter attributes are often lumped together under the heading of workplace literacy. How workplace literacy could develop and enhance these capabilities and attributes in a TVET college context is argued in the conceptual frameworks in the next chapter.

#### 1.2.3.4 Preparing graduates for work

As described in the previous section, employability is as highly contested a domain as literacy. In this section, I consider the two dominant approaches to employability and how these approaches affect the preparation of graduates by education and training institutions. The role of institutions in developing employability in graduates is also explored in the context of the relationship between employability competences and attributes, work and required literacies.

McGrath (2009:1–3) explains that there are two dominant traditions in the employability discourse. The narrower supply-side focus is valuable in its generation of individual skillsets and support of national and institutional policies and practices, which can contribute to improving individual employability. However, in such an approach employability is mainly constructed as skills, and education and training institutions (including colleges) determine what kind of skills or competencies should be developed in graduates as preparation for working life. Consequently, this narrow and limited focus is reflected in the curricula offered at colleges and other training institutions (Tsai, 2013:347).

McQuaid and Lindsay (2005:194) argue that, on the other hand, a broader, interactive approach to employability permits the additional consideration of vital demand, personal circumstances and other factors that influence the employability of people in a particular labour market or at a particular time. This labour-demand approach locates employability within labour market dynamics and balances individual agency with the structural factors of the economy. However, such a beyond-skills approach requires far more and elaborate changes in curricula to allow for integration of and reflection on employability capabilities throughout curriculum as a whole (Mackenzie, 2002).

In such an approach, Tsai (2013:348) adds, developing employability attributes (beyond skills) comprises the coherent development of an identity and involves basic and interrelated abilities that are not easy to frame or

describe in curricula. Employability, in his view, is the “potential ability to act in different contexts, based on scientifically based knowledge, as well as an ability for continuous learning and empowerment.” It is about learning to learn, as “lifelong learning has become the mantra of the future” (Gamble, 2003:27), but also about developing agency or empowerment, inclusive of the ability to critically reflect.

McGrath, Needham, Papier and Wedekind (2010a:48–51) add to the account the role of educational institutions (and specifically TVET colleges) in making graduates employable. The broad focus of institutions should not be about passing on the hard skills outlined in the curriculum, or indeed the softer interpersonal skills, but rather facilitating networks and passing on social capital. This includes modelling the world-of-work in the way the institution is set up and managed spatially and temporally, the networks of relationships that are developed by the students and alumni, and the direct contact with employers that is facilitated by formal work-based experiences and informal connections between teaching staff and employers. Further, it is imperative to prepare graduates adequately for work through (peripheral) participation in work – either by means of simulation and practical application at college level or in workplaces through workplace-based learning.

The relation between employability, work and literacy is discernible in that many employability competences or attributes (referred to in section 1.2.3.3) are mediated and developed through literacy and language. Mikulecky (1984:254) asserts that “most jobs call for literacy and computation.” He explains literacy practices to essentially be social phenomena (e.g. asking questions and gathering information from other workers, or discussing a problem with other team members) and as such they play a major role in how employees engage with work.

Askov and Gordon (1999:59) in support regard literacy capabilities as minimal for most service or production industries with specific reference to reading, writing, mathematical and computer competences. Levande (1990:1) further makes a case in point by linking literacy and capability in the instruction of technological literacy. He asserts that the use of literacy (e.g. doing research to solve problems) is required to enable capability (application such as writing a logical procedure). Literacy practices also delineate the complexities in the roles a person takes on in knowing about and using technology to do work as, for example, a scientist, technology teacher or technician.

There is also recognition in national qualification and skills frameworks of the relationship or connection between literacy and employability. As Black et al. (2015:609) point out, “literacy and numeracy skills are now officially joined with employment related skills”, with the conceptual use of the umbrella term “foundation skills” in the Australian skill frameworks and strategies. Foundation skills in the Australian framework, as in most countries, are defined as the combination of language, literacy and numeracy and employability skills such as collaboration, problem-solving, self-management, learning and ICT (refer comparison of employability skills frameworks in section 1.2.3.3). Moreover, international reports on employability, such as the Employability Challenge Report by the UK Commission for Employment and Skills (2009) and the Skills Beyond School synthesis report by the

OECD in 2014, identify the effective use of numbers and mathematics, language and ICT as the skills almost everyone needs to do almost any job and which must be present in a work context as enabling factors.

Since literacy and numeracy are embedded in workplace practices, that is, “where language, texts and mathematics are constitutive elements of work practices” (Black et al., 2015:613), developing literacy can be regarded as critical or foundational to employability. Gamble (2003:27) reiterates that employers value verbal and written communicative competence as well as mathematical proficiency as indications of general preparedness. Given these perspectives, I regard the role of colleges to be about creating enabling conditions to enhance employability (McGrath, Needham, Papier & Wedekind, 2010b; Wedekind, 2012), but in an integrated and coherent manner so that workplaces are involved. The relationship that exists between employability, work and literacy has given rise to the premise that workplace literacy development in TVET college graduates should be one of the avenues to enhance employability. The manner in which literacy should be developed in college graduates is further explored and conceptualised in Chapter 2.

### 1.3 Rationale and problem statement

Given the context of TVET college graduates and the challenges they face in terms of transition to the workplace (refer sections 1.2.1 and 1.2.2), this research aims to conceptualise workplace literacy development as an aspect to prepare graduates for the world of work. What the work order and environment entail and hold as further challenge for these graduates has been described in section 1.2.3 and informs the conceptualisation of workplace literacy expounded in Chapter 2.

A great challenge worldwide is young graduates emerging from education and training institutions or school who cannot find employment or socially useful work (Baatjes & Leurquain-Steyn, 2016). The International Labour Organisation (2005, 2014) attributes youth employment to an array of general factors which may have positive or negative consequences. These factors include:

- (i) the impact of globalisation and structural reforms in developing countries;
- (ii) the level of, and fluctuation in, aggregate demand;
- (iii) demographic trends;
- (iv) the level of economic activity, public and private investment, and sustainable growth;
- (v) the employment intensity of growth in developing countries;
- (vi) an enabling regulatory environment for all enterprises and the protection of workers' rights;
- (vii) entrepreneurship and enterprise creation options, including through cooperatives;
- (viii) education and training outcomes;
- (ix) the relationship between education and labour market needs; and
- (x) work experience and labour market services.

Given these contextual and individual factors, employment (and so unemployment) cannot be discussed within a single causal paradigm. On the one hand, Akoojee and McGrath (2008) as well as Cloete and Butler-Adam (2012) explain that the issue of aggregate demand (job availability) is the chief demand-side constraint, followed by the nature of labour demand (the types of jobs available). On the supply side, youth labour-market success is influenced by capabilities such as education levels (e.g. premature exit and insufficient schooling), social capital and so-called soft skills. These factors cause many young South Africans to lack preparedness and competences for job environments in a high-skills economy, resulting in a significant number of youth being underemployed or unemployed, seeking employment or being between jobs, or working unacceptably long hours under informal, intermittent and insecure work arrangements (Akoojee & McGrath, 2008; Altman & Marock, 2008; Mlatsheni, 2012).

The consequences of youth unemployment, whatever the cause, are dire for these individuals, as well as for the workplace, economy and society overall. Akoojee and McGrath (2008) point out that youth unemployment and underemployment impose heavy social and economic costs, resulting in the loss of opportunities for economic growth and unutilised investment in education and training. Mlatsheni (2012:31–32) further alerts that, because of unemployment, South African youth face a number of societal challenges, which include the threats of compromised health (both physical and mental), teen pregnancy, gangsterism and crime. Also, once youth have left school or college, they face the challenge of labour-market entry. An unsuccessful transition to work may lead to a long duration of unemployment, which in turn may cause depression.

As asserted by Cloete and Butler-Adam (2012), aggravating factors on the demand-side of the youth unemployment problem are economic growth and job availability. In a review of vocational education and training in South Africa in 2014, the OECD found that economic growth in South Africa has been weaker than in other emerging economies, thereby leaving many young people and graduates disengaged from education and work (Field et al., 2014; Leke et al., 2015). In South Africa in 2017, 32.4% of those aged 15 to 24 were not formally employed, nor in education or training (Statistics South Africa, 2017). This group has been coined as the 'NEET' generation (Cloete, 2009) and as such has become a focal point in government strategy, especially that of the Department of Higher Education and Training. Dr Blade Nzimande, former Minister of Higher Education and Training, was cited in the Mail and Guardian of 4 October 2013 as saying that:

[one of] the main imperatives of the post-school system, including the universities, is to focus our energies and resources on expanding the post-school system to cater for the 3.4 million 15 to 24 year olds who are not in employment, education or training.

With South Africa's employment rate for working-age youth lagging behind other middle-income emerging market economies, active measures to promote encourage labour market insertion by developing work-related capabilities are urged (Leke et al., 2015). The OECD (Field et al., 2014:7) in this regard recommends effective

vocational education as part of the of the solution. Globally, vocational education and training (VET) is considered a mechanism to provide skills to the youth for entry into the labour force and to support a successful professional career (Eichhorst, Rodríguez-Planas, Schmidl & Zimmermann, 2012; Leke et al., 2015; OECD, 2010), because of the opportunity provided for practical training. Moreover, VET is also crucial in equipping the labour force with a range of mid-level trade, technical, professional and management skills (OECD, 2014b). These premises are echoed in the White Paper (South Africa, 2013c) and the 2015 McKinsey report on the five big opportunities for economic growth in South Africa. TVET colleges, as key providers of vocational education and training in South Africa, therefore play a pivotal role in government's strategy to alleviate youth unemployment, necessitating their graduates to be well-prepared for labour market absorption or at least adequately equipped to find socially useful work.

Given the contextual challenges as stated above and echoing the Minister's statement in his preface to the White Paper (South Africa, 2013c:vii) about what education should aim to do, i.e. "...should not only provide knowledge and skills... [I]t should also contribute to developing thinking citizens, who can function effectively, creatively and ethically as part of a democratic society," this research focuses on the role of workplace literacy as an essential ingredient in employability of TVET college graduates. The development of workplace literacy is proposed as contributing to enable graduates to participate in South African political, social and work contexts.

#### 1.4 Research questions

As indicated in sections 1.1 and 1.3, the aim of this research is to conceptualise workplace literacy development in a TVET college context with a view of how this conceptualisation could contribute to optimal integration of the TVET college graduate into a workplace.

As such, the research questions are:

- (i) How can workplace literacy be conceptualised in a TVET college context?
- (ii) How would this conceptualisation shed light on possible workplace literacy development within a TVET college curriculum?
- (iii) Based on this conceptualisation, what are the implications for developing workplace literacy readiness?

The research does not aim to address or provide solutions to any of the complex labour market issues regarding (un)employment or workforce education emerging in a labour market demand-supply debate. Nor is it an attempt at discourse with dissenting voices (refer Allais, 2014; Motala & Treat, 2014; Motala & Vally, 2014; Spreen & Vally, 2006) against human capital and neoliberal capitalism theories. These voices strongly argue that the causes of unemployment lie in the intrinsic weakness of the economic structure and how employment is distributed rather than individual deficiencies. The research does, however, focus on the employability attributes

of TVET college graduates, but this is done through a workplace literacy perspective. On the basis of this conceptualisation, the research further proposes an assessment framework to guide determination of the workplace literacy readiness of TVET college graduates.

## 1.5 Key terminology

Definition of the key concepts is essential in order to facilitate common understanding of the conceptual frameworks and the purpose and contribution of the research. The main concept of the research, namely, literacy and more specifically workplace literacy, is defined and conceptualised in Chapter 2. The design and composition of the NCV qualification, from which the Engineering and Related Design programme was selected for the directed content analysis conducted in Chapter 3, are discussed in sections 1.6.3.1 and 3.1. Other key concepts relating to the methodology, such as 'conceptual framework', 'affordances' and 'content analysis', are explained in sections 1.6.2 and 1.6.3. The origin of the term 'technical and vocational education and training' (or TVET) and the history and purpose of these colleges were described in section 1.2.1.

### 1.5.1 Curriculum

Since workplace literacy development is analysed in terms of the affordances provided in the curriculum, it is useful to define what is meant by curriculum. Most definitions agree that a curriculum should be regarded as broader than the material standards, frameworks, guidelines or policy for teaching course content. It is also more than a list of topics and lists of key facts and skills (Wiggins & McTighe, 2006:6). It encompasses what students have the opportunity to learn and not to learn (Weisz, 2001:156) and contains the plan for how to conduct effective teaching and learning (Wiggins & McTighe, 2006:6).

Billett (2006:1) defines curriculum as "participatory practices comprising the interactions between the agency and continuities of both the social practice (e.g. educational institutions, workplaces etc.) and individuals who participate in and learn through their engagement in these practices." Lusted (1986:2–3) refers to these social participatory practices intending to transmit and reproduce knowledge and transform consciousness as pedagogy. Three conceptions of curriculum are often used to understand the practices exercised in educational institutions for this purpose. These are the intended curriculum – what is intended to occur; the enacted curriculum – what actually happens when the curriculum is enacted; and the experienced curriculum -- what learners experience, construe and learn as a result of its enactment (Billett et al., 2005:2; Porter & Smithson, 2001).

## 1.5.2 Employability

Employability is commonly seen as one of the manifestations of the rapid changes associated with the globalisation era of the past two decades. Hillage and Pollard (1998) define employability as an individual's ability to gain initial employment, maintain employment, move between roles within the same organisation, obtain new employment if required and (ideally) secure suitable and sufficiently fulfilling work. McQuaid and Lindsay (2005:191), however, suggest that "employability remains a contested concept in terms of its use in both theory and policy, and throughout the past century has been used as both a predominantly labour supply and a labour demand concept." They suggest that the narrower supply-side focus of the initiative approach is valuable in its generation of a set or sets of skills and is supportive of national and institutional policies and practices that can contribute to improving individual employability. On the other hand, a broader, interactive approach permits the "additional consideration of vital demand, personal circumstances and other factors that influence the employability of people in a particular labour market, or at a particular time, and so are fundamental to those people gaining or changing employment" (McQuaid & Lindsay, 2005:194).

Employability is also broadly conceptualised in terms of the different purposes for and perspectives by the individual, the workplace in general or society. Employability can be regarded as:

- (i) a performance indicator (i.e. measuring of graduates' ability to get a job);
- (ii) a commodity (i.e. graduates' ability to respond to the changing needs of a rapidly developing labour market);
- (iii) skills, knowledge and attributes (i.e. a set of skills, knowledge and personal attributes that makes individuals more likely to secure and be successful in their chosen occupation(s) to the benefit of themselves, the workforce, the community and the economy); and
- (iv) meeting employer needs (i.e. employers generally see a graduate's achievements related to the subject discipline as necessary but relatively unimportant for them to be recruited. In such instances, achievements outside the boundaries of the discipline such as the possession of so-called soft skills are generally valued more) (Higher Education Academy, n.d.).

Within this research, employability is regarded as the attributes "required not only to gain employment, but also to progress within an enterprise to achieve one's potential and contribute successfully to strategic directions" (Australia, 2002:3). Employability attributes are those basic capabilities "necessary for getting, keeping and doing well on a job" (Robinson, 2000:1). Wibrow (2011:2) asserts that these capabilities are the foundation of career building blocks and, as such, can be developed. Employability attributes (also refer section 1.2.3.3) include clusters of competences relating to basic academic writing and reading, higher-order thinking inclusive of creative and critical thinking, work readiness, work habits, interpersonal relations, and personal qualities such

as adaptability to changed circumstances (Robinson, 2000:2; Wibrow, 2011:2). Literacy is key to developing these capabilities, and it is often through a literate identity that these attitudes and aptitudes become defined and ingrained in work behaviour.

### 1.5.3 Literacy

The general definitions and views of literacy by global organisations such as UNESCO and as measured by the OECD are described here. In Chapter 2, a conceptual perspective on literacy is developed.

#### 1.5.3.1 Functional literacy

Functional literacy is defined as “the ability to identify, understand, interpret, create, communicate and compute by using printed and written materials associated with varying contexts” (UNESCO, 2005:21). It involves a continuum of learning that enables individuals to achieve their goals and to develop their knowledge and potential so as to participate fully in the community and wider society. In this regard, functional literacy involves the integration of speaking, listening and critical thinking with reading and writing, is intrinsically purposeful, flexible and dynamic, and continues to develop throughout an individual's lifetime (also refer definitions in section 2.1.1).

#### 1.5.3.2 Academic literacy

In institutions of learning, a concept such as academic literacy is used and applies widely. It can be defined as ways of thinking, reading, speaking and writing that are dominant in the academic setting, involving ways of receiving, managing and creating knowledge for the benefit of a field of study (Neeley, 2001).

Weideman (2014) explains that it involves, for example:

- understanding a range of academic vocabulary in context;
- understanding relations between different parts of a text;
- being aware of the logical development of (an academic) text, via introductions to conclusions, and knowing how to use language that serves to make the different parts of a text hang together;
- interpreting different text types (genres), and showing sensitivity for the meaning that they convey and the audience that they are aimed at;
- interpreting, using and producing information presented in graphic or visual format;
- seeing sequence and order;
- doing simple numerical estimations and computations that are relevant to academic information and argument; and

- understanding the communicative function of various ways of expression in academic language (such as defining, providing examples, arguing) beyond the level of the sentence.

### 1.5.3.3 Numeracy and mathematical literacy

Numeracy and mathematical (or quantitative) literacy are increasingly viewed by international bodies such as UNESCO and the OECD as part of a broader conception of key competences for human resource development and lifelong learning (UNESCO, 2013:17). As such, the recognition of numbers and basic mathematical signs and symbols within text is regarded as complementary to language literacy (refer section 2.1.1). Terms such as “numeracy”, “mathematical literacy” and “quantitative literacy” are commonly used in this regard. Although performance on numeracy tasks in international literacy surveys is, in part, measured by the ability to read and understand text, numeracy involves more than applying arithmetical skills to information embedded in text (UNESCO, 2006:150).

Evans (2000:236) offers a working definition of numeracy as “the ability to process, interpret and communicate numerical, quantitative, spatial, statistical, even mathematical, information in ways that are appropriate for a variety of contexts” so as to participate effectively in activities that are valued. Coben (2000:35) adds a dimension of critical judgement and depicts numeracy as being “competent, confident, and comfortable with one’s judgements on **whether** to use mathematics in a particular situation and if so, **what** mathematics to use, **how** to do it, what **degree of accuracy** is appropriate, and what the answer means in relation to the context” [emphasis in the original].

Since information technology permeates the world we live and work in, the concept of numeracy has been broadened to include techno-mathematical literacy. Steen (2001:111) and Coben (2002) define this capacity to communicate and process information in the language created by digital data as literacy. Techno-mathematical literacy is therefore regarded as being anchored in local and global digital work contexts and involves the capacity to perform work in such environments. It encompasses the ability to create, understand and interpret artefacts in a digital context – for example, to represent data in a spreadsheet, chart or graph and critically present on its implications (Hoyles, Wolf, Molyneux-Hodgson & Kent, 2002; Kent, Hoyles, Noss & Guile, 2004).

### 1.5.3.4 Information literacy

Literacy, numeracy and problem-solving in technology-rich environments are key information processing competences that are relevant in many social contexts and work situations, and are necessary for full integration and participation in the labour market, education and training, and social and civic life (OECD, 2014a:25). Workplaces increasingly recognise the value of an information literate workforce who can efficiently use technology to locate, manage and communicate business and other relevant information for effective and

productive work (Katz et al., 2010:135). Information literate workers know when to seek new information, how to seek that information efficiently through technology, how to judge the relevance and reliability of information, how to integrate information to reach new conclusions, and how to use technology to communicate information effectively, clearly and ethically (Katz et al., 2010:135; OECD, 2014b:26).

Thompson and Lathey (2013) regard information literacy as the ability to locate, evaluate and use information in order to “make connections, solve problems, and create innovative ideas that will lead to further information and knowledge” (Montiel-Overall, 2007:58). It is, Oman (2001:34) describes, the ability to organise information so that others can learn and, in a developmental vision put forth by Seeker and Coonan (2011:3), “a continuum that encompasses a broad range of abilities”, inclusive of functional skills and high-level cognitive processes, “culminating in the individual’s capacity to manage his or her own learning.”

All of the concepts and definitions described in this section form part of a broader conceptualisation of workplace literacy in Chapter 2.

### 1.5.5 Technical and vocational education and training

TVET is used as a comprehensive term referring to those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences, and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life. TVET also refers to deliberate interventions to bring about learning which would make people more (or simply adequately) productive in designated areas of economic activity (e.g. economic sectors, occupations, specific work tasks). This is the distinctive purpose of TVET. However, TVET will also have other purposes which also apply to other forms of education, for example knowledge, skills, insights and mind-sets which are deemed to be generally valuable for students and graduates, not only in designated areas of economic activity (Norton, 2013).

In this broad definition by Norton (2013), TVET refers to a range of learning experiences which are relevant to the world of work. The learning experiences may occur in a variety of learning contexts, including educational institutions and workplaces. There are vast differences between the different systems of TVET and their social contexts. In addition, the increasingly complex demands of globalisation, as well as social and economic changes, have significant implications for TVET (refer work of McGrath et al., 2010a, 2010b).

The TVET institutions referred to in this research are the TVET colleges which are constituted as legal entities in terms of the Continuing Education and Training Act, No. 16 of 2006 as amended. The purpose and aim of these colleges are to provide continuing education and training in terms of qualifications and part-qualifications registered at NQF levels 1 to 4. In that, they have to take responsibility for the registration of students, provision

and delivery of the curriculum, and assessment of students. Graduates are therefore defined as students completing their studies at TVET colleges and meeting the requirements to obtain a certificate at the exit-level of the qualifications offered by the colleges.

## 1.6 Research design and methodology

In this section, the design of the research as qualitative content analysis (Mouton, 2001) is grounded in the development of the two conceptual frameworks on workplace literacy. These conceptual frameworks were used to direct a summative content analysis of the curriculum of a selected programme offering at TVET colleges to trace affordances for workplace literacy development.

### 1.6.1 Qualitative content analysis as research design and methodology

Easterby-Smith, Thorpe and Lowe (1991:21) define a research design “as an overall configuration of a piece of research, including what kind of evidence is gathered from where, and how such evidence is interpreted in order to provide good answers to the basic research question.” In this regard, Crotty (1998) provides a scaffolding process to provide the researcher with a sense of direction and stability towards further understanding while expounding upon the research process to suit the research purpose. In Crotty's view, research design commences with research questions that direct research to an epistemological stance and/or theoretical perspective assumptions. These research questions primarily exercise a normative function over methodologies, especially in respect of assumptions regarding knowledge justification (Evers & Lakomski, 2000).

The three research questions in this regard relate to conceptualisations of workplace literacy and development thereof to shed light on such possible developments within a TVET college curriculum and implications for developing the workplace literacy readiness of TVET college graduates. These questions are definitional in nature (Elliott & Timulak, 2005:149), as theorists' and other scholars' conceptualisations and reasoning on literacy were explored in a content analysis (refer Chapter 2) to come to a conceptualisation of workplace literacy (refer section 2.4). In addition, the manner in which literacy is globally assessed and reported on (refer section 2.1) in international surveys and reports, such as the Global Report on Adult Learning and Education (GRALE), the International Adult Literacy Survey (IALS), and the Education for All (EFA) Global Monitoring Report, also informed the conceptualisation and theoretical assumptions in the research. A developmental model on the assimilation of workplace literacy norms by Langer and Knepfelkamp (2001) underpins the conceptual framework for workplace literacy development (refer section 2.6).

Darroch and Toleman (2006) further explain that any research needs to be grounded in and follows a specific research philosophy. The researcher should understand the theoretical and philosophical underpinnings of a

particular research and search for an identity or a research methodology personality in order to be positioned within a specific research paradigm within the research landscape (Darroch & Toleman, 2006). In this regard, Connole (1993) and Durrheim and Terre Blanche (1999) distinguish between three kinds of research paradigms that overlap, namely, empiricist or positivist, interpretive, and critical or constructivist approaches. Connole (1993) previously added a fourth dimension, a deconstructive or post-structural approach.

These paradigms or approaches determine and frame the research methodologies followed. This research design is embedded in critical theory, where learning is posited as an active, constructive process. Alway (1995) describes critical research methodology as the capacity to question the conceptual and theoretical bases of knowledge and method, to ask questions that go beyond prevailing assumptions and understandings, and to acknowledge the role of power and social position in phenomena. The researcher is an information constructor and actively constructs or creates his/her own subjective representations of the objective reality through self-critique and a critical posture on previous beliefs and knowledge (Alway, 1995; Connole, 1993; Durrheim & Terre Blanche, 1999). Furthermore, for a critical methodologist, knowledge is critique and critical social research aims to reveal the underlying practices, their historical specificity and their structural manifestation in the analysis (Harvey, 1990).

In the pursuit to understand, conceptualise and critique workplace literacy for TVET college graduates, relevant theories, views and perspectives on literacy and workplace literacy were critically analysed to come to two conceptual frameworks on workplace literacy and the development thereof (refer sections 2.4 and 2.6). These frameworks present a view of workplace literacy development in a subjective and critical stance on what literacy or literacies are needed to function in the modern-day workplace so as to, in turn, determine opportunities to develop such employability attributes of TVET college graduates.

Critical social research, Harvey (1990) informs, assumes that the world is changed by reflective practical activity. Thus, the researcher is not content to simply identify and research the problem statements, but points to ways in which they can be combated through praxis. The workplace literacy development framework (refer section 2.6) was used for a qualitative content analysis of a college curriculum of one of the vocational programme offerings to determine affordances for workplace literacy development as conceptualised (refer Chapter 3). This was the second content analysis. The content analyses yielded some validation of the conceptual frameworks and their relevance in terms of the research questions. The summative content analysis in Chapter 3 also framed the conceptualisation of workplace literacy development in such a way that it could be used as an analytical tool to determine the extent to which any curriculum creates affordances for such literacy development (refer Chapter 4).

Hsieh and Shannon (2005:1278) define qualitative content analysis “as a research method for the subjective interpretation of the content of text data through the systematic classification process of coding and identifying

themes or patterns." Babbie and Mouton (2001) elaborate that the researcher purposefully tries to unravel the reality of the situation within a certain contextual environment, and the goal of a content analysis is "to provide knowledge and understanding of the phenomenon under study" (Downe-Wamboldt, 1992:314). Any content analysis follows seven classic steps, namely, formulating the research questions to be answered, selecting the sample to be analysed, defining the categories to be applied, outlining the coding process and coder training, implementing the coding process, determining trustworthiness, and analysing the results of the coding process (Elo & Kyngäs, 2008; Kaid, 1989; Kyngäs & Vanhanen, 1999).

Further to their definition, Hsieh and Shannon (2005:1277) identify three approaches to content analysis, namely, conventional, directed and summative approaches. The major differences among these approaches relate to the coding schemes, origins of codes and threats to trustworthiness. In conventional content analysis, coding categories are derived directly from the text data, while with a directed approach the analysis starts with a theory or relevant research findings as guidance for initial codes. Summative content analysis involves counting and comparisons, usually of keywords or content, followed by the interpretation of the underlying context (Hsieh & Shannon, 2005:1277).

The data (i.e. curriculum statements and tasks of a selected college programme) reported here was analysed using qualitative content analysis (Miles, Huberman & Saldaña, 2013), with a particular focus on summative content analysis that Hsieh and Shannon (2005:1283) describe as "... identifying and quantifying certain words or content in text with the purpose of understanding the contextual use of the words or content. This quantification is an attempt not to infer meaning but, rather, to explore usage." However, the analysis does not stop at this point, as qualitative content analysis demands that the analysis go beyond counting the frequency of specific words or content. The further analysis (referred to as latent content analysis) tries to discover the underlying meaning of the content data (Miles, Huberman & Saldaña, 2013), as is evident in the analysis of the affordances for workplace literacy development presented in the intended curriculum for the selected programme, Engineering and Related Design.

Folger, Hewes and Poole (1984) emphasise that the development of a good coding scheme is central to success in research using content analysis, and some of the integrity and trustworthiness of this type of research methodology lie in the coding scheme (Potter & Levine-Donnerstein, 1999). Hickey and Kipping (1996) further urge that content analysis should be guided by a structured process of coding, which means organising large quantities of text into far fewer content categories (Elo & Kyngäs, 2008; Weber, 1990). It includes the process and rules of data analysis to determine patterns or themes directly expressed in the text or derived through analysis (Elo & Kyngäs, 2008; Poole & Folger, 1981). In this instance, the conceptual framework for workplace literacy was used to identify key aspects and elements as coding categories, and thereafter determining the affordances provided in the curriculum documents for such development.

An explanation of how the conceptual framework was used as method and coding scheme in the qualitative content analysis follows in sections 1.6.2 and 1.6.3.2.

### 1.6.2 The conceptual framework as research method

Weaver-Hart (1988:11) explains a conceptual framework as “a structure for organising and supporting ideas; a mechanism for systematically arranging abstractions; sometimes revolutionary or original, and usually rigid.” Rudestam and Newton (1992:6) likewise regard a conceptual framework as consisting of statements that link abstract concepts to empirical data. Punch (2000:54) clarifies that a conceptual framework represents “the conceptual status of the things being studied and their relationship to each other.” May (1993:20) further suggests that crafting a conceptual framework can be viewed as providing a systemic theoretical overview of the intended research, order within that process and how to make sense of the research findings.

May (1993) regards theory (and subsequent conceptualisation) as significantly central to the research process and the researcher’s maturation process. Cohen, Lawrence and Morrison (2000:13) explain that “concepts enable us to impose some sort of meaning on the world; through them reality is given sense, order and coherence. They are the means by which we are able to come to terms with our experience.” Robson (1993:150–151) elaborates by proposing that:

[developing a conceptual framework] forces you to be explicit about what you think you are doing. It also helps you to be selective; to decide which are the important features; which relationships are likely to be of importance or meaning; and hence, what data you are going to collect and analyse.

A conceptual framework therefore fulfils two roles: firstly, it provides a theoretical clarification of what researchers intend to investigate, and secondly, it provides readers with clarity on what the research seeks to achieve and how that will be achieved (Leshem & Trafford, 2007:99).

In a complementary view, Maxwell (1996:25, 37) argues that a conceptual framework, like the theory it represents, is a picture of the territory the researcher wants to study, not of the study itself. It is a visual display of the researcher’s current working theory – a picture of what he/she thinks is going on with the phenomenon under study. A similar approach, posited by Glatthorn (1998:87), is to portray and visually represent concepts of phenomena and their relationships in a flowchart, web diagram or other type of schemata. This approach allows for the conceptual framework to emerge from naturalistic research due to the grounding of data, which gives rise to theory (Strauss & Corbin, 1990). However, Blackmore and Ison (1998:52, 55) provide an opposing view, suggesting that the systems, Venn diagrams and conceptual modelling rather shape how the data is interpreted and conceptualised.

Regardless of these contestations, Leshem and Trafford (2007:99) assert that conceptual frameworks provide a scaffold within which strategies for the research design can be determined and fieldwork can be undertaken. Conceptual frameworks shape how research conclusions are presented and provide traceable connections between theoretical perspectives, research strategy and design, fieldwork, and the conceptual significance of the evidence. Therefore, the conceptual framework acts as “a bridge between paradigms which explain the research issue and the practice of investigating that issue” (Leshem & Trafford, 2007:99).

In this research, the conceptual frameworks for workplace literacy and workplace literacy development served both as method for and result of the qualitative content analyses. The extensive literature analysis of perspectives and views on literacy, ranging from narrow autonomous and skills-driven perspectives to ideological views and stances, formed the basis for the conceptual framework on workplace literacy, while a developmental model on the assimilation of workplace literacy norms by Langer and Knefelkamp (2001) underpins the framework on workplace literacy development. The main concepts of the workplace literacy development framework were subsequently described to serve as coding categories for the qualitative content analysis of the curriculum documents of the selected programme to determine affordances for such literacy development (refer section 1.6.4.2).

A description of the selection of the content for the qualitative content analysis and the coding of the literacy development aspects for analysis follow in the next section.

### **1.6.3 Selection of the content for the summative content analysis**

In this section, the background and rationale for selecting the Engineering and Related Design programme are discussed, followed by an overview of the coding and description of categories for the summative content analysis.

#### **1.6.3.1 Background and rationale for selection of the TVET college programme**

The programme used for the summative content analysis was the NCV programme Engineering and Related Design. This NCV qualification<sup>4</sup> was developed as a vocational qualification in line with NQF qualification design and registered at levels 2 to 4. It was implemented in colleges in 2007 (refer section 1.2.1) with substantial support from the then Department of Education. The Department of Higher Education and Training is still the

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<sup>4</sup> The NCV qualification was reviewed by Umalusi and the final report concluded in 2017.

custodian of the qualification and assessment body in respect of national examinations and certification for this qualification, while Umalusi is the quality council for the NCV.

The qualification, with 19<sup>5</sup> vocational programmes, consists of three fundamental subjects (English, Mathematics or Mathematical Literacy and Life Orientation) and four vocational core subjects, of which three are prescribed and one is an elective for specialisation in the particular vocational field denoted by the programme. The qualification is a three-year qualification and is implemented as such. However, there is certification in each year and students are not prohibited to exit after a year.

Both the curricula<sup>6</sup> of the Report 191 and NCV qualifications are forward-designed. This design, as explained by Richards (2013), starts with syllabus planning, moves to methodology, and is followed by assessment of learning outcomes. The subject syllabi in the case of Report 191, and the subject and assessment guidelines of the NCV programmes contain the selected concepts, knowledge and skills for specific vocational fields. However, in contrast to the Report 191 syllabi, the newer NCV guidelines map out teaching and learning and assessment activities, the desired standard for performance and the resourcing required for delivery. In both cases, the assessment of students is based on norm referencing; that is, students are graded on a single scale with the expectation that they spread across a wide range of scores or that they conform to a pre-set distribution (Richards, 2013:8–9). In addition, more particularly for NCV programmes, textbook development is initiated by the Department and approved textbooks are published in a catalogue. Curricula for other programme offerings, such as the occupational programmes, are also forward-designed, though the control over their implementation resides with the accreditation authorities which, because of delegation by the Quality Council for Trades and Occupations, are the different SETAs.

The forward design of the NCV curricula is one of the reasons for choosing this programme for the qualitative content analysis. The intended curriculum, as contained in the subject and assessment guidelines of six subjects of the Engineering and Related Design programme (refer further explanation in section 3.1), could therefore be analysed in terms of the affordances for workplace literacy development. Other reasons for this selection are:

- (i) I chose a programme without an obvious 'literacy' bias. In this sense, it could be tested whether ample opportunity for workplace literacy development exists even in programmes where reading and working with documents (a popular notion of literacy) would not be assumed to be part of the

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<sup>5</sup> This is the number as at 28 March 2018.

<sup>6</sup> Curriculum takes content (from external standards and local goals) and shapes it into a plan for how to conduct effective teaching and learning. It is thus more than a list of topics and lists of key facts and skills (the "input"). It is a map of how to achieve the "outputs" of desired student performance, in which appropriate learning activities and assessments are suggested to make it more likely that students achieve the desired results (Wiggins & McTighe, 2006:6).

curriculum content as would be the case in programmes such as Office Administration or Financial Accounting and Management.

- (ii) Since a primary focus of TVET colleges has been identified as artisan development (South Africa, 2011; South Africa, 2013c; South Africa, 2015a), I wanted to choose a programme with an obvious artisanal focus. Engineering and Related Design is such a programme and also provides a route to a trade test.
- (iii) Engineering and Related Design is one of the 19 programmes in the NCV qualification. It was one of those heavily criticised in terms of curriculum design flaws, poorly written outcome statements and curriculum writers that were not always skilled in writing curricula. I wanted to determine whether, even within a “flawed” curriculum, opportunity for workplace literacy development could exist.
- (iv) As mentioned in section 1.2.2.1, NCV and Report 191 (NATED) qualifications are both state-funded and currently the main offerings in TVET colleges. As such, NCV programmes appear on the register of ministerial approved programmes. Engineering and Related Design is one of the 19 funded programmes in the NCV qualification and therefore has substantial student enrolment.
- (v) I chose a programme in the NCV qualification as its qualification design is in line with the outcomes-based approach of the NQF and it is not a part-qualification such as Report 191. Furthermore, new occupational programme development (offering of which is a strategic direction for colleges) is also more similar in design to NCV than Report 191.

In the next section, I describe how the categories for the content analysis were derived and coded, as well the method followed for analysis.

### 1.6.3.2 Coding and description of the categories for the summative content analysis

For the conceptualisation of development of workplace literacy, I selected a developmental model by Langer and Knefelkamp (2001) for the assimilated and progressive uses of workplace literacy. The Langer and Knefelkamp model traces the development of workplace literacy and assimilation of workplace norms in five stages, progressing from concept recognition regarding which literacies are demanded in the workplace, to mastery thereof in order to function capably and attain professional independence (refer explanation in section 2.6.1). Similarly, although workplace literacy development has been conceptualised in this research in terms of developmental layers that evolve as literacy capability develops, the development is not linear. The main aspects of literacy development for the analysis are: concept recognition of the literacies required for college and work, functional application of multi-literacies in multiple contexts (integration and application), manifestation of literacy capabilities and a literate identity, and independent literate behaviour to apply literacy critically and creatively for purposes of personal and work transformation.

Each category of literacy practice and assimilation in a layer was defined and described in line with the conceptualisations of workplace literacy and development thereof (refer sections 2.4 and 2.6). Questions were formulated in terms of what would be asked of the curriculum so as to determine the affordances provided for workplace literacy development. The questions in turn determined the sub-categories used for the analysis. These sub-categories relate to the elements of the literacy practice and assimilation thereof.

As a case in point, the content analysis conducted was to reveal whether there are affordances for development of workplace literacy while students are at TVET colleges, and in what manner these affordances or favourable environments relate to actual workplace literacy practices and would benefit students' transition to such workplaces. Affordances are defined by Gibson (1977) as conditions in the environment for constraints (e.g. situational types such reading a text) to which the agent is attuned. Affordances therefore refer to the potentialities and constraints of different modes – what it is possible to express and represent or communicate easily with the resources of a mode, which could be materially, culturally, socially and historically developed ways in which meaning is made (Kress, 2010). From this perspective, the term “affordance” is not a matter of perception, but rather refers to the opportunity for workplace literacy development as traced and interpreted in the curriculum documents. For example, there are affordances detected for developing critical reading capability and behaviour (workplace literacy element) in a subject outcome statement such as “Critically read/view multimodal forms of communication and formulate insightful responses to the intended meaning.”

As explained in preceding sections, the affordances for workplace literacy development were traced and interpreted in the sections of the subject and assessment guidelines (refer section 3.1 for detailed explanation) and recorded as instances. An instance is a unit of measure in the document analysis and indicates an affordance for workplace literacy development in that an example or occurrence of a workplace literacy element was detected. In the detection and analysis of these instances, context and co-text were taken into account – I searched contextually for key words (mainly verbs) and phrases that relate to the elements of an aspect of workplace literacy development (e.g. concept recognition), but also considered co-textual influences – for example, the word “texts” could only appear as a reference to an actual text such a Word document, job contract or a statistical sample. The affordance was underlined and the instance recorded as a count (refer Chapter 3 and Annexure B). The quantification of the instances was solely to determine the weighting attached to the layers of workplace literacy development within the different subjects and to draw some comparisons between the opportunity for workplace literacy development in the fundamental and core subjects.

As a consequence of the interrelation and coexistence of the different layers (aspects) of workplace literacy development (refer conceptualisation in section 2.6), one instance could possibly denote more than one layer of workplace literacy development. For example, subject outcome 1.1 in the English Additional Language subject guidelines, “Listen and respond critically in diverse contexts for a variety of purposes”, is categorised under

“concept recognition”. No doubt, in order to achieve this outcome, a student would need to recognise certain concepts. However, they would only be able to do so by applying their listening and responding skills in a particular functional context (“in diverse contexts for a variety of purposes”), which would fall under “integration and application of functional literacy practices”. The stipulation that the student is required to respond “critically” would indicate a level of mastery which links to the third developmental layer, “mastery of capabilities” and the fourth, “critical and creative literacy behaviour”. Many of the outcomes can thus be achieved in different ways with a focus on different developmental aspects, particularly in language education where the modalities of reading and viewing, writing and presenting, speaking, listening and thinking are so integrated and mutually constitutive. In such cases, instances could be recorded at more than one level.

Since the analysis was done in terms of written text as contained in the different subject curriculum documents, it emerged as some form of discourse analysis and subjective interpretation. Discourse in this sense is regarded as an organisation of text that “does something, in the broad social world, or in the immediate interaction, or in both” (Antaki, 2008:2). In this case, it meant working with what was actually written in curriculum documents, while exploring and analysing the patterns in and across the various subject and learning outcomes and assessment standards statements (Phillips & Jorgensen, 2002:21) so as to determine the affordances for developing workplace literacy.

The guiding questions and content analysis findings are elaborated upon in sections 3.2 and 3.4. The detailed analysis is attached as Annexure B. However, it should be noted that neither the categories (aspects) nor the coding descriptions were regarded as watertight and I remained open to the possibility of other aspects or elements of workplace literacy to emerge when conducting the content analysis.

## 1.7 Ensuring quality in research design

Normally, empirical research has to adhere to quality control concepts like reliability and validity (for quantitative studies) and credibility and trustworthiness for qualitative studies. Lincoln and Guba (1985) developed quality criteria for research using qualitative data. These criteria include:

- (i) confirmability (i.e. the extent to which the researcher has allowed his/her own values to influence the research, akin to objectivity);
- (ii) dependability (i.e. the extent to which the findings could apply at other times, akin to reliability);
- (iii) credibility (i.e. how believable the findings were, akin to internal validity and trustworthiness); and
- (iv) transferability (i.e. the extent to which the findings could apply to other contexts, akin to external validity).

Tracy (2010:840) adds some more dimensions to consider in such research that link and overlap with Lincoln and Guba's quality criteria. These dimensions include doing research on a worthy topic while ensuring that the research is richly rigorous, credible and demonstrating resonance across various perspectives and audiences. The research should also be sincere and significant in terms of making a contribution on a range of levels (e.g. theoretical, practical, ethical, methodological), coherently written and holistically ethical.

How the quality of this research measures up in terms of the above-described criteria and dimensions is discussed with regard to objectivity and sincerity of perspectives, reliability, trustworthiness and credibility, and validity of the research methodologies and findings.

### 1.7.1 Confirmability (Objectivity)

Confirmability is the degree to which the research findings can be confirmed or corroborated by others. It is analogous to objectivity, that is, the extent to which a researcher is aware of or accounts for individual subjectivity or bias (Guba & Lincoln, 1994; Lincoln & Guba, 1985; Tracy, 2010). Searle (1999) argues that auditing, in which the researcher provides a methodological self-critical account of how the research was done, could also be used to establish objectivity. In order to make auditing by other researchers possible, it is a good idea for the researcher to archive all collected data in a well-organised, retrievable form so that it can be made available to other researchers if the findings are challenged.

Phillips and Jorgensen (2002:173) similarly argue that any discourse analysis should be solid and comprehensive. The questions posed to the text should be answered fully and any textual features that conflict with the analysis should be accounted for. The analysis should also be presented in a transparent way, allowing the reader, as far as possible, to 'test' the claims made. This can be achieved by documenting the interpretations made and giving the reader access to the empirical material, or at least reproducing longer extracts in the presentation of the analysis.

Subjectivity and sincerity can be traced in my "insider perspectives", especially in Chapters 1 and 4, and the fact that a TVET college curriculum was selected for the qualitative content analysis. This research was in part sparked by personal interest, which may have impacted on objectivity (i.e. the extent to which my own thoughts, ideas and values were allowed to influence the research). Furthermore, the use of the model of Langer and Knefelkamp (2001) presupposed conceptual thinking in terms of the developmental and acculturation stages of workplace literacy. The content analysis of the curriculum documents, because one reads and interprets written text, could have opened up subjective interpretation to some extent. Furthermore, poorly written outcome statements or broad and bland statements of assessment tasks (e.g. written test), especially in the core subjects, resulted in subjective interpretation having to be made in order to record instances.

The discussion and interpretation of the findings ensured comprehensiveness. Attaching these findings and explanatory notes as annexures allowed for transparency and interpretations to be tested. The curriculum documents are readily available should any findings require auditing and verification.

### 1.7.2 Dependability (Reliability)

Dependability is analogous to reliability, that is, the consistency of observing the same finding under similar circumstances (Guba & Lincoln, 1994; Lincoln & Guba, 1985). Researchers search for convergence among multiple and different sources of information to eliminate bias and increase their truthfulness (Creswell & Miller, 2000:126). Dependability can be traced in the rigour applied to ensure a suitable theoretical basis, appropriate methods and sufficient data. Graneheim and Lundman (2004) and Elo and Kyngäs (2008:112) further suggest that, to increase the reliability of the research, the researcher must aim at a clear description of the context, selection and characteristics of the sample, data collection and process of analysis when reporting the results.

An extensive literature analysis of perspectives on literacy informed the framework development (refer Chapter 2), which in turn ensured a reliable theoretical basis for the qualitative content analysis – the research design. The conceptual framework for workplace literacy development (refer section 2.6) was simplified and used to trace the affordances for literacy development in a reliable manner (Kyngäs & Vanhanen, 1999). Furthermore, consistency in analysis was ensured by applying the method of analysis rigorously – the same questions were posed to identify and trace the aspects and elements of workplace literacy development in each of the curriculum documents. This rigorous process simultaneously enabled better description of the aspects and elements of workplace literacy.

However, I concede that using analysis of outcome statements in the subject guidelines and even the verbs used in these statements perhaps narrowed the analysis. One outcome could potentially relate to more than one element of workplace literacy development (refer example in section 1.6.3.2), and using outcomes gave a restricted view of the potential – when this curriculum is enacted, the learning and assessment tasks may pan out differently. For example, a statement with a verb such as “fit” in “fit machine tools to meet machine specifications to enable machining of the product” implies that students should be able to correctly set up or configure the computer-aided machining process. The assumption is that students will engage in digital texts and tasks to do so, but there is no clear link in the outcome to literacy development. Similarly, in the use of verbs such as to “explain” or “define” concepts, the link to a literacy practice may be vague, whereas in the enacted practice, the student may use a manual, presentation or even illustration to define and explain and, within the application of these practices, develop literacy capability.

In addition, adequate description of the aspects and elements of workplace literacy and the variety of questions asked ensured reliability in tracing the affordances thereof in the curriculum documents. These descriptions and

detected instances enabled the collection of valid and reliable data so that the inferences that were drawn from the data (refer Chapters 3 and 4) would be defensible (Creswell & Miller, 2000:124; Weber, 1990).

### 1.7.3 Trustworthiness (Credibility)

Golafshani (2003:604) argues that reliability and validity are conceptualised as trustworthiness, rigour and quality in a qualitative paradigm. Thus, credibility relates to the extent to which the data and data analysis are believable and trustworthy and is regarded as analogous to internal validity, that is, how research findings match reality (Guba & Lincoln, 1994; Lincoln & Guba, 1985). Creswell and Miller (2000:125) explain the reality to be relative to the meaning that people construct within social contexts and validity procedures present criteria with labels such as trustworthiness and authenticity. These criteria are represented by fairness, credibility, transferability, dependability and confirmability in research, and their application enlarges personal constructions, leads to improved understanding of constructions of others, and stimulates and empowers action (Creswell & Miller, 2000:126).

This research is regarded to have some elements of constructivist design because of the development of conceptual frameworks for workplace literacy development and proposing an evaluation instrument for workplace literacy readiness in Chapter 4. Furthermore, as described in sections 1.6.3 and 1.7.2, the categories for the content analysis were derived from the two conceptual frameworks which emerged from a focused and extensive content analysis of literature on literacy. However, although the broadly defined aspects and elements of workplace literacy development were used as code for the summative content analysis, there was an openness to other aspects or elements emerging during the content analysis, thereby constituting an element of confirmability.

Folger et al. (1984) and Elo and Kyngäs (2008:112) emphasise that the integrity and trustworthiness of qualitative data are found in a good coding scheme and analysis process. Results should be described in sufficient detail so that readers have a clear understanding of how the analysis was carried out, as well as its strengths and limitations, thereby demonstrating the reliability of the findings and interpretations. Sections 1.6 and 3.2 describe in detail the research design and the summative content analysis conducted to trace the affordances for workplace literacy development provided in the intended curriculum documents of the selected programme. The same workplace literacy aspects and elements were used in the proposed instrument to evaluate the extent to which any curriculum creates affordances for workplace literacy development and readiness, thereby signifying transferability and resonance (Tracy, 2010). The coherent description that is evident in the structural layout of the thesis and the adequate cross-referencing further ensured the trustworthiness of findings and interpretations.

### 1.7.4 Transferability (Validity)

Research findings are transferable only if they fit into new contexts outside the actual research context. Transferability is analogous to external validity, that is, the extent to which findings can be generalised (Guba & Lincoln, 1994; Lincoln & Guba, 1985). External validity and transferability in this research are not only found in the choice of a worthy and relevant topic and the significance of the research contribution, but also in the richness generated through a “requisite variety” (Weick, 2007:6) of theoretical constructs, data sources, contexts and samples. The chosen problem statement of the research – namely, employability of graduates, and more so of TVET college graduates – is a contemporary and contentious discourse (refer discussion in section 1.2). The significant contribution of the research is discernible in a very specific conceptualisation of workplace literacy and development thereof in a TVET college context (refer Chapter 2) to mean more than knowing how to work or being employable through being literate. Postulated in an ideological perspective, the conceptualisation moves away from regarding literacy as skills modules, or in terms of subject content to be taught and assessed, although there is a developmental aspect. This conceptualisation was framed in such a way that it could be used as an analytical tool to determine the extent to which any curriculum creates affordances for workplace literacy development and readiness – these are spelled out as implications in Chapter 4.

## 1.8 Structure of the research

The structure and outline of the research are as follows:

- Chapter 1: Orientation to the research – this chapter provides an overview to the research, inclusive of the background to TVET colleges and employability, the problem statement and research questions, and the methodology followed.
- Chapter 2: Distilling workplace literacy development within a conceptual framework – this chapter contains the conceptualisations of workplace literacy and how it should be developed at TVET colleges.
- Chapter 3: Validation of the conceptual framework of workplace literacy development – this chapter presents a summative content analysis of the curriculum of a college programme conducted in line with the conceptual framework for workplace literacy development.
- Chapter 4: Implications for developing workplace literacy readiness – in conclusion, an evaluation instrument for workplace literacy development is attempted and implications for implementation are discussed.

## 1.9 Conclusion

In this chapter, the background and history of TVET colleges (refer section 1.2.1), which contribute to the employability challenges graduates of these colleges face, were described. These challenges (refer sections 1.2.2.1–1.2.2.4) relate to the responsiveness of college curriculum, the framework for skills development in South Africa, the work readiness of graduates and their transition to the workplace. Perspectives on employability, and modern-day work environments and work further contribute to understanding of the full context of the problem statement and research. Employability (and unemployment of the youth in general), for which this research proposes some solution in the form of workplace literacy development, is a critical problem globally, in South Africa and in the TVET college context particularly. I discuss the conceptualisation of workplace literacy and how it should be distilled in TVET colleges next in Chapter 2.

## CHAPTER 2: DISTILLING WORKPLACE LITERACY DEVELOPMENT WITHIN A CONCEPTUAL FRAMEWORK

- 2.1 Introduction
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  - 2.6.4 Mastery of workplace literacy capabilities and manifestation of a literate identity
  - 2.6.5 Critical and creative literate behaviour
- 2.7 Conclusion

## 2.1 Introduction

The concepts and perspectives on literacy, as well as the global measurement thereof, are explored in this section. This is done to define workplace literacy and conceptualise its development. A skills-based approach to literacy as well as an ideological view of literacy as situated and sociocultural practice, as multi-modal capabilities, and as critical and transformative power are critically reflected upon to conceptualise workplace literacy. The latter concept is further explored in terms of its significance for lifelong learning and work so as to argue its importance for graduate employability.

### 2.1.1 Towards defining literacy

Literacy as concept has proven to be both complex and dynamic, and continues to be interpreted and defined in a multiplicity of ways. A few decades ago the term hardly featured in formal education discourse; instead, research centred on reading (Lankshear & Knobel, 2003). Even today, notions of what it means to be “literate” or “illiterate” are influenced by a wide array of factors, including academic research areas, institutional agendas, national context, cultural values and personal experiences. Over time, theories of literacy have evolved from those focused solely on changes in individuals’ engagement with texts to more complex views encompassing the broader social contexts (i.e. the “literate environment” and the “literate society” – refer Olson & Torrance, 2001, 2009) that encourage and enable literacy activities and practices to occur. Understandings in the international policy community have expanded too – from viewing literacy as a simple process of acquiring basic cognitive skills to views of literacy contributing to socio-economic development, social awareness and critical reflection to effect personal and social change (UNESCO, 2006:147). These later perspectives on literacy are strongly reflected in international reports and assessments such as the GRALE<sup>7</sup>, the IALS and the EFA Global Monitoring Report to name but a few (refer section 2.1.2).

As said, while the concept of literacy has evolved over time, no global consensus on the definition has emerged. Terms such as “literacies”, “literacy practices and events”, “basic literacy”, “advanced literacy”, “functional literacy” and “post-literacy” are used with widely different, and sometimes unclear, meanings in policy, programme and academic contexts (UNESCO, 2006). As a result, the term came to signify more than skills and competences associated with contexts and texts (oral and written) where language is used for meaning-making. Some scholars even prefer the use of the term “literacies” to refer to the multiple ways of meaning-making and reading of the world in different contexts (refer Cazden et al., 1996; Cope & Kalantzis, 2000; Kalantzis, Cope &

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<sup>7</sup> At the sixth International Conference on Adult Education, member states committed to reporting every three years on the development of adult learning and education, and they called on UNESCO to produce the GRALE at regular intervals.

Harvey, 2003; Lankshear & Knobel, 2003). For example, technological advancement contributed a plethora of concepts and terms such as “information literacy”, “technological literacy”, “visual literacy” and “media literacy” (UNESCO, 2006). Moreover, numeracy, as mediated by written material (but not oral numeracy), has officially been added as a complement to or a component of literacy by international organisations such as UNESCO and the OECD (UNESCO, 2013). In addition, as most people live in multilingual contexts or have a migrant background, multilingualism has become increasingly important in any conceptualisation of literacy.

UNESCO to date has offered operational definitions<sup>8</sup> of what constitutes a “literate” person. In 1958, member states of UNESCO (2013:20) proposed that “a person is literate who can, with understanding, both read and write a short simple statement on his or her everyday life<sup>9</sup>.” In 1978, the definition was revised to define functional literacy<sup>10</sup> as “a person is functionally literate who can engage in all those activities in which literacy is required for effective functioning within his or her group and community and also for enabling him or her to continue to use reading, writing and calculation for his or her own and the community’s development” (UNESCO, 2013:20).

Another operational definition of literacy came into practice in 2005 and is still used today in global reporting on and assessment of literacy. This definition attempts to address the need to define the skills required for productive work and employment. This definition outlines literacy as “the ability to identify, understand, interpret, create, communicate and compute by using printed and written materials associated with varying contexts” (UNESCO, 2005:21). Literacy in this regard involves a continuum of learning to enable individuals to achieve their goals, develop their knowledge and potential, and participate fully in community and wider society (UNESCO, 2005:21).

The 2005 definition of functional literacy was further refined and adopted by UNESCO (2010) member states in the Belém Framework for Action, which identifies key elements for understanding literacy today. These elements include understandings of (UNESCO, 2010):

- (i) literacy as a continuum of learning;
- (ii) sustainable literacy as a target;

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<sup>8</sup> Both these definitions have been framed within education statistics, so they are mostly operational definitions for measurement purposes.

<sup>9</sup> UNESCO’s 1958 literacy definition does not specify what is meant by “a simple statement” and “everyday life” (each individual’s everyday life is unique), and does not cover numeracy.

<sup>10</sup> UNESCO’s 1978 literacy definition is still widely used. The notion of “functional literacy” has been heavily criticised as instrumental and biased towards economic activity. It is argued that there is no need for such a qualifier since literacy is always “functional” as it equips people with skills that allow them to function.

- (iii) literacy as an empowering tool that enables participants to continue as lifelong learners; and
- (iv) an enriched literate environment as essential support for continuing education, training and skills development beyond basic literacy skills.

From these internationally adopted notions of literacy, it is clear that literacy learning and manifestations thereof in behaviour are continuous, context-bound processes that occur both within and outside of educational settings and continue throughout life (UNESCO, 2013). How such literacy development is globally assessed is presented in the next section.

### 2.1.2 Global perspectives on literacy development and measurement

Literacy, Kirsch (2001:4) alerts, is no longer seen as an:

ability that is developed during the early school years, but is instead viewed as an advancing set of skills, knowledge, and strategies that individuals build on throughout their lives in various contexts, through interaction with their peers and with the larger communities in which they participate.

Consequently, it is recognised that literacy does not “relate to some arbitrary standard for the purpose of categorizing people as literate or illiterate”, but should be measured as one’s understanding, evaluation, usage and engagement with printed and written information so as to participate in society, achieve one’s goals and develop one’s knowledge and potential (Kirsch, 2001:5–6).

Moreover, people engage in literacy behaviours for a variety of uses or purposes (Cook-Gumperz, 2006; Diehl & Mikulecky, 1980; Heath, 1983; Kirsch, 2001:6–7). These behaviours vary across contexts (refer Heath, 1983; Venezky, Wagner & Ciliberti, 1990) and even among people within the same context (refer Kirsch & Guthrie, 1984). Such variations lead to an interaction with a broad range of materials that have qualitatively different linguistic forms as a result (Diehl & Mikulecky, 1980; Miller, 2008, 2010). In some instances, different types of literacy tasks have even been associated with different cognitive strategies or reading behaviours (refer Crandall, 1981; Kirsch & Guthrie, 1984; Scribner & Cole, 1981; Sticht, 1978, 1982).

Given that literacy is not used for a single purpose and that literacy texts are not similar in every context, global measurements of literacy attempt to determine what being literate constitutes and what that means in terms of educating and training citizens for productive work (Murray, Kirsch & Jenkins, 1998; Thorn, 2009). Literacy is therefore popularly organised and measured in global surveys and measurements, e.g. the Adult Literacy and Lifeskills Survey, the IALS and the Programme for the International Assessment of Adult Competencies, in three domains, namely, prose, document and quantitative literacy. Prose literacy refers to the ability to understand and use information from different texts, such as editorials, news stories, poems and fiction; document literacy

means the ability to locate and use information from various documents, such as job applications, payroll forms, transportation schedules, maps, tables and graphs; and quantitative literacy is understood as the ability to perform arithmetic functions, for example balancing a budget, calculating a tip or completing an order form (Kirsch, 2001:9; Krahn & Lowe, 1998:2; Murray et al., 1998:17). Later surveys have added problem-solving in technology-rich environments as a dimension to the usual measurements of literacy and numeracy. This measurement focuses on using digital technology, communication tools and networks to acquire and evaluate information, communicate with others, perform practical tasks, and solve problems for personal, work and civic purposes (OECD, 2014b:26).

Moreover, literacy and numeracy levels have been explicitly recorded and defined in national qualifications frameworks because of notions of literacy as instrumental in work and for employability or employment (Allais, 2014; Allais & Nathan, 2012). In this regard, Allais (2014) and Allais and Nathan (2012) explain that a scale of different levels of literacy – levels of baseline, functional and multiple literacy – has been established within these qualification frameworks. Baseline literacy means the ability to read and write at a level that enables self-confidence and motivation for further growth and development, while functional literacy is regarded as the ability to read and write at a level that enables development and functioning in society at home, school and work. Multiple literacy is defined as the ability to use reading and writing skills in order to produce, understand, interpret and critically evaluate multi-modal texts. The latter has been identified as the minimum threshold that enables people to meet the requirements for lifelong learning (UNESCO, 2013:26).

In conclusion, a uniform and commonly-agreed definition of literacy and approach to measurement of literacy development remain contested. UNESCO (2013:22) summarises the five main scholarly approaches to literacy which globally affect views and perspectives on literacy. Literacy is regarded as:

- (i) skills, particularly the ability to read, write and calculate, sometimes called cognitive skills or a set of cognitive processes;
- (ii) applied, practised and situated, or as tasks that require the written word, such as functional, family and work-based literacy;
- (iii) a set of social and cultural practices embedded in specific socio-economic, political, cultural and linguistic contexts, including school, family and community contexts;
- (iv) capabilities reflected in the ability of individuals using these skills to achieve their communicative goals and purposes; and
- (v) a tool for critical reflection on and action for social change, also referred to as critical or transformative literacy.

These main approaches to literacy are explored in the next sections in an overview of how understandings and conceptualisations of literacy, and particularly workplace literacy, developed. These perspectives further underpin my own conceptualisation of workplace literacy and development thereof for the TVET college graduate (refer conceptual frameworks in sections 2.4 and 2.6).

## 2.2 Overview of the understandings of literacy

In this section I discuss the two main paradigms with related perspectives regarding literacy – a skills-based approach to and an ideological view of literacy.

### 2.2.1 A skills-based approach to literacy

The most common understanding of literacy is that it is “a set of tangible skills – particularly the cognitive skills of reading and writing – that are independent of the context in which they are acquired and the background of the person who acquires them” (UNESCO, 2006:149). These earlier definitions of literacy, an “autonomous” view of literacy in Street’s (1984) terms, establish literacy as an abstract set of reading and writing skills or abilities that are developed or acquired independently of any context. This so-called individual cognitive toolbox with reading and writing skills, as Graff (1982, 1987a) puts it, enables the individual (or literate) to engage effectively in all those activities in his/her culture or group where literacy normally plays a role. As such, reading and writing serve literacy as a bare mechanical minimum to fulfil roles as family and community members, job-holders and citizens (Decarie, 2010:310) and are deemed necessary to thrive and not merely survive in a context or culture, Cervero (1985:51) concludes.

As highlighted, these earlier definitions tend to focus on one’s cognitive ability to encode and decode texts (i.e. the acts of writing and reading), resulting in what Scribner and Cole (1981) term the “Great Divide.” Great Divide theory with its main proponents being Goody and Watt (1988), Ong (1977, 1982) and Olson (1977) distinguishes between oral and written traditions of language use in pre-literate and literate cultures and societies. In such an approach, it is postulated that literacy (reading and writing per se) contributes to higher-order thinking and cognitive skills (Kelder, 1996:4). These premises are based on the difference in meaning-making in the oral traditions of pre-literate cultures and the reading and writing practices of literate societies. In an oral tradition, meaning is context-specific and embedded in the concrete events and shared meanings of the present moment. On the other hand, internalisation of meaning and development of thought are fostered over time in writing and reading practices (Goody & Watt, 1988:18). Meaning is therefore contained and locked in text and the purpose of reading becomes to unlock meaning. Olson (1994:177) further adds that “writing and reading played a critical role in producing the shift from thinking about things to thinking about representations of those things.”

However, Great Divide thinking wrongfully ignores the ability and contributions in terms of abstract thinking and theorising by pre-literate societies. For example, Mesopotamian astronomers (5000–3500 BC) used advanced mathematics to follow and predict the movements of the stars, planets and the moon. This required logic, mathematics and scientific process, all of which involve high-order thinking and cognitive skill (Ancient Mesopotamia, n.d.). Madden, Palimi and Bryson (2005:41) also demonstrate that information roles in a pre-literate society such as the Kope Tribe of Papua New Guinea, namely, induction, dissemination, presentation, organisation and preservation, have parallels in literate societies, albeit “some of these roles are more effectively performed when text is available.” They also concede that adoption of text gave society a valuable tool for organising, disseminating and preserving information, thereby making these cultures more robust and durable than wholly oral cultures which are reliant on rituals and memory.

It cannot be disputed that the transition from oral to written modes had a fundamental impact on human consciousness by allowing for the representation of words by signs and providing a critical framework within which to think analytically (Madden et al., 2005; UNESCO, 2006). In this regard, much of the research and discourse continues to focus on the acquisition of skills, particularly reading competencies. Some scholars advocate phonetic approaches to reading and phonological awareness training (refer Abadzi, 2004; Royer, Abadzi & Kinda, 2004), while others favour “reading for meaning” (UNESCO, 2006:149), which has led to research in cognitive sciences in respect to the important features of human memory, for instance how the brain processes reading patterns.

Over time, new perspectives brought about changed views of literacy, even in a skills-based approach. One such conceptual shift was provided by sociolinguistic voices (e.g. those of Bernstein, 1972; Cook-Gumperz, 1986, 2006; Heath, 1983; Hymes, 1972, 1974) that began to regard literacy as a sociocultural and situated practice in a more ideological view (refer section 2.2.2). Cook-Gumperz (2006:3), a major voice in this regard, dispels the notion of literate and oral practice to be considered as opposites and argues that “literacy and orality coexist within a broader communicative framework” as different ways of achieving the same communicative ends. Oral and written features in language practices are therefore inextricably linked and mixed. For example, an activity that requires a literacy practice, such as writing when completing a tax return/form, may also necessitate engagement in oral practice when speaking to a tax consultant (Robinson-Pant, 2008).

Fagan (2001:para. 8) also broadened a skills-based understanding of literacy to a more functional view of literacy and explains literacy as behaviour that is dependent on the acquisition of skills. However, literacy behaviour does not equal skills; it merely is a result of – and effective because of – skills. Reading and writing are skills that underpin and result in literate behaviour, in other words, the meaningful interaction with the printed word in a distinct context (Decarie, 2010:311). But, Fagan (2001:para. 19) concludes, “what really matters is the behaviour and the engagement within a context or culture by using skills appropriately for a specific purpose.”

Fagan (2001:para. 8) continues that literacy behaviour has “educational, social, economic, and political overtones” and contributes to socio-economic development. As such, literacy gets measured as abstract, cognitive skills against normative standards and criteria determined by governments and educational institutions, thereby resulting in categorising individuals in varying degrees of literate and illiterate. Opposing voices (refer Baker & Street, 1991:360–362; Druine & Wildemeersch, 2000:391; Graff, 1987b) caution that such productivist views, which are embedded in myths that associate literacy with the development of higher cognitive skills, falsely endorse the claim that there is an important relationship between literacy skills and economic success.

Given the preceding perspectives, it is clear the concept of literacy in a skills-based approach has emerged in a much broader metaphorical sense, especially in the context of global literacy assessment. It began to include a range of other skills and competencies, such as numeracy and information and technological literacy (UNESCO, 2006:150). In this regard, numeracy is regarded either as a supplement to the set of skills encompassed by literacy or as a component of literacy itself (refer sections 1.5.3 and 2.1.1). Numeracy skills include “the ability to access, use, interpret and communicate mathematical information and ideas in order to engage in and manage the mathematical demands of a range of situations in adult life” (OECD, 2014b:26). This mechanical view of numeracy has been extended by Coben (2000:35) in a more ideological view as being competent, confident, and comfortable in using and applying mathematics in a particular situation (refer definition in 1.5.4).

Furthermore, competences that enable one to access and process information effectively have become essential as modern-day workplaces are increasingly knowledge- and technology-driven (Decarie, 2010; Goad, 2002; Thompson & Lathey, 2013). Information and technological literacy encompasses the capacity to use a variety of information and communication technologies (tools and applications) and other knowledge sources (e.g. personal and corporate knowledge bases) to solve problems, deliver messages and function effectively in rapidly-changing technological environments (Dagostino & Carifio, 1999:86; Smith, Mikulecky, Kibby, Dreher & Dole, 2000:380). Furthermore, Warschauer (2006:4) identifies four sets of overlapping and related literacy competences that are crucial for functioning in the modern-day work environment, namely, computer, information, multimedia and computer-mediated communication literacy.

In conclusion, even though in a skills-based approach literacy is often narrowly viewed as primarily a cognitive enterprise and measured as the possession of a set of largely technical skills (the OECD perspective), the concept has broadened to be more than the acquisition of mechanical language skills (reading and writing per se) and restricted to development in an individual (Krahn & Lowe, 1998). In this regard, Fagan (2001) explains literacy as behaviour that is functional and effective because of literacy capability. Literacy as such encompasses “the ability to read, communicate, compute, develop independent judgements and take actions resulting from them” (Graham, 1981:127) and mathematical and quantitative literacy competences are often regarded as complementary or supplementary to language literacy. However, what is crucial, Hull (2000) adds,

is that literacy skills should be applied critically to examine one's surroundings (e.g. the workplace and life) and push for personal growth and development and social change. Thereby, literacy becomes regarded as a situated sociocultural practice and the broader social contexts of literacy (e.g. the literate environment and the literate society), which encourage and enable literacy activities and practices, have become important (UNESCO, 2006). These perspectives intensified the tension between a skills-based approach to literacy and an ideological view of literacy and paved the way to reading as situated and social practice, which I discuss next.

## 2.2.2 An ideological view of literacy

Ethnographic researchers and the New Literacy Studies lead the way to literacy being regarded in an ideological perspective – in other words, as situated, sociocultural practice in which multi-modal literacies play a role. In this view, being regarded as literate has transformative power and developing critical literacy practices is essential. This perspective on literacy was adopted for the development of the conceptual frameworks in this chapter, although the development capability implies some technical competence attached to literacy (refer section 2.2.1).

### 2.2.2.1 Literacy as situated and sociocultural practice

The work of ethnographic researchers and the New Literacy Studies (refer studies of Barton & Hamilton, 1998; Gee, 1996; Heath, 1983; Maybin, 2000; Pahl & Rowsell, 2005; Rogers & Street, 2011; Scribner & Cole, 1981) paved the way to viewing literacy and literacies as situated. That is, all uses of written language can be seen as located in particular times and places, making literacy historically and culturally situated (Baynham, 1995; Baynham & Prinsloo, 2008). Equally, Barton, Hamilton and Ivanič (2000:1) alert that “all literate activity is indicative of broader social practices” and as such is embedded in particular social forms of activity (Baynham, 1995; Baynham & Prinsloo, 2008). Literate activity therefore not only develops or is functional within an educational institution; rather, a variety of social activities which take place in daily life – the workplace, the family, the community, the marketplace – constitute forms of literacy (Baynham, 1995; Baynham & Prinsloo, 2008). Such literacy practices are fundamentally mutually constructed, and are shaped by both institutionalised and informal relations of power (Baynham & Prinsloo, 2001:83–84).

Sociolinguistic researchers such as Bernstein (1972), Hymes (1972, 1974) and Cook-Gumperz (1986, 2006) influenced the conceptual shift to regarding literacy as situated in sociocultural contexts by taking into account of the role of texts in social interaction (refer section 2.2.1). In the sociolinguistic frame, the social context or event of the verbal interaction is the starting point for the analysis of spoken language (Lemke, 1995). The work of Hymes and Bernstein in this regard specifically sheds light on the nature of speech communities and how members use oral and written language in different contexts and roles. Bernstein's (1972) work relates to

understanding the relationship between speech production and social class and still has relevance for understanding working-class linguistic practices and attitudes, as well as social literacies and language. Hymes (1972:54) contributed the understanding that a speech community has rules “for the conduct and interpretation of speech” and for the interpretation of at least one linguistic variety. These rules and norms, which are both linguistic and social norms associated with the speech event and the community, govern speech events and acts (Hymes, 1972:54).

Similarly, Cook-Gumperz (1986:4-5) demonstrates how literacy involves a composite of socio-cognitive processes to produce and comprehend texts within interactional contexts, which in turn influence how literacy will be valued. Cook-Gumperz (1986, 2006) in this regard explains how shared contextualisation conventions (e.g. cues such as prosody, dialect, style, lexical and syntactic options) within any oral interaction guide participants to interpret language and assess the other’s intentions so as to formulate appropriate responses in turn.

Literacy is therefore best understood as a set of situated social practices that are observable in events, which in turn are mediated by written texts (Barton & Hamilton, 1998; Street, 2003:79). Heath (1982:50) in this regard defines literacy events as “occasions in which written language is integral to the nature of participants’ interactions and their interpretive processes and strategies.” Literacy events, in Heath’s conception, include those moments when inscription or decoding of text features in any way, but not necessarily centrally. What is central in events is the configuration of action, talk and text in multiple and socially varying ways (Baynham & Prinsloo, 2008:4). As such, literacy events are regulated by social interactional rules and involve the interaction of oral and written modes (Baker & Street, 1991; Heath, 1982, 1983).

Street (1984:1) extends the notion of “literacy event” to “literacy practice” – a more general and broader abstract. According to Street (1988, 2003:79), “literacy practices refer to the broader cultural conception of particular ways of thinking about and doing reading and writing in cultural contexts.” He further elaborates that participants bring to a literacy event “concepts and social models regarding what the nature of the event is and makes it work, and give it meaning.” Literacy practices are thus observable in events, often mediated by written texts for a literary purpose to be achieved and embedded in broader societal goals and cultural practices (Maybin, 2000; Street, 1995:127). As Baynham (1995:39) concludes, literacy practices are “what people do with literacy within a literacy event, but also what they make of what they do, how they construct its value and the ideologies that surround these activities.”

Literacy became increasingly recognised as a relative and socially-contingent practice, and interpreted to be “what people need, or want to do, often in interaction with other people, to be able to go about their daily lives” (Searle, 1999:100). As Baker and Street (1991:2) put it, reading, writing and enumerating are cultural practices,

learnt in specific cultural contexts and “imbued with epistemological significance.” Therefore, the ways in which people use and value reading and writing are rooted in their conceptions of knowledge, identity and being (Rogers & Street, 2011; Street & Lefstein, 2007). As such, literacy must be understood as a social process – it contributes to the construction of a particular kind of citizen, a particular kind of identity and a particular concept of the nation (Street, 1995:127). Regarding literacy in this ideological manner would form the premise of a functional view of literacy later on (refer UNESCO’s 1958, 1978 and 2005 definitions of functional literacy in section 2.1.1).

In Street’s (1984, 1988) view, literacy cannot be regarded as a unitary construct and as simply knowing how to read and write a particular script; instead, literacy should serve specific purposes in specific contexts (Rogers & Street, 2011; Street & Lefstein, 2007). Street (2001, 2003, 2005, 2012) and Street and Lefstein (2007) subsequently distinguish between multiple literacies and multi-literacies. For multiple literacies, plurality exists in the literacy events and social practices to which languages and literacies are put. For example, Street (1984) observed in Iran that literacy activities are done for many different purposes – religious activities, commercial or occupational work, personal or family purposes, or bureaucratic reasons. On the other hand, the different modes of meaning constitute multi-literacies. Literate people have different conceptions of the meanings of what they are doing and these meanings are not just individually or cognitively derived, but can also be inferred from the cultural process itself (Barton & Hamilton, 1998; Maybin, 2000; Street, 1984, 1988, 2009). These multi-modalities of meaning-making are further defined and explored in the views of Cope and Kalantzis in section 2.2.2.2.

Gee (1990, 1996) extended the ideological view of literacy practices as variable, contextual practices and demonstrated how people, linguistic resources, media objects and strategies are linked in contextualised ways for purposes of meaning-making. In his account of how literacy is used to make meaning within semiotic domains, Gee (1990:142–143) introduced the concept of “discourses”. According to Gee (1990, 1994, 1996), words, symbols, images and/or artefacts have meanings and combine together to take on complex meanings within semiotic domains. As such, these meanings are situated meanings. In order to understand any word, symbol, image or artefact, (or combination thereof) in a domain, a person must be able to situate the meaning of the word, symbol, image or artefact (or combination thereof) within actual or mentally simulated embodied experiences of action, interaction, or dialogue in or about the domain (Gee, 1996; Gee, Hull & Lankshear, 1996; Lankshear, Gee, Knobel & Searle, 1997). Domain members thus share a set of practices, values and norms, as well as a common language, genre or register, which Gee (1990:153) defines as “social language.” Gee (1996:127) refers to these meaning-making experiences and language uses as “discourses”, which, in his view, are “language plus other stuff, i.e. ways of talking, listening, reading, writing, acting, interacting, believing, valuing, using tools or objects in particular settings and at specific times as well as gestures, glances, body positions and clothes.”

In the discourse sense, Gee is building on Bourdieu's (1977:646) notion of "expanded competence" or language as praxis, which introduced concepts of language as being functional and strategic. Bourdieu (1977:646) explains language competence as expanding beyond the knowledge to construct grammatically coherent sentences to knowing about "appropriateness" of using language in a certain style or discourse. Discourses create perspectives from which people are able to speak, listen, read, write, act, think, feel, believe and value in certain characteristic, historically recognisable ways (Bourdieu 1977, 1991:69–70; Foucault, 1984). Gee (1990, 1994, 1996) in this regard distinguishes between primary discourse and secondary Discourse<sup>11</sup>. A primary discourse involves creating identity within the home, "family" (however this concept is defined within a given culture) or other initial acculturating groups, and is achieved without conscious effort. However, participation in secondary institutions such as schools, bureaucracies, community groups and workplaces requires mastery of or fluent control over a secondary Discourse (Gee, 1990; Gee et al., 1996; Gee & Lankshear, 1997). Secondary Discourses involve the development of meta-knowledge and meta-language usage to value, believe, think and enact social practice within the secondary Discourse (Gee, 1990:153).

Maybin (2000:207–208) explains the participation in literacy practices and events ("discourses" in Gee's sense) to be part of a "continual construction and negotiation of identity" for people in different communities, ranging from academic conferences to catholic parishes, family literacy schemes and prisons. According to Maybin (2000:207–208), individual discourses are shaped through their insertion, via local events, into broader institutional discourses such as education. This suggests a dialectical relationship and demonstrates the interdiscursivity and intertextuality at play in literacy events and literacy discourses (be it discourse or Discourse in Gee's sense). Individual literacy activities (or discourses) are given "meaning by the social and cultural contexts in which they occur" and, in turn, these larger social structures and cultural processes are constituted by literacy activities (Cervero, 1985; Maybin, 2000:207–208; Street, 1984). For example, literacy events such as working on a study project, re-versioning existing documents or filling in a form invoke broader cultural and historical patterns of literacy practices and, in some way, instantiate, subvert or comment on these practices (Maybin, 2000:198). In turn, such literacy practices insert themselves into the everyday life, actions, attitudes and learning processes of the individual through participation in these literacy events (Baynham & Prinsloo, 2001; Maybin, 2000:207–208; Street, 1995:28).

As highlighted in preceding paragraphs, the engagement in literacy events and discourses and the manner in which literacy is used depend on the context and the relationships among participants. Barton and Hamilton (1998:7) assert that, as a result, some literacies become more dominant, visible and influential than others.

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<sup>11</sup> The use of the capital D indicates the dominance of this type of literacy discourse for the individual and society.

Barton and Hamilton (1998:9–14) in this regard distinguish between literacy practices that seem obvious and dominant (e.g. organising life, personal communication and private leisure) and subtle everyday literacy practices (i.e. documenting life, sense-making and social participation). They term the latter “vernacular literacies” and explain these to be the literacy practices that are rooted in everyday experience and serving everyday purposes. As such, vernacular literacy practices correlate with Gee’s concept of primary discourses and can be contrasted with dominant literacy practices (or secondary Discourses) that follow from formal education, religion and the workplace. Through helping children with school and literacy tasks or filling the home space with literacy materials, parents and society reinforce the association of literacy with learning and pedagogy (thereby reaffirming the dominance of these practices), while the kinds of literacy that may be acquired from peer groups and the community are often marginalised (Street, 1995:28).

Therefore, as explained earlier on in this section, the sociality of literacy practice is undeniable. Luke and Freebody (1999:1–6) explain this sociality as being constituted in four ways – by its materials and systems, the social interactions, the institutions involved and the surrounding ideologies. Any literacy practice has a material history, which is found in the writing materials and systems and the material traces they leave. Furthermore, literacy practices socially evolve through interactions, possess institutional histories and are bound to certain ideological considerations that shape these material, interactional and institutional histories. Literacy education should therefore focus on neither skill development nor deep competence. It is about the (Luke & Freebody, 1999:2):

institutional shaping of social practices and cultural resources, about inducting successive generations into particular cultural, normative ways of handling texts, and about access to technologies and artefacts (e.g. writing, the Internet) and to the social institutions where these tools and artefacts are used (e.g. workplaces, civic institutions).

Then literacy, as Freebody (1997:16) once noted, becomes “for acting on and in the world.”

In conclusion, the ideological view of literacy positions literacy as situated social practices, learnt in specific cultural contexts through participation in literacy events and imbued with epistemological significance (Cervero, 1985; Street, 1984). Literacy practices have a range of different social purposes, demands and processes with economic, historical and political implications (Fagan, 2001; Gee, 1996; Gee & Lankshear, 1997). They are embedded in social institutions and relations of power and authority (Cradock, Resnick, Levine & Teasley, 1992; Levine, 1986). These power relations in turn pattern literacy practices (Baynham & Prinsloo, 2001, 2008) to the effect that the literate could be held in higher esteem than the less literate (Cervero, 1985), and individuals could be included or excluded in social and work practices by virtue of being considered literate (Baynham, 1995).

Engagement in literacy discourses (primary and secondary in Gee's sense) and developing a literate identity thus carry power when one moves across contexts that frame what people can do with literacy (Freebody, 1994; Lo Bianco & Freebody, 2001). Next, I discuss the various ways and modes in which literacy is used to communicate and make meaning across such contexts.

### 2.2.2.2 Literacy as multi-modal capabilities

As referred to in the previous section, literacy is used in different contexts for purposes of communication and meaning-making so as to do work and to achieve life goals. Finnegan (1988) in this regard proposes literacy to be a continuum of communication modes in different societies and an ongoing dynamic interaction between various oral and written modes within a single society. He further observes that even the practices of individuals in their use of these modes may vary from situation to situation. Literacy therefore necessarily encompasses not only engagement with different coding (or sign) systems and modes of meaning-making, but also critically understanding the nature of the multi-modal texts, produced and utilised by literate individuals, and what they mean in literate societies (Cazden et al., 1996; Kress & Van Leeuwen, 2001; Olson & Torrance, 2001).

In modern society, meaning is made in ways that are increasingly multi-modal and the written-linguistic modes of meaning interface with oral, visual, audio, gestural, tactile, spatial and behavioural patterns of meaning (Cope & Kalantzis, 2000:5–6). Street (2010:353) defines a mode as “a regularised organised set of resources for meaning-making, which might include image, gaze, gesture, movement, music, speech, or writing amongst others.” Modes, Kress (2011:208) adds, are “socially made and culturally available material-semiotic resources for representation.” Multi-modality of literacy thus resides in the distinctive literacy practices of different modes.

Cope and Kalantzis (2000:26–27) categorise these meaning-making modes in terms of their design elements for purposes of communication of meaning. The categorisation explains the design of multi-modal texts in terms of linguistic (i.e. various elements of linguistic meaning such as vocabulary, metaphors, information structures and grammar), visual (e.g. elements such as images, page layouts, colours and screen formats), audio (e.g. music, sound effects and voice tone), gestural (e.g. body language, posture, gestures, sensuality, feelings and affect, and behaviour) and spatial (e.g. the meanings of environmental spaces, architectural spaces and other spatial relations between objects) modes.

Cazden et al. (1996) emphasise that the design notion is indicative of the productive and innovative potential of the different modes as meaning-making system, thereby compelling thinking of literacy as more than communicating meaning within written-linguistic modes of meaning. Language (i.e. speech and writing) represents but one of several modes through which communication is conducted and meaning is made (Cazden et al., 1996; Gee, 1990; Kress, 2003; Kress & Van Leeuwen, 2001). However, language and text as sign and social fact remain important focal points in any literacy discourse, because of the functions they serve in people's

lives (Halliday, 1973, 1978). Halliday (1978:242–244) identifies these functions or “meta-functions” of language as ideational (“about something”), interpersonal (“doing something”) and textual (“the speaker’s text-forming potential”). Text (as sign), he adds, can only be interpreted in relation to the ideational, interpersonal and textual functions of the sign as situated in the specific social context.

Emerging from these socio-semiotic and ethnographic perspectives, literacy is viewed as being multi-modal, imbued with intention, as well as culturally and context constituted and shaped (also refer section 2.2.2.1). As such sign-makers and meaning-making, the social place and environments in which they make their signs, the tools they use and the material qualities of the texts they produce necessarily have become relevant (Luke & Freebody, 1999; Street, 2009). Sign-making and meaning-making are situated at a given moment in time and place and guided by the interests of the meaning-maker, who uses multiple ways (or modes) to communicate rationality, logic, human desire and affect (Kress, 1997, 2003).

Moje (2000) for example observed how gang-connected adolescents use works of art, music, dress codes, makeup, tattoos, body movements, gestures and hand signs for social identification and to claim power and space in and out of their gangs. Pahl and Rowsell (2005, 2006) and Pahl (2007) also used the multi-modality theory to show how children’s drawings serve as a window into understanding their meaning-making and provide a formative picture of their pathway into literacy. They observed how the children (sign- and meaning-makers) in their research created meaning through engagement in literacy practices so as to produce a text or artefact (Pahl & Rowsell, 2006).

Using and producing multi-modal texts to communicate meaning therefore not only demonstrate active participation in literacy practices in primary and secondary discourses (refer Gee, 1996, 1999), but also the ability to negotiate, transform and materialise these practices in text or artefact. Thereby, a literate identity is established in an engagement that Gee (1999:49) describes as pattern recognition – “assembling the situated meanings that you need for action in the world.” In such literate behaviour power and transformation reside - which is explored in the next section.

### **2.2.2.3 Literacy as critical and transformative power**

Freire (1973) first understood becoming literate as a purposeful, contextual and transformative process – this is the earliest instantiation of a more critical and ideological view of literacy. In this regard, he defines literacy as more than the skills associated with reading and writing, however intimately connected to language itself, grounded in the historical and cultural background of the learner and centred in the personal and social construction of meaning (Freire, 1973; Freire & Macedo, 1987, 1995). Freire (1973) and Freire and Macedo (1987) posit that literacy must go beyond the process of learning the skills of reading, writing and arithmetic, and must contribute to the liberation of humanity and to one’s full development. Central to Freire’s pedagogy is the

notion of critical literacy – a goal to be attained in part through engaging with books and other written texts but also, more profoundly, through “reading” (i.e. interpreting, reflecting on, interrogating, theorising, investigating, exploring, probing and questioning) and “writing” (acting on and dialogically transforming) the social world.

To critically read and transform society in Freire’s sense requires clear understanding of what literacy means for the individual and society. Scribner (1984) and Scribner and Cole (1981) use the metaphors of adaptation, power and state of grace to explain the relevance and powerful use of literacy. Literacy as adaptation is conceived to be about survival and functionality and is described as the level of proficiency necessary for effective performance in a range of settings and customary activities (refer sections 2.1.1 and 2.2.2.1). Literacy as power is about the powerless claiming power through access to knowledge, for example through reading activities. The final metaphor explains literacy as state of grace – in other words, literacy is regarded as a transcending power that allows individuals freedom of expression and mind.

Levine (1982:264–265) echoes Scribner’s power metaphor in his description of the social and political significance of literacy. The power of literacy is largely derived from its role in creating and reproducing – or failing to reproduce – the social distribution of knowledge. St Clair (2010), drawing on capability theory, also proposes the transformative power and value of literacy to lie in what people can do with literacy – how it is acquired and how it is used determine its value for the learner. Through literacy, the powerless gain access to knowledge and claim power to ultimately attain freedom of expression and mind – a state of grace in Scribner’s terms (Levine, 1986:46; St Clair, 2010). In this sense, Janks (2012) proposes that critical literacy should open the door to mastery of techniques to enable functioning in society and maintaining human relations. Then literacy becomes not an end in itself, but a critical tool and fundamental human right to support the pursuit of other human rights (UNESCO, 2013:17).

Moreover, Lyle (2014) understands critical literacy practices as a way to engage in teaching and learning that is informed equally by theoretical origins and practical possibilities in this regard. Mindful of this dual focus, critical literacy aims first to create in students an awareness of social injustice and then to help them develop critical thinking skills that will enable them to challenge systems that continue to limit socially just education (Janks, 2012). Thus conceived, literacy becomes power to transform – it is through literacy that a critical consciousness of the contradictions of society in which one lives and of its aims is acquired. Furthermore, literacy stimulates initiative and one’s participation in the creation of projects capable of acting upon and transforming the world (UNESCO, 2006:154). For example, initiatives in New Guinea and South Africa, where literacy learning has been linked to social action, promoted critical literacy awareness respectively among marginalised female waste-rag pickers and Xhosa farm labourers, and actually facilitated social transformation (Janks, 2012).

In conclusion, global understanding of the socially transformative power of literacy is emerging in that literacy is no longer exclusively regarded as individual transformation, but also as a contextual and societal one. The broader social contexts in which literacy is encouraged, acquired, developed and sustained have necessarily become significant as the quality of literate environments affects how literacy is practised and understood (Howie, Combrinck, Roux, Tshele, Mokoena & McLeod Palane, 2016; UNESCO, 2013). It is through engagement in literacy practices (and critical literacy as such) that literate societies are created which, as Olson and Torrance (2001:12–15) previously posited, should be more than locales offering access to printed matter, written records, visual materials and advanced technologies, but should enable the free exchange of text-based information and provide an array of opportunities for lifelong learning.

### 2.2.3 How is literacy then defined in an ideological perspective?

In a thoughtful foreword to the Kalmar (2001:iv) volume, Gee writes:

Literacy is not first and foremost a mental possession of individuals. Rather it is first and foremost a social relationship among people, their ways with words, deeds, and things and their institutions. Literacy is primarily and fundamentally out in the social, historical, cultural and political world. It is only secondarily a set of cognitive skills, skills which sub-serve literacies as social acts in quite diverse ways in different contexts.

The broader question subsequently raised by Gee et al. (1996) is whether the types of literacy taught in schools and adult programmes are relevant (or meaningful) to the present and future lives of learners – a question that that this conceptual framework of workplace literacy attempts to address.

In the preceding paragraphs, it was noted how the conceptualisation of literacy changed from being regarded as a mere cognitive toolbox with reading and writing skills (Graff 1982, 1987a, 1987b) to a more ideological view of literacy as situated and social practice. As such, contextual and cultural factors frame literacy practices and influence how literacy is perceived and valued. Although proficiency in using language and other coding systems (e.g. numbers, mathematical operators or digital code) to produce and comprehend multi-modal texts (oral, written or mixed-mode texts) for purposes of meaning-making and communication is still essential, this is not the end purpose of what it means to be literate. Literacy allows one to function in a highly technical world, communicate in multiple modes and the freedom to critically transform own literacy practices and those in the workplace.

As said, literacy serves multiple functions and purposes for the individual and society. Wiley (1996:143–144) summarises the functions of literacy practices (in particular writing practices) as being instrumental (e.g. literacy is used in daily and work contexts), social-interactive (e.g. using language and literacy for communication

purposes and building relations), news-related, memory-supportive, substituting oral messages, provision of permanent record (e.g. official records such as birth certificates and contracts) and confirmation (e.g. support for currently-held ideas such as product instructions and guarantees).

Furthermore, literacy has material qualities expressed in multiple modes and signs, for example shop signs, graffiti, text messages (SMS), tattoos, Facebook updates, jottings and scrawls (Kress, 2003). These material qualities are instantiated in literacy practices and can only be understood by critically interpreting the social and cultural context of the sign-maker (or meaning-maker) and his/her particular designs of meaning (Kress, 2003, 2011; Rogers & Street, 2011; Street, 2012). As Street (2009:142) puts it, literacy in the modern world “remains a multi-modal sign by which we know the world we live in; it refers not simply to the skills of reading and writing, but to the way we think about ourselves as a working and thinking being.”

In the next section, these views of literacy are explored in terms of a workplace context and how literacy development unfolds in the modern-day workplace.

## 2.3 Perspectives on workplace literacy

In this section, an overview is provided of the expectations of literacy in society and at work so as to formulate a definition of workplace literacy and identify which literacy capabilities are essential in the workplace.

### 2.3.1 What is expected of literacy in society and at work?

Literacy has always been linked to work and integration into civilised society, but Oxenham (1980), Goody and Watt (1988) and Mikulecky (1990) have described how difficult it is to separate the effects or consequences of literacy from the historical, social and political contexts from which they arose. As a result, discourses centre on whether literacy contributed to the rise of civilisation and social progress or whether conceptualisations of literacy resulted from dramatic social and political changes in a society or culture (Oxenham, 1980). Despite these contestations, it cannot be disputed that literacy adds to the economic value of people and increases their exchange value in the labour market (Black, 2002; Marginson, 1995, 1997). Black (2002:1) in this regard cynically comments that:

literacy is generally equated with success in life, with notions of a person being ‘educated’, obtaining a job and having access to the ‘goods’ and trappings of well-being that are valued highly in society. The corollary to this perspective is that a lack of literacy has dire consequences.

As highlighted in section 2.2.1, the autonomous view of literacy as a decontextualized set of generic, mechanical skills gave rise to a deficit model of literacy (Baker & Street, 1991; Street, 1984, 1988) in which individuals who do not reach a given standard are labelled as “illiterate” (Freebody, 1994; Freebody & Luke, 1990; UNESCO,

2005). In this restricted view of literacy, such individuals are perceived to be incapable of logic, scientific thought, literary appreciation, democratic processes and informed judgement (Freebody, 2007; Freebody & Luke, 1990; Lo Bianco & Freebody, 2001) and, as a result are often excluded from employment opportunities and contribution to social wellbeing (UNESCO, 2005). In this frame, Venezky et al. (1990:v) and Hunter (2007:244) point out, illiteracy and the individual are unfairly blamed for the problems of society associated with poverty, poor health and criminal behaviour.

The perceived causal link between the outcome (and quality) of literacy education and increased social cohesion, wellness and productivity is what Graff (1987a:323) terms the “literacy myth.” Olson and Torrance (2001:13) in this regard concede, literacy “is not the solution to a host of social ills,” including poverty, malnutrition and unemployment - in most cases literacy is not even relevant to the solution of these problems. Furthermore, there are no across-the-board connections between increased literacy and positive societal, productivity or employment outcomes (Aronowitz & Giroux, 1985:199; Maddox, 2007). Such a stance is flawed and results in a “literacy crisis”, Aronowitz and Giroux (1985:199) explain. Nor are poor education and lack of literacy to be blamed for low productivity or unemployment. Rather, economic and social inequality and political powerlessness in the job market cause literacy and numeracy problems (Aronowitz & Giroux, 1985:66; Black, 2002:12; Black & Yasukawa, 2011; Luke, 1992:10).

Although a direct correlation between literacy education and economic wellbeing and employment has been disputed (refer Aronowitz & Giroux, 1985; Black, 2002; Black & Yasukawa, 2011; Graff, 1987b; Luke, 1992; Maddox, 2007), Holme (2004) asserts that its symbiotic relationship has also been recognised in the interaction and interplay at individual and societal level, which can be mutually beneficial or detrimental. Within the community and the individual life, what literacy allows one to do and become, becomes evident (Holme, 2004). As Olson and Torrance (2001:15) affirm, literacy can play a role of perceived significance in situations where individuals are socially empowered by their participation, “all because they are given access to communities and institutions by virtue of being literate.” Furthermore, although the influence of wider political and economic forces can never be ignored, Robinson-Pant (2004, 2008) concedes that social change can be initiated through literacy development. For example, Sibiya and Van Rooyen (2005:479) illustrated the positive effects of literacy for the women in their research, but conclude that functional literacy in itself does not automatically empower women in the South African workplace.

While statistics on literacy and numeracy levels in global reports produced by UNESCO and the OECD (e.g. OECD, 1995, 2014b) indicate a relationship with economic activity and employment status, the relationship is not necessarily causal (refer preceding paragraphs). Opposing voices strongly argue (refer Aronowitz & Giroux, 1985; Freebody & Luke, 1990; Luke, 1992; Luke & Freebody, 1999) that behind these statistics there are many complex economic variables and macro-structural factors impacting employment status, e.g. manufacturing

enterprises moving offshore in the pursuit of cheap labour. These factors more likely relate to the reason for unemployment than the lack of literacy or numeracy proficiency does. Moreover, Black (2002), Black and Yasukawa (2011) and Black et al. (2015) reason, governments and other agencies produce and inflate literacy and numeracy problems so as to push certain social and political agendas in the interests of capital and economic power.

However, international agencies such as the World Bank, UNESCO and the OECD continue to focus on literacy as key to fostering social progress. In this kind of agenda, higher levels of educational attainment and literacy are strongly associated with better outcomes in the labour market (e.g. higher employment rates and higher earnings), living better and leading healthier lives (OECD, 2014a). Black (2002) refers to a variety of studies in Australia (e.g. Miller & Chiswick, 1997; Lee & Miller, 2000) in which higher literacy levels have been found to correlate with higher income/status jobs, while the reverse has been found to be the case for lower literacy levels. OECD literacy surveys reflect similar results. Across OECD countries, 73% of people without an upper secondary education found themselves at or below the median level of earnings, while only 27% of university graduates did. On average, 5.8% of adults without upper secondary education, but who had a moderate level of literacy proficiency, were unemployed compared to 8.0% of adults with similar educational attainment, but who had low levels of literacy proficiency. Similarly, among tertiary-educated adults, 3.9% of those with lower literacy proficiency were unemployed compared to 2.5% of those with higher proficiency. Countries with large proportions of low-skilled adults are also those with high levels of income inequality (OECD, 2014a).

Given these statistical findings, it is clear that inadequate levels of literacy among a broad section of the population potentially threaten the strength of economies and the social cohesion of nations (OECD, 1995). Improvement of functional literacy levels is therefore regarded as crucial to the economic performance of industrialised nations that rely on heavily on the written word (OECD, 1995:13). In addition, because society has become more complex and low-skill jobs are disappearing, a higher level of literacy is increasingly required to function productively and efficiently in the workplace (Goad, 2002:15; OECD, 1995:13). The International Labour Organisation (2005, 2014) further reports that the transition to a workplace remains problematic for too many young people, because they do not possess the basic literacy and numeracy proficiency that is necessary to access vocational training or secure and sustainable employment.

Aside from the so-called socio-economic value of literacy, there are other benefits. Levels of interpersonal trust and participation in the political process and volunteering activities are also perceived to be closely related to both education and literacy levels (OECD, 2014b). Highly literate workers perform work more accurately and productively, understand the organisation and its mission and goals better, and have increased understanding of and confidence in work roles (Benseman, 2012:101; Hull, 1995:19). Certainly, as Beder (1999:5–6) concludes, it may well be that the power of literacy lies not in immediate employment gains, but rather in its

function as an enabler of a wide range of other benefits such as high-level employment and increased productivity.

In conclusion, the statistical findings and perceived value of literacy show that literacy and literacy development are enabling conditions for further learning and development, or could be the first steps towards employment, though this relationship is not a causal one (refer arguments by Black, 2002; Freebody & Luke, 1990; Graff, 1987b; Luke, 1992; Maddox, 2007). Literacy has and adds value to the individual life and in the workplace.

In the next section I look at workplace literacy practices and how literate identity and behaviour manifest therein.

### 2.3.2 Workplace literacy – definitions and manifestations

In an ideological view of literacy, Case, Ainsworth and Emerson (2004:24) concede that “literacy is not a static attribute,” but one that is embedded in how people use and engage in literacy practices in the workplace to do work (refer section 2.2.2). Literacy is therefore socially construed and situated in the diversity of literacy practices, genres, styles and types of texts associated with various work activities, domains or social identities in the workplace (Martin-Jones & Jones, 2000).

Gowen (1992) and Tannock (2001:141) broadly define workplace literacy as a matter of being literate about the workplace and responding effectively to the literacy demands of the modern-day workplace. It means being able to dip appropriately and as needed into a wide and deep repertoire of situated ways of using written language and other forms of representation in order to carry out a work-related activity (Hull, Katz & Oren, 1996:197). As such, Fingeret (1994:31) and Goad (2002:15) propose that workplace literacy is construed by understanding the social settings and power dynamics at work. It implies mastering and manipulating the social rules that govern literate activities in the workplace (Hull, Katz & Oren, 1996:197) and understanding “how, when, why and by whom text is created and used” (Hull, 1995:19). Workplace literacy, Hull (1999, 2000) interprets, means conceptualising one’s work in terms of its written (and other modal) representations so as to develop a literate identity within the sociocultural systems of the workplace, in other words, the social practices and social relationships generally mediated by language (Gee et al., 1996).

What would the manifestations of workplace-literate identity and behaviour entail? Earlier, Diehl and Mikulecky (1980:226) categorised literate activity as either “reading to know” or “reading to do.” “Reading to do” characterises literate activity in the workplace, while “reading to know” is what children do mostly in school (Hull et al., 1996:193). Diehl and Mikulecky (1980:226) further explain reading at work to be ubiquitous and prevalent in the information-rich contexts of the workplace where reading is done to access information as an important aspect of functional literacy. Literate behaviour means one is able to read and use linguistic and extra-linguistic cues in the job task so as to gain information quickly and to put it to use.

However, Askov (2010:543) argues that workplace literacy is “broader than reading and writing” and “inclusive of higher order thinking skills, problem-solving and mathematics.” Manifestations of literate behaviour could thus range from very basic functions such as performing simple, self-contained tasks, such as reading for information or sending an email, to more complex categories of literacy purpose and usage, such as participating in the flow of information to solve problems and exercising critical judgement (Gee et al., 1996; Hull, 1997, 2000; Hull et al., 1996). High literacy, Dole (in Smith et al., 2000:383) continues, manifests in work behaviour as self-regulation and monitoring one’s thinking and work while selecting, organising, interpreting and synthesising new information. Therefore, the capability to access and decipher explicit information, take decisions, perform ambitious tasks and solve problems has become standard work literacy behaviour (Heisig, 2009).

As described in section 1.2.3.1, work environments have become highly technological and involve participatory structures such as self-directed teams. Similarly, literacy and communication demands have grown more complex and multi-modal (refer section 2.2.2.2). One is expected to communicate and work across different communities of practice, often using specialised vocabulary, a specific style of writing, and utilising communication or digital technology in multiple ways (Smith et al., 2000:379, 381). In addition to the variety of multi-modal literacies required to perform work, different languages, language varieties and scripts add to the diversity in and complexity of workplace literacy practices and communication (Lo Bianco & Freebody, 2001; UNESCO, 2013). This, Dole (in Smith et al., 2000:383) adds, requires the worker to be capable of communicating diverse perspectives, ideas and beliefs within multicultural (and often multilingual) teams using multiple modes of communication.

Technological advancement impacts not only the individual, but also work (Heisig, 2009; Zuboff, 1988). Information technologies have reconfigured work processes as abstract processes and brought new analytical power (and literacies) to workplaces – there is thinking about and through technology so as to modify or improve workplace practices and outcomes (Lindenskov & Wedege, 2001). As a result, Mikulecky (in Smith et al., 2000:379) continues, workers deal with new types of texts emerging in these technological and digital environments, requiring of them to develop new literacies.

Warschauer (2006:154–155) explains these new digital texts to have different features compared to traditional print-based texts – they are multi-modal, created in a wide range of genres, characterised by non-linear ways of text connection and situated in numerous easily accessible contexts. For example, information is often presented on the screen as a mix of print and three-dimensional visuals or support could be embedded on the same screen in the form of links to help screens, tutorials or glossaries. The technology user must be able to search and navigate through higher levels of visual and print detail and utilise decision-making skills to acquire new or at least modified interpretation of the information on the screen. Mikulecky (1982, 1984) and Smith et al. (2000:379) further predict that, in future (if not already), workers will be expected, apart from simply activating

and accessing new literacy tools made available by technological advancement, to critically engage in complex information systems to do work and for their own development.

In conclusion, Hull et al. (1996:198) reiterate that workplace literacy is socially construed and connected to the power dynamics in the workplace. Literacy manifests in ordinary tasks such as sending an email or reading a report, but increasingly also in high-prestige functions such as exercising judgement and problem-solving. Literate behaviour is expected in highly technological and diverse work environments where sophisticated and multi-modal forms of literacy practice and communication are used. Texts are no longer only printed and require new capabilities for critical engagement and productive work. Literacy is further key to functioning and working in multicultural (and often multilingual) teams which requires self-regulation and monitoring of literate behaviour.

How these views and ideologies on literacy, and workplace literacy as a component thereof, play out in a conceptual frame for the TVET college graduate is discussed in the next section.

## **2.4 Conceptual framework for workplace literacy**

Workplace literacy is conceptualised as four evolving layers – as situated and social practice, as applied and functional practice, as mastery and manifestation of literate identity and behaviour and as critical and transformative practice.

### **2.4.1 Conceptualising workplace literacy**

The conceptual framework for literacy is illustrated (refer Figure 2.1) with an envisaged link of progressing from college to the workplace. In the workplace, further literacy development should be enabled along and through similar practices. Also, although these literacy practices evolve to become broader and more inclusive, they remain grounded and situated in sociocultural contexts and events. Furthermore, literacy development is not to be regarded as sequential, although the illustration depicts it in terms of layers. In other words, literacy develops through engagement in literacy practices and the individual gradually becomes able to use literacy critically and creatively so as to function independently in studies and work.

Given the theoretical lens of literacy as a socially construed and situated practice, consisting of a literate identity and multi-modal capabilities that manifest in literate behaviour, the following premises underpin my own conceptualisation of literacy for the TVET college graduate:

- (i) Literacy and learning are situated social practices (refer section 2.2.2.1).

- (ii) Literacy practices are developed through application within multiple contexts and modes of communication that relate to the vocation or workplace these students envisage transitioning into (refer section 2.2.2.2).
- (iii) Literacy is used for a variety of functions and for different purposes (refer sections 2.2.2.1 and 2.2.2.2).
- (iv) Literacy manifests in capabilities that find expression in literate identity and behaviour.
- (v) Critical literacy practices hold transformative and creative power (refer description in section 2.2.2.3).
- (vi) There is a developmental aspect attached to becoming literate, ranging from concept recognition to independent mastery and display of literacy capabilities (refer Langer, 2003:322–324; Langer & Knefelkamp, 2001). Capabilities are defined as “attunements to constraints” (Gibson, 1977) and are regarded by Sen (2005) as the opportunity to achieve valuable combinations of human functionings – in other words, what a person is able to do or be.

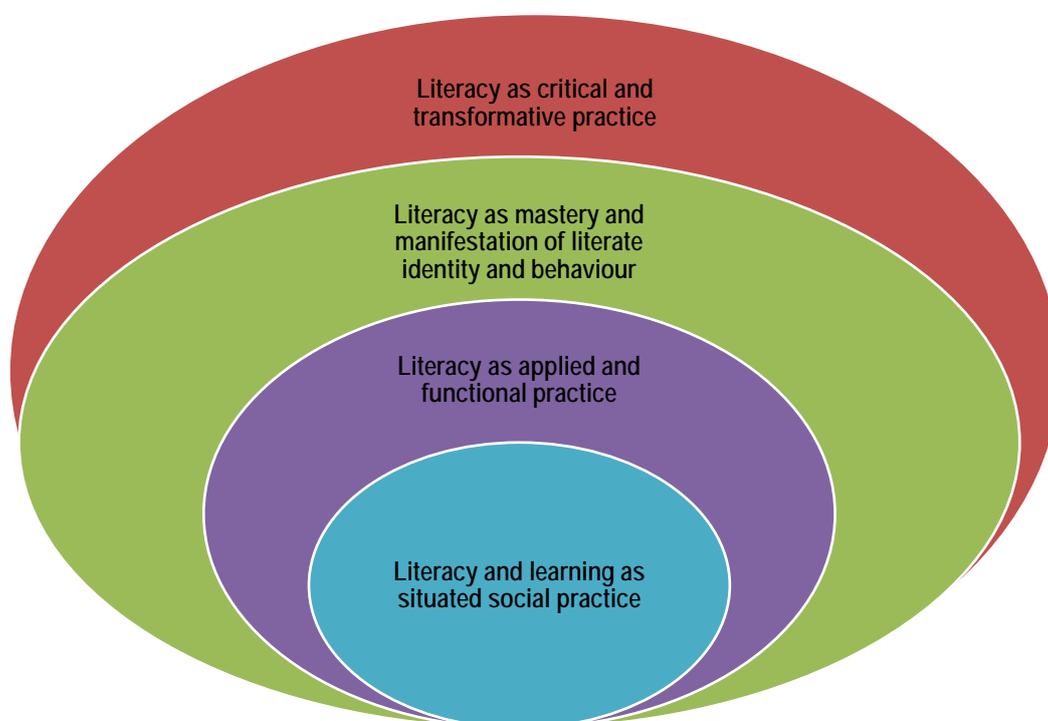
The premise of literacy being assimilated in a developmental approach is based on the model conceptualised by Langer and Knefelkamp (2001) – the Inner-City Workplace Literacy Arc (ICWLA). This project study was selected to guide my own conceptualisation because of the similarities in terms of ethnicity and socio-economic circumstances between the adults involved in the project and the students at TVET colleges. In this sense, the acculturation challenges experienced in a formal education and training institution where the teaching and learning language and culture are English might be similar. In addition, there are commonalities shared between the New York students' transition to work from a community college system and the TVET college graduates' transition to work from a technical and vocational college system in South Africa. These two college systems are, however, not completely similar.

The ICWLA model was designed to assess the development of workplace skills among adults from economically impacted communities – in this case Harlem, New York. The ICWLA is a classificatory scheme designed to assess individual development in six distinct sectors of workplace literacy, each in relation to five developmental stages of workplace culture and labour market literacy. Each sector of a person's workplace literacy develops in a linear and integrated way. The six sectors of workplace literacy development are: cognition, technology, business culture, socio-economic values, community and ethnic solidarity, and self-esteem.

Cognition in literacy practice involves capabilities necessary for learning and completing job duties in the business world, such as computation; the ability to read, comprehend, and retain written information quickly; the ability to remember and execute spoken instructions; and the ability to critically examine data. Cognitive skills

and an aptitude for technology are developed as a form of literacy (technology). The knowledge and practice of proper etiquette in workplace settings with regard to workplace inter-relationships denote business culture literacy. Socio-economic values in workplace literacy practices incorporate the ability to articulate and act upon mainstream business values, which shape the work ethic. Such values, e.g. independent initiative, dedication, honesty and personal identification with career goals, are associated with a person's appreciation for intellectual life, cultural sensitivity for others, and sensitivity for how others view their role in the workplace. Commitment to the education and professional advancement of even ethnic minority groups and underserved communities is the focal point in development of community and ethnic solidarity in literacy practices. Developing self-esteem in relation to workplace literacy includes developing a devotion to learning and self-improvement, self-evaluation, the ability to acknowledge and resolve workplace conflicts, and resilience when faced with personal and professional challenges (Langer, 2003:323–324; Langer & Knefelkamp, 2001).

The ICWLA further characterises an individual who assimilates workplace literacy norms as someone who has concept recognition of what literacy practice is required in the workplace, understands the importance of views and inputs of co-workers, can function in a multitasking workplace environment, has the ability to transform knowledge acquired from others into performance, and is capable of reaching a level of mastery in literacy application and practice (Langer, 2003:323–324; Langer & Knefelkamp, 2001).



*Figure 2.1: Conceptual map for workplace literacy*

How, in terms of this conceptualisation, literacy evolves as situated social practice to a literate identity that manifests as literate behaviour is described in the sections that follow.

#### **2.4.2 Literacy and learning as situated social practice**

Literacy is best understood as a set of situated social practices that are observable in events, which in turn are mediated by multi-modal texts (Barton & Hamilton, 1998). Freebody and Luke (1999) explain the sociality of literacy practices to be constituted in four ways – i.e. by its materials and systems, the social interactions, the institutions involved and the surrounding ideologies. They clarify that any literacy practice has a material history, which is found in the writing materials, systems and the material traces they leave. Furthermore, literacy practices socially evolve through interactions, possess institutional histories and are bound to certain ideological considerations that shape these material, interactional and institutional histories (refer section 2.2.2.1).

Moreover, Rassool (1999:5) describes literacy as “being instrumental in framing the range of knowledge and skills that are valued and accredited within particular societies.” Notions of what it means to be literate are therefore based on different sets of social, functional, economic, ideological and political structures – what can be described as culture. These structures (or culture) in turn influence the range and type of resources available to teaching and learning. This symbiotic relationship results in an educational framework or culture that affects how, what and who can be taught literacy and knowledge.

As a case in point, workplace literacy development is situated in TVET colleges<sup>12</sup> (as educational institutions) and development in students (potential graduates) is to be facilitated at all levels of college life through formal curriculum delivery, but literacy practices will also manifest in college culture and student activities. The multiplicity of literacy events depends on the institutional culture and literacy mediators (who could be lecturing staff, fellow students, work mentors and so on). Literacy development is further guided by and situated in the standardised prescripts in the curricula that are forward designed (refer sections 1.6.4.1. and 3.1).

#### **2.4.3 Literacy as applied and functional practice**

Since literacy is neither a static concept nor a unitary construct (Case, Ainsworth & Emerson, 2004:24; Street, 1984, 1988), it should be developed as multi-modal capabilities at an institution of learning (i.e. TVET college). Literacy development involves a continuum of application and learning of functional literacy practices to enable

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<sup>12</sup> The history and background of the TVET colleges is discussed at length in Chapter 1 – refer section 1.2.1.

individuals to achieve their goals, develop their knowledge and potential, and participate fully in community and wider society (UNESCO, 2005:21).

As said, literacy capabilities are developed through application in multiple contexts for different purposes and to perform various cultural and social functions. Functional literacy practice encompasses the integration of technology so as to use and produce of multi-modal texts which could be of linguistic, numeric, visual, audio, gestural or spatial design (Cope & Kalantzis, 2000:26–27). One designs, understands, interprets, creates, and communicates different multi-modal texts (written, spoken, visual, gestural) for purposes of study, work and/or lifelong development. As such, within these social practices and relationships mediated by literacy, a literate identity begins to emerge.

#### **2.4.4 Literacy as mastery and manifestation of literate identity and behaviour**

Next, there is not mere functional engagement in literacy practices, but literacy manifests as literate identity and capable behaviour. Mastery of literacy practices within sociocultural contexts implies using literacy appropriately and confidently for specific purposes and to the desired standard for performance. In this sense, reliance on mediation in the literacy event begins to diminish. As such, a literate identity is established and one is capable to dip appropriately and as needed into a wide and deep repertoire of literacy practices in order to carry out learning or productive work (Hull et al., 1996:197).

#### **2.4.5 Literacy as critical and transformative practice**

Literacy as mastered capability becomes about thriving in sociocultural contexts and implies having the confidence to use literacy critically for transformation. As such creative and transformative power, literacy manifests as critical and creative capability in what people can do with literacy. This means freedom and empowerment to choose how to utilise literacy, but also capability to critique the communities within which one has achieved literacy (Gee, 1996:xii; Gee et al., 1996).

In this layer, creativity is prevalent in literacy practices. This creative capacity – i.e. the ability to “move an idea from one state to another” (Jackson, 2006:8) – in literacy practices facilitates optimal performance in and with the complex social and cultural forms emerging as an effect of new interactive technologies. It is within this critical and transformative layer that one uses literacy practices knowledgeably and creatively not only for one’s own learning and development, but also for critical reflection and/or to advocate transformation in a literacy practice and broader society. Green (1988) aptly states, one does not merely participate in literacy practice and make meanings within it, but there is flexibility to critically and creatively produce or adapt literacy practice.

From the conceptualisation described in preceding paragraphs, a view of workplace literacy emerges as social and situated practices which, when applied and functional, evolve into mastery, thereby manifesting as literate identity and transformative and critical literate behaviour. The major manifestations of such workplace literate behaviour and identity include:

- (i) Being able to function and work in highly complex technological and digital environments, not only reading and writing per se.
- (ii) Using, interpreting and producing complex multi-modal texts for multiple purposes and functions.
- (iii) Accessing and converting information in various platforms into knowledge and productive work.
- (iv) Displaying flexibility and adaptability in literacy practices for study or work.
- (v) Demonstrating a critical consciousness and creativity in literacy practices and behaviour that result in further development and/or improvement of performance.

## 2.5 Literacy development and learning

In this section the relationship between literacy and learning and the factors that influence the development of workplace literacy capabilities are discussed.

### 2.5.1 Becoming literate while learning

Individuals become literate as they learn. In this regard, Olson and Torrance (2001) advocate the creation of literate societies in which the free exchange of text-based information is enabled and an array of opportunities for lifelong learning is provided. Literacy development therefore should be seen as an active and broad-based learning process (UNESCO, 2006:151), rather than the limited and shaped product of interested social action that emanates from powerful social institutions such as schools, workplace, churches and bureaucracies (Prinsloo & Breier, 1996). Genre theorists (refer Hyland, 2007; Martin, 1993; Martin & Rothery, 1993) further argue that certain groups and their characteristic genres enjoy more power and mastery, and successful use of these powerful genres (such as literacy) could – and should – be taught and learned by all in society (Lankshear & Knobel, 2003:14; Lankshear et al., 1997). To do so, Rassool (1999:44) proposes a cross-disciplinary approach to literacy development as literacy constitutes, simultaneously, a social practice, an ideological practice, a cultural practice and an educational practice.

Becoming literate encompasses notions of both sociocultural and cognitive processes (Cook-Gumperz, 1986; Hull et al., 1996; Rogers & Street, 2011). As a sociocultural practice, literacy is inextricably bound up with social,

institutional and cultural relationships, as well as creation of social identities within these relationships and contexts (Gee, 1996:xii). Gee (2011:xix) further explains that learning literacy is best seen not as a mental thing, but as a type of social interaction in which knowledge is distributed across people, as well as their tools and technologies, and stored in the links among people in such communities of practice. Gee in this regard reverberates Bourdieu's (1991) description of literacy practices as habitualised ways of meaning-making that give shape to specific literacy events and production, situated individual behaviour and interpersonal relations.

Moreover, Freire (1973) emphasises the importance of bringing the learner's sociocultural realities into the learning process itself and then using the learning process to challenge these social realities. Similarly would be true of literacy development. Freire and Macedo (1987) explain that speaking, reading and writing (literacy practices) are interconnected parts, not only of an active learning process, but also of social transformation. The words that people use in order to give meaning to their lives (i.e. reading the world) are in turn fashioned, created and conditioned by the world they inhabit (Freire & Macedo, 1995).

Viewing literacy practices essentially as social-interactional practices therefore necessitates a conceptual shift towards literacy development as guided learning – the latter concept first introduced by Vygotsky (1978, 1987). This conceptual shift introduces the notion of mediated learning and ongoing integration into a work-related practice in the development of literacy (Lave, 1988; Lave & Wenger, 1991; Rogoff, 2003; Rogoff & Lave, 1984). Lave and Wenger (1991:34–37) coined this mediated and guided learning practice as “legitimate peripheral participation”; in other words, a learning practice in which more competent members of professional communities guide new members or novices into communities of practice so as to become full participants in the world of work. In such guided learning, knowing is transformed into practice through mutual engagement, negotiation of meaning with others and shared repertoires within such a practice (Wenger, 1998). There is increasing evidence that this kind of collaborative engagement within literacy practices in workplaces allows for work to be better or more productively performed (Gee & Lankshear, 1997; Gowen, 1992; Hull et al., 1996; Kerka, 1995).

Literacy development is, Luke and Freebody (1999:2) summarise:

*not* about skill development, *not* about deep competence. It *is* about the institutional shaping of social practices and cultural resources, about inducting successive generations into particular cultural, normative ways of handling texts, and about access to technologies and artifacts (e.g. writing, the Internet) and to the social institutions where these tools and artifacts are used (e.g. workplaces, civic institutions) [italics in original].

Luke and Freebody (1999:4) further highlight three dimensions at play in the development of literacy capabilities: the breadth of an individual's or community's repertoire of literate practices (refer Olson & Torrance, 2001; UNESCO, 2013); the depth and degree of control exercised by an individual or community in any given literacy

activity and practice (refer Baynham & Prinsloo, 2008; Prinsloo & Breier, 1996); and the extent of hybridity, novelty, and redesign at work (refer Freire, 1973; Hull, 1997; Luke & Freebody, 1999). The situational factors influencing literacy development within these dimensions are briefly discussed in the next section.

## 2.5.2 Situational elements and factors influencing literacy development

As described in the previous section, literacy development at college is influenced by the scope and variety of literacy practices and events offered, the social and power relations at play (especially in critical and creative literacy practices), and the ability to transfer and transform literacy practices in and for a place of work.

Literacy as social and situated practice is developed within institutions such as schools and colleges through what Gee (1990, 1999) calls engagement in “secondary Discourses”. As such, a curriculum contains and maps out desired student performance and what the appropriate learning activities and assessments would be (Wiggins & McTighe, 2006:6). Edwards (2011:38–39) in this regard identifies certain factors (i.e. contextual, organisational, curriculum, micro-political and individual factors) that impact upon what happens when a curriculum is enacted; that is, when teaching and learning occur. Similarly, these factors play a role in terms of literacy development at college.

Contextual factors such as national policy and funding arrangements for example influence direction in a curriculum, which literacy practices are focal to be developed and how extensively curriculum offerings are resourced. Micro-political views (e.g. collegial, hierarchical or individualistic, or expectations of students and parents) impact how literacy and its value are perceived and what the priorities in a literacy curriculum should be.

Organisational elements such as the nature and size of institutions, styles of management and locus of decision-making influence the culture of teaching and learning. Billett (2001, 2006, 2009) in this regard observes that the manner in which individuals are permitted to engage in workplace activities, the kinds of activities they are able to practise and how they are supported are key to the quality of their learning. Therefore, the diversity and multiplicity of literacy events and practices in the enacted curriculum, as well as in college and student life, would influence literacy development. For example, there should be opportunities to engage in literacy practices in the classroom in a formalised manner, but also while taking part in student life. A student may be on the secretariat of the student representative council and could successfully master the practice of recording and writing minutes in this manner without ever being formally taught to do so.

Curriculum factors that impact learning and literacy development include, for example, how narrowly the curriculum is designed and focused, to what extent it is prescriptive and whether the assessments are mainly

internally or externally conducted. The pedagogical approach in the curriculum is also crucial so as to meaningfully integrate cognitive, emotional and social factors into an interdependent learning system.

Further, the nature of the literacy curriculum, be it academic or vocational, is an important consideration. Mikulecky and Drew (1991) emphasise the common belief that transfer of learning (and literacy practices in this case) from the classroom to the workplace is more likely when instruction is contextualised in job practices. However, the hypothesis that job literacy will increase more as a result of job-specific, rather than general, training has never been tested directly (Perin, 1997). On the other hand, in a view of literacy as situated and social practice, affording students contextualised work-related opportunities for literacy development and diversity in literacy events should yield positive results.

On a final note, individual factors such as the professional formation and dispositions of lecturers and teachers, and students' backgrounds and prior experiences play an important role in any learning and development. Hull (1997, 1999), Hull et al. (1996) and Scholtz and Prinsloo (2001) reiterate the view of Freire (1973) that the attitudes, values and beliefs of individuals engaging in literacy practices influence how and what they learn. The socio-economic factors influencing the predominantly black students at TVET colleges, as well as English being the language of instruction and their own proficiency in this language (a second or third language for almost all students) to learn and master literacy practices in English, cannot be ignored. These factors have a significant influence on access to literacy practices and the development of literacy as identity and behaviour. Therefore, literacy events as socio-interactive practices should take into account the prior knowledge, attitudes, values and beliefs of students in any such mediation of literacy development.

It should be noted that these factors are not inclusive of all that impacts learning, but they are important to consider to develop a pedagogy for workplace literacy instruction.

## **2.6 Conceptual framework for workplace literacy development at TVET colleges**

Since it is known what workplace literacy encompasses (refer sections 2.3 and 2.4) and which factors to consider in a pedagogy for developing workplace literacy (refer section 2.5), the conceptual framework in section 2.4 is revisited and adapted as a possible guide to develop such workplace literacy.

### **2.6.1 Translating concepts of literacy to the development of literacy**

As postulated in section 2.4.1, one of the premises for the conceptualisation of workplace literacy is the developmental model by Langer and Knefelkamp (2001) regarding the assimilated and progressive use of workplace literacy norms in five stages. The individual progresses from concept recognition of the literacies that are demanded in the workplace for capable functioning and multi-tasking to mastery and professional

independence. This progression is enabled and supported by multiple and diverse perspectives from co-workers and other mediators of learning and literacy development (Langer, 2003:322–324).

My conceptualisation of workplace literacy development at a TVET college similarly depicts such literacy development and workplace literacy acculturation (refer Figure 2.2). Workplace literacy develops in terms of this conceptualisation from cognition and application of functional workplace literacy practices to critical and transformative literate behaviour and a workplace-literate identity – further explanation follows the illustrated conceptual framework. Although the development of workplace literacy is depicted in layers evolving from concept recognition to independent mastery, the development is not linear. Rather, as layers evolve, more literacy capabilities are added, enabling one to reach to a “state of grace” in Scribner’s (1984) terms – free to act upon the world in which literacy plays a role.

It should also be noted that the elements of each developmental aspect formed the basis of the content analysis in Chapter 3.

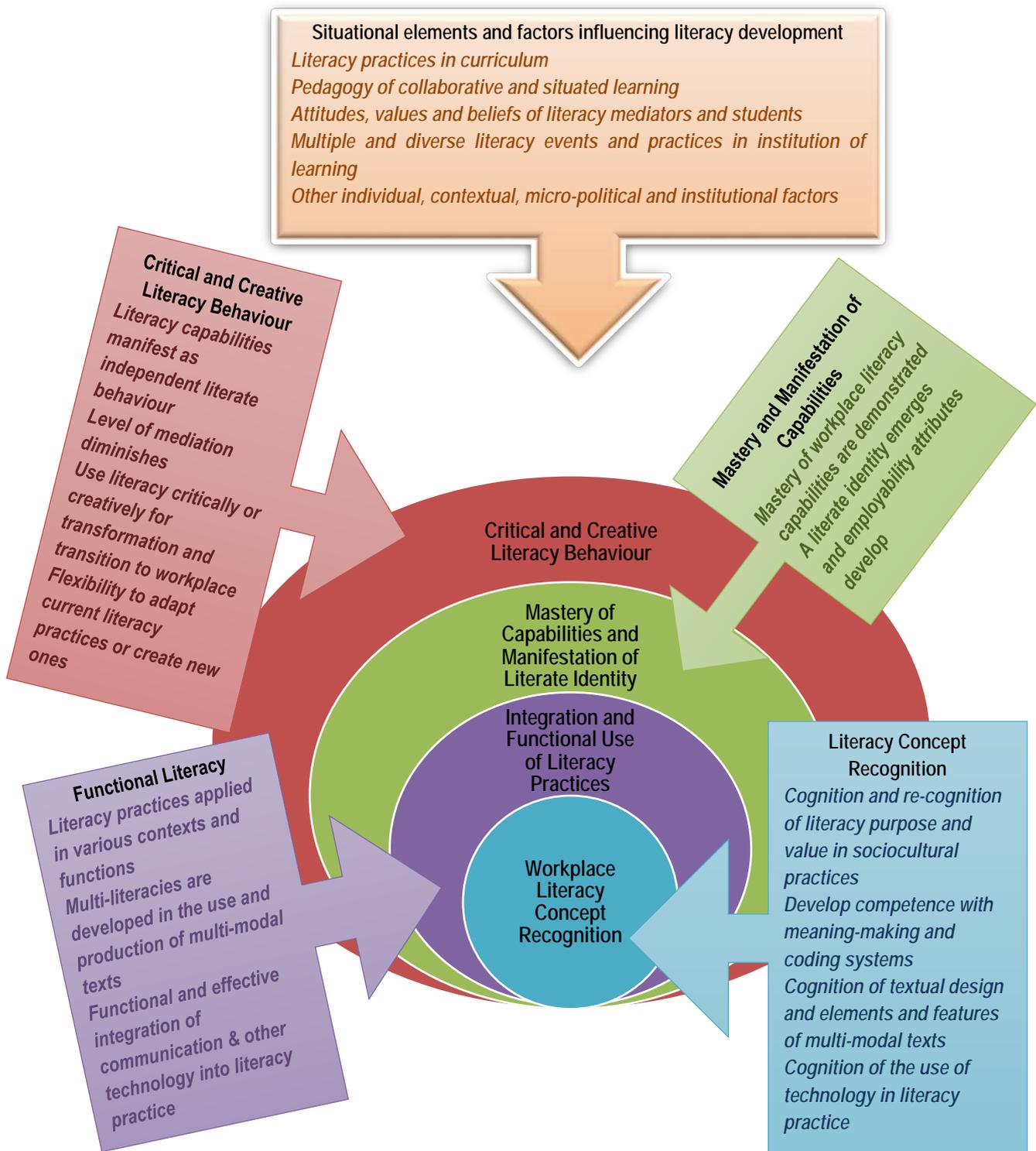


Figure 2.2: Conceptual map for workplace literacy development

## 2.6.2 Workplace literacy development as concept recognition

Within this developmental layer, students come to recognise what literacy they need in order to learn and develop at college, as well as which literacy competences are required for work and lifelong learning. Although there might be a distinct focus on literacy as a cognitive and technical enterprise when developing literacy concept recognition, literacy as sociocultural practice and its value-adding aspects are concurrently recognised. As such, cognition (awareness and understanding) and re-cognition (link to what is already known) of literacy concepts and practices are developed. For example, students would explore different investigative or research methods and the textual design features of such a report in a literacy and learning task and activity.

Competence with coding and/or meaning-making systems is initiated as students engage with multi-modal texts, ranging from verbal (spoken) and written texts to visual, digital and number texts. Students acquire competence (cognition) with texts of different design through re-cognition and analysis of the various elements and features in multi-modal texts. These features include linguistic or numeric (e.g. sentence structure, figurative language use, arithmetic operations and statistical tables), visual (e.g. signs, images, formatting, graphical representations), audio (e.g. music and sound effects, tone and loudness in voice), gestural (e.g. body language, posture, hand gestures) and spatial (e.g. spaces and gaps in texts, spatial organisation and layout) design elements (Cope & Kalantzis, 2000:26–27). For example, to do a PowerPoint presentation on a certain topic requires students to be aware of the design elements and features of such presentations as well as the purpose and context in which the presentation will be made.

Furthermore, awareness is created of the use of technology (communication and other technology such as the computer) so as to integrate technology into literacy practices. In the same example, students will also have to be familiar with the technology to be used (e.g. computer software, multimedia projector) and how to use these efficiently to complete the task.

## 2.6.3 Integration and functional use of workplace literacy practices

In this layer, students functionally apply technological and technical acumen and integrate different literacy capabilities, “multi-literacies” in Street’s (2006) sense, in varying contexts and activities. There is an established awareness of these sociocultural literacy practices as situated, allowing students to use literacy appropriately and effectively for communication and other literacy purposes in these contexts.

It is within this category that multi-modal meaning-making capabilities are refined. A mode, as defined by Street (2010:353), is a “regularised organised set of resources for meaning-making, which might include image, gaze, gesture, movement, music, speech, or writing amongst others.” There is engagement with multi-modal texts that are produced and utilised by literate individuals as well as comprehension of what these texts mean in

literate societies (Olson, 1994; Olson & Torrance, 2001, 2009). Literacy practices (as functional practices) develop in a dual manner, meaning that multi-modal texts are used and interpreted to produce and communicate such texts in turn.

Practically, following the example cited in section 2.6.2 above, in the literacy event (learning how to do a presentation), the lecturer (or mediator of literacy) uses various modes to communicate meaning: language, tone and emphasis in the voice, visuals such as a video clip or another PowerPoint presentation and gestures to demonstrate the basic principles of an effective presentation (the literacy practice). Students process the multi-modal information (i.e. comprehend and interpret the variety of linguistic, visual, audio and gestural meanings) and in turn demonstrate understanding by designing multi-modal texts and applying literacy practices, i.e. creating PowerPoint slides on a specific topic which they then present.

#### **2.6.4 Mastery of workplace literacy capabilities and manifestation of literate identity**

It is through the mastery of literacy practices in varying contexts that a literate identity as well as a growing self-esteem and confidence in relation to workplace literacy practices emerges. This identity is reflected in behaviour and capability to “dip appropriately and as needed into a wide and deep repertoire of literacy practices” in order to carry out learning or work-related activities (Hull et al., 1996:197). As a result, some desirable employability and worker attributes – those primarily mediated through literacy – develop. For example (refer section 2.3.2), one is able to conceptualise work in terms of its written (and other modal) representations (Hull, 1999, 2000) and to “master and manipulate the social rules that govern literate activities” in the workplace (Hull, Katz & Oren, 1996:197).

Using the example referred to in sections 2.6.2 and 2.6.3, students would be equally capable to craft a PowerPoint presentation, write a report or do a practical demonstration on a given topic. In each case, they would recognise and understand the differences in the design and features of the texts, understand what purpose literacy serves and adhere to the expected standard and requirements for performance.

#### **2.6.5 Critical and creative literacy behaviour**

In this development a literate identity as student or worker has been established and literacy is critically used to thrive in sociocultural contexts. This implies becoming able to make independent judgements about the appropriateness of literacy in varying contexts and meaning-making modes and mastered literacy capabilities to learn or do productive work increasingly manifest as independent literate behaviour. There is freedom and empowerment to choose how to utilise literacy, but also capability to critique the communities within which one has achieved literacy (Gee, 1996:xii; Gee et al., 1996). One displays confidence and flexibility (independence)

to use literacy knowledgably and creatively for one's own learning and development, but also for critical reflection and/or to advocate transformation in literacy or workplace practice.

Although literacy development remains a situated social practice, dependence on others for mediating literacy development gradually diminishes (but never disappears). Students critically and creatively engage in literacy practices in complex social and cultural forms with minimal or no guidance or mentoring. As such, they are able to transform or adapt current literacy and work practices or even create new ones (Green, 1988). For example, the Internet has opened up possibilities of a wide array of new literacy practices. These practices might not yet be formally incorporated into curriculum content, but because of familiarity and ease with using social networks and the Internet, students may be able to write a blog or even design a webpage as a work or learning task without being formally instructed how to do so.

## 2.7 Conclusion

In this chapter, different conceptualisations and perspectives on literacy and literacy development were explored. These views range from skills-based approaches in which there is strong emphasis on technical and cognitive competence in literacy development, to a more ideological view of literacy as situated and social practices with value-adding properties and potential to transform individual life, work practices and society. Furthermore, in a technologically-driven world and workplace, literacy implies the effective use and production of multi-modal texts for communication and other purposes. Literacy is therefore functional and serves various purposes, also in the workplace. It encompasses numeracy and mathematical literacy as well as the ability to access and process information in technology-rich environments for work and own development. International surveys measure literacy as such, that is, as literacy, numeracy and problem-solving in technology-rich environments.

Emerging from the analysis of these perspectives and ideological stances, as well as a model by Langer and Knefelkamp (2001), are the conceptual frameworks for workplace literacy (refer framework in section 2.4) and for developing such literacy at a TVET college (refer framework in section 2.6). Within these conceptualisations, literacy evolves from basic concept recognition of literacy purpose, textual features and the use of technology, to functional application of literacy practices in a variety of technology-rich contexts. Literacy also becomes mastery and independence in behaviour when a literate identity develops. Finally, literacy acts as transformative power when used critically and creatively. As such, literacy holds power and could enable transition to the workplace.

Given these conceptualisations, the next step would be to validate the affordances provided for workplace literacy development through a content analysis of a specific NCV programme curriculum. The results and findings of the content analysis are recorded and analysed in Chapter 3.

## CHAPTER 3: VALIDATION OF THE CONCEPTUAL FRAMEWORK OF WORKPLACE LITERACY DEVELOPMENT

- 3.1 Brief introduction to content analysis and sample
- 3.2 Coding scheme for workplace literacy development in terms of conceptual frame
- 3.3 Analysis of the focus and resourcing of the subjects
  - 3.3.1 Focus and subject level outcomes of the fundamental subjects
  - 3.3.2 Resource provision in the fundamental subjects
  - 3.3.3 Focus and subject level outcomes of the core subjects
  - 3.3.4 Resource provision of the core subjects
  - 3.3.5 Concluding remarks on focus and resourcing of subjects
- 3.4 Content analysis of curriculum documents – findings and discussion
  - 3.4.1 Instances for literacy concept recognition
    - 3.4.1.1 Findings
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  - 3.4.3 Instances for mastery of capabilities and manifestation of a literacy identity
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    - 3.4.4.1 Findings
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- 3.5 Analysis of learning outcome statements
  - 3.5.1 Summary findings of verbs used in learning outcome statements
  - 3.5.2 Comparison of denoted literacy practice in learning outcome statements
- 3.6 Summary of findings and concluding remarks

### 3.1 Brief introduction to content analysis and the sample

In this chapter, the conceptual framework for developing workplace literacy (refer framework in section 2.6) is used to analyse the affordances provided for in the curriculum of the selected NCV programme, Engineering and Related Design (refer to selection in section 1.6.3.1). The design and structure of the NCV qualification was described in section 1.6.3.1 and the curriculum documents that were analysed for this purpose are the subject and assessment guidelines of the three fundamental and three compulsory core subjects for the programme Engineering and Related Design. Since the seventh subject in the programme is an elective choice for specialisation purposes in the particular field of study, it was precluded from the analysis (refer the subject matrix included as Annexure A). Furthermore, only the level 4 curriculum documents were analysed because this is the desired exit level for the qualification. NCV level 4 is at the same NQF level as the National Senior Certificate qualification – commonly known as Grade 12.

The structural layout and format are similar in all six subject documents, though some subject documents include additional information such as teaching tips and a glossary. English First Additional Language is such an example. The curriculum content (refer definition in section 1.5.1) consists mainly of sets of knowledge, skills and competences, and values and attitudes. The intended curriculum is structured in topics and subject and learning outcomes to guide the enactment of the curriculum, while the assessment standards, tasks and activities guide the experienced curriculum in terms of assessment of achievement (Billett, 2006:2; Porter & Smithson, 2001).

Moreover, the three fundamental subjects in the programme were reviewed by the DHET for implementation in 2013. The review involved revision of the curriculum content as well as editing and refining the formulation of the subject and learning outcomes and assessment standards. Additional sections such as the tables for the internal continuous assessment (ICASS) in the respective assessment guidelines were also added to further improve these second-generation curriculum documents. However, for purposes of consistency and comparison, only those sections that are common and standard across all six subject documents were analysed.

Academic and other literacy practices have necessarily been ingrained in the predetermined curriculum content (refer Richards, 2013 and description of curriculum design in section 1.6.3.1), the learning of which is facilitated and mediated in classrooms and workshops as formal teaching and learning. These teaching and learning practices are situated in events where literacy plays a dominant role. For example, acquiring knowledge for or competence in a technical task such as fitting component parts together requires reading of the manual or instructions. Application of knowledge and capability is often demonstrated in writing tasks such as reports, projects and examinations. The acquisition of values and attitudes can be traced in the application of format and style conventions and adherence to workplace standards.

The analysis in terms of affordances (opportunities and provision – refer explanation in section 1.6.3.2) for literacy development was therefore directed at the focus, aims and subject level outcomes in the respective subject guidelines (refer introduction and section 2 in South Africa, 2007b, 2007d, 2007f, 2013b, 2014b, 2014d). In the introduction section, the importance and essence of the subject are defined and the link between the subject level outcomes and critical developmental outcomes<sup>13</sup> are explained. The resource requirements (refer section 8 in South Africa, 2007b, 2007d, 2007f, 2013b, 2014b, 2014d) and conditions or factors for success (refer section D of introduction in South Africa, 2007b, 2007d, 2007f, 2013b, 2014b, 2014d) were also included in the analysis, because it was expected that these would yield some description of literacy-rich (or poorly-resourced) environments.

The bulk of the analysis was directed in terms of the predetermined (refer forward design of curriculum in section 1.6.4.1) and detailed description of the subject and learning outcomes (refer section 7 in South Africa, 2007b, 2007d, 2007f, 2013b, 2014b, 2014d). The subject and learning outcomes yield insight into what is intended to be achieved in teaching and learning. The sections in the subject guidelines relating to the duration and tuition time of the curriculum, the assessment of the qualification and weighting of the topics, the calculation of the final mark and pass requirements are more generic qualification and policy statements (refer sections 1, 3 to 6 in South Africa, 2007b, 2007d, 2007f, 2013b, 2014b, 2014d). Subsequently, they were not included in the analysis.

In the assessment guidelines, the generic sections on assessment in sections A and B were not included in the analysis as these relate to general description of types of assessment, planning, methods and tools of assessment and collecting evidence and moderation practices, amongst others (South Africa, 2007a, 2007c, 2007e, 2013a, 2014a, 2014c). The detailed description of the assessment for each topic (refer section C in South Africa, 2007a, 2007c, 2007e, 2013a, 2014a, 2014c) in terms of the assessment standards and tasks or activities was included in the analysis – the latter includes theoretical written examinations, tests and practical tasks. The assessment standards and tasks provide clarity on what is evidence of acquired learning and/or literacy capability.

The analysis also included the sections (refer sections B2 and C4 in South Africa, 2007a, 2007c, 2007e, 2013a, 2014a, 2014c) on the internal and external assessment in the respective assessment guidelines. Knowledge, skills, values and attitudes are assessed throughout the year by means of projects, tests, assignments,

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<sup>13</sup> **Critical Cross-Field or Developmental Outcomes** (CCFOs) refer to those generic outcomes that inform all teaching and learning. For example, CCFOs may include working effectively with others as a member of a team, and/or collecting, analysing, organising and critically evaluating information. These CCFOs are compulsory to include in any qualification registered on the NQF. There are seven CCFOs, one relating directly to literacy – i.e. “Communicate effectively using visual, mathematics and language skills in the modes of oral and/or written presentations.”

investigations, role-play and case studies (refer assessment framework, section B2, in South Africa, 2007a, 2007c, 2007e, 2013a, 2014a, 2014c). The practical component of the ICASS is undertaken in a real workplace, a workshop or a structured environment. The structured environment, for the purpose of assessment, refers to an actual or simulated workplace or workshop environment where practical learning and assessment are to be facilitated. All ICASS evidence is kept in a portfolio of evidence and must be readily available for monitoring, moderation and verification purposes. The structure and compilation of this portfolio are prescribed and guided. The external summative assessment comprises theoretical examination papers so as to assess achievement of the subject and learning outcomes. These examinations are administered according to relevant assessment policies and requirements. For the vocational core subjects, there is also an integrated summative assessment task (ISAT) that, together with the national examination, constitutes the external assessment. This summative task, which is a practical assessment task, yields insight into affordances that link work practice to the academic theory taught in class.

Prior to the analysis, the four coding categories and sub-categories (refer section 3.2 for detailed description) were defined. The coding categories were derived from the developmental aspects of literacy (i.e. concept recognition, integration and functional application, mastery and literate identity, and independent literacy behaviour) depicted in the conceptual framework (refer section 2.6). The sub-categories relate to the elements of literacy practice (i.e. situated and social, applied and functional, mastery of literacy capabilities, and critical and creative literate behaviour). They were depicted in the conceptual frameworks on workplace literacy and the development thereof (refer sections 2.4 and 2.6). The identified content in the subject and assessment guidelines was then analysed in terms of the affordances detected for workplace literacy development for each developmental aspect and its elements. These examples or occurrences were recorded as instances (refer Annexure B for data set and explanation of instances in section 1.6.3.2). Key words (likely to be verbs) and phrases were traced, or alternatively the learning outcome or assessment statement was interpreted co-textually in terms of an affordance for literacy development. The part of the outcome or statement that relates to development of literacy practices is underlined.

It was expected that the fundamental subjects (English, Mathematics and Life Orientation), by focus and nature of their content, should have ample affordances to develop key aspects of language literacy, numeracy and computer capabilities. Therefore, in all of the analyses conducted, a comparison was drawn between workplace literacy development in the fundamental subjects and how it is developed in the core subjects. Furthermore, in the initial stages of analysis, the different verbs used in the learning outcome statements were particularly noticeable and were recorded for further consideration. In each instance, the literacy practice was identified with the use of a particular verb and the frequency of its use was recorded. The underlying premise is that these literacy practices will be used and applied when the curriculum is enacted. It was tested whether certain verbs

have a stronger link to literacy practices and whether the frequency of their use differs in core and fundamental subjects.

In the next section, a detailed description follows of the categories and sub-categories for analysis in terms of the conceptual frameworks in sections 2.4 and 2.6.

### 3.2 Coding scheme for workplace literacy development in terms of conceptual frame

The aspects of workplace literacy development, which were used to trace affordances in the curriculum documents, are defined in the next paragraphs on the basis of the conceptual framework discussed in section 2.6. In each case, questions relating to the elements of literacy practice (conceptualised in sections 2.4 and 2.6) were formulated to trace the affordances offered in the curriculum - these signify the opportunities for literacy development. These questions serve as sub-categories in the analysis.

The first developmental aspect and category, **concept recognition** (refer section 2.6.2), represents the capacity to learn and develop literacy capability (cognition) and re-cognise (link to what one already knows) what literacy is key for studies at college and in the workplace. Concepts of the value of literacy are developed through recognising its purpose in particular contexts (refer to the ideological view of literacy as situated and sociocultural practice in section 2.2.2.1).

During the concept recognition, students begin to develop capability (and even technical competence) with coding or meaning-making systems as they engage with multi-modal texts, ranging from verbal (spoken) and written texts to visual and mathematical texts. However, literacy is developed more broadly than reading and writing texts (though this forms a major part of academic literacy capabilities) and encompasses being able to employ various modes of meaning-making in the use and production of texts. This means students acquire capability (cognition) with textual design through re-cognition and analysis of design elements and features in multi-modal texts. These multi-modal designs include linguistic or numeric (e.g. sentence structure, figures of speech, arithmetic operations and geometric figures, digital code), visual (e.g. signs, images, formatting and graphical representations), audio (e.g. tone and loudness in voice, music and sound effects), gestural (e.g. body language, posture, gestures) and spatial (e.g. spaces and gaps in texts, spatial organisation and layout in different contexts) elements and features (refer multi-modalities by Cope & Kalantzis in section 2.2.2.2).

Awareness is also created of the use of technology (communication and computer technologies) so as to integrate technology in literacy practices (refer the importance of the use of technology in a technology-driven workplace in section 2.3.2). While there might be a distinct focus on developing cognitive and technical literacy competence such as reading and writing, literacy as situated sociocultural practice and its value-adding aspects in situations and contexts where literacy plays a role are concurrently recognised (refer sections 2.3.2 and 2.4.2).

Given this description, the following questions emerged from the conceptual frameworks in sections 2.4 and 2.6 as elements and practices of this developmental literacy layer. These questions served to detect the affordances in the curriculum content for developing literacy concept recognition.

Is there affordance in the intended curriculum:

- To create awareness of literacy purpose and value created, both at college and in a workplace?
- For cognition and re-cognition of literacy practice created in context (i.e. college and work)?
- For cognition and re-cognition of the design and features of multi-modal texts made possible? (This awareness relates to the conventions, e.g. format, style, structural features, that apply while creating texts in context.)
- To develop cognition of using communication and computer technologies while engaging in literacy practices?

During the **integration and functional application** (refer section 2.6.3) of literacy practices, literacy is augmented in that students use literacy for different purposes in a variety of functions – ‘multiple literacies’ in Street’s (1984) sense (refer explanation in section 2.2.2.1). Students demonstrate cultural and context acumen when integrating multi-modal capabilities (refer perspectives of Street in section 2.2.2.1 and Cope & Kalantzis in section 2.2.2.2) and texts in multiple contexts and literacy events. The functional and effective use of communication and computer technologies is demonstrated in technological and digital environments.

Given this description, the following questions emerged from the conceptual frameworks in sections 2.4 and 2.6 as elements and practices of this development of literacy. These questions served to detect the affordances in the curriculum content for integration and functional use of literacy.

Is there affordance in the intended curriculum to:

- Apply a literacy practice in and across different contexts?
- Use and integrate multi-modal texts (linguistic or numeric, visual, spoken, body language, spaces and distances, etc.)?
- Produce multi-modal texts (linguistic or numeric, visual, spoken, etc.)?
- Effectively integrate technology in literacy practices for communication and other functional purposes?

**Mastered literacy capabilities** to learn or do productive work increasingly manifest as literate identity and behaviour (refer section 2.6.4). Students access and convert information from various platforms into knowledge and productive work. Mastery means students are capable to make independent judgements about the

appropriateness of literacy in varying contexts and meaning-making modes. They can “dip appropriately and as needed into a wide and deep repertoire of literacy practices” in order to carry out learning or work-related activities (Hull et al., 1996:197). As a result, some desirable employability and work attributes – those primarily mediated through literacy – develop. These relate to communication, the ability to think and do work critically, using language and literacy functionally (e.g. effective writing and reading), and effective utilisation of communication and information technologies for work or study purposes (refer section 1.2.3.3).

Given this description, the following questions emerged from the conceptual frameworks in sections 2.4 and 2.6 as elements and practices of this development of literacy. These questions served to detect the affordances in the curriculum content for mastery of capabilities and manifestation of a literate identity.

Is there affordance in the intended curriculum to:

- Demonstrate mastered capabilities as a literate identity?
- Demonstrate employability and work attributes in literacy practices?
- Reveal sensitivity to work process flow and standards for performance in literacy practice?
- Work increasingly without guidance or mediation when engaging in literacy practices?

**Critical and creative literacy behaviour** (refer section 2.6.5) implies using literacy capabilities for critical reflection so as to transform literate behaviour (refer literacy as critical and transformative practice in section 2.4.5). Literacy and information capabilities are critically used to bring about change in own learning and development and for transition to the workplace (Gee et al., 1996). A literate identity as student or worker has been firmly established and literacy is creatively used to thrive in sociocultural contexts.

This developmental aspect implies freedom and empowerment to choose how to utilise literacy, as well as capability to critique the communities within which one has achieved literacy (Gee, 1996:xii; Gee et al., 1996). It further means having the confidence and flexibility (independence) to use literacy knowledgably and creatively for one’s own purposes and work or study. Students creatively engage in literacy practices in complex social and cultural forms (refer distinctions of creativity in section 1.5.1) so as to transform or adapt current practices, or even create new literacy practices (Green, 1988).

Students engage in workplace literacy and information processing practices independently with minimal or no guidance or mentoring. Although literacy development remains a situated social practice, dependence on others for mediating literacy development gradually diminishes (but never disappears) as students prepare for transition to the workplace.

Given this description, the following questions emerged from the conceptual frameworks in sections 2.4 and 2.6 as elements and practices of this development of literacy. These questions served to detect the affordances in the curriculum content for manifestation of critical and creative literacy behaviour.

Is there affordance in the intended curriculum:

- To apply objective or critical literacy practices (at college and in the workplace)?
- To creatively engage with complex social and cultural forms?
- To transform or adapt literacy practices for transition to the workplace? (This means there is an element in the curriculum that requires adapting academic literacy practices for workplace contexts.)
- To allow students to engage in literacy and information practices without guiding prescripts in terms of design and expected performance? (This means minimal or no supervision is required for literacy practices.)

In the next section, the focal point of the respective subjects as described in their introductory sections is analysed. The premise directing the analysis was that, should there be direct reference to literacy practices, then there would be affordances for literacy development in the subject. In addition, the resource requirements for each subject were analysed so as to determine to what extent these resources will contribute to create and enable literacy-rich environments. This was the first step to analysis.

### 3.3 Analysis of the focus and resourcing of the subjects

In the fundamental subjects (i.e. English, Mathematics and Life Orientation), by focus and nature of their content, ample affordances to develop key aspects of literacy, numeracy and computer competences were expected. Especially in Life Orientation, a clear and contextualised link to the workplace and employability was detected. The reason for this is because of the main intent to develop life skills (conceptualised as employability skills in section 1.2.3.3) and competence with ICT. For the subjects English and Mathematics, a strong focus on literacy and numeracy exists. These focal points, however, do not guarantee that lecturers or facilitators would develop literacy and numeracy practices related to and situated in workplace contexts and not teach curriculum content for the sake of language and mathematics per se.

The aims in the core subjects relate to developing essential vocational competences with regard to the specific vocational programme – Engineering and Related Design. The vocational core subjects contain the key knowledge, skills and attitudes applicable for work in the specific vocational field. As such, the assumption was that obvious opportunities for developing literacy, numeracy and employability competences would not be as

ample as in the fundamental subjects. It was expected that and tested whether a clear link to workplace contexts exists and that literacy development could be situated as such.

### 3.3.1 Focus and subject level outcomes of the fundamental subjects

The purpose of the subject **English First Additional Language (EFAL)** is set to be effective language use so as to enable and empower students to acquire knowledge, express themselves (communication), interact with others and manage their world. As such, the following competences and content are taught, which are also the identified topics in the curriculum: Listening and Speaking; Reading and Viewing; Writing and Presenting; and Language and Communication in Practice (South Africa, 2014b:2).

The subject level outcomes (refer South Africa, 2014b:5) also identify critical language awareness and advanced cognitive language skills as key focal points. The bulk of this subject curriculum is therefore made up of those competences that students would need to engage in synthesis and evaluation of information in various forms and contexts for both academic and functional purposes. The subject further aims to prepare students to express and justify, orally and in writing, their own ideas, views and emotions confidently so as to become independent and analytical thinkers. Furthermore, students are guided in using English to express their opinions on ethical issues and values in their critical interaction with a wide range of texts.

#### **Analysis of EFAL focus and subject level outcomes:**

Already in the EFAL purpose statement (South Africa, 2014b:2), the link with functional literacy is clearly defined. Furthermore, in the subject level and focus statements (South Africa, 2014b:5), academic literacy is emphasised in outcomes such as develop “cognitive language skills”, “express and justify, orally and in writing, views and emotions” and to synthesise and evaluate information for “both academic and functional purposes.” More importantly, critical awareness of language use is (a literacy practice) is foregrounded in the engagement with a wide range of texts.

The following broader outcomes for the subject are envisaged. These outcomes firmly establish a link with the conceptualised developmental aspects of literacy (refer framework in section 2.6), ranging from concept recognition to critical language use and literate behaviour (refer South Africa, 2014b:2):

- “Acquire the language skills necessary to communicate accurately and appropriately taking into account audience, purpose and context” [signifies concept recognition of literacy context and applied literacy practices in terms of communication].
- “Use their Additional Language for academic learning across the curriculum” [signifies functional and applied language and literacy practices].

- "Listen, speak, read, view, write and present the language with confidence and enjoyment" [signifies functional use of language and literacy at mastery level].
- "Express and justify, orally and in writing, their own ideas, views and emotions confidently in order to become independent and analytical thinkers" [signifies functional use of language and literacy at mastery level].
- "Use their Additional Language and their imagination to find out more about themselves and the world around them. This will enable them to express their experiences and findings about the world orally and in writing" [signifies functional and applied language and literacy practices].
- "Use their Additional Language to access and manage information for learning across the curriculum and in a wide range of other contexts. Information literacy is a vital skill in the 'information age' and forms the basis for lifelong learning" [signifies concept recognition of literacy context and applied and functional information literacy practices].
- "Use their Additional Language as a means of critical and creative thinking: for expressing their opinions on ethical issues and values; for interacting critically with a wide range of texts; for challenging the perspectives, values and power relations embedded in texts; and for reading texts for various purposes, such as enjoyment, research and critique" [signifies concept recognition of literacy purpose, applied literacy practices in terms of communication of ideas and opinions and reading of multi-modal texts, as well as critical and creative literacy practices].

The link between the critical developmental outcomes and workplace literacy development is clear (South Africa, 2014b:3). These affordances would provide opportunities to develop literacy at functional and application level, as well as to master multi-modal capabilities so that a literate identity could emerge. For example, there are affordances for students:

- to identify and solve problems in oral, reading and writing activities;
- to work effectively with others in team activities, discussions and research projects;
- to develop language and communication proficiency across contexts and fields of study; and
- to use science and technology effectively and critically to access and present texts.

Students are also afforded engagement with different texts for personal development, to acquire life skills and for the learning process.

As explained in the purpose statement in the introduction (refer South Africa, 2013b:2), **Mathematics (Math)** "enables creative and logical reasoning about problems in the physical and social world. Knowledge in the mathematical sciences is constructed through the establishment of descriptive, numerical and symbolic relationships." It is through this knowledge and problem-solving that students could learn to understand the

world and use that understanding to “confidently deal with Mathematics as and when it affects their daily lives, their community and the world in general.”

Furthermore, the subject level outcomes (refer South Africa, 2013b:4) relate to performing advanced operations on complex numbers, using complex numbers and mathematical disciplines (algebra, statistics and graphs, geometry, trigonometry, and probability models) in a variety of contexts (e.g. statistics, graphical representations), to “plan and control financial instruments” and solve problems.

### **Analysis of Math focus and subject level outcomes:**

The focal point in the subject Mathematics appears to be the development of numeracy, which is conceptualised as capabilities to access, use, interpret and communicate mathematical information and ideas in order to engage in and manage the mathematical demands of a range of situations in adult life (refer definition of numeracy in section 1.5.4). The subject level outcomes (South Africa, 2013b:4) make mention of a number of mathematical disciplines (e.g. algebra, geometry, trigonometry) which, if not contextualised in the physical and social world, will not result in students confidently dealing with mathematics as and when it affects their daily lives.

In addition, the following broader outcomes are envisaged. These outcomes firmly establish a link with the conceptualised developmental aspects of literacy (refer framework in section 2.6), ranging from concept recognition of literacy purpose to applied and critical numeracy and literacy practices (South Africa, 2013b:2):

- “Communicate appropriately using descriptions in words, graphs, symbols, tables and diagrams” [signifies functional and applied literacy (and numeracy) practices].
- “Use mathematical process skills to identify, pose and solve problems creatively and critically” [signifies functional and critical literacy (and numeracy) practices].
- “Collect, analyse and organise quantitative data to evaluate and comment on conclusions” [signifies functional and critical literacy (and numeracy) practices].
- “Engage responsibly with quantitative arguments relating to local, national and global issues” [signifies concept recognition of literacy (and numeracy) purpose and functional and applied practice in engagement with quantitative texts].

The link between the critical developmental outcomes and workplace literacy development is clear (South Africa, 2013b:2). There are affordances to apply numeracy and mathematical practices to solve problems, to use visual, symbolic and/or language skills in various modes to communicate effectively, and to manage and process information in research and reporting practices.

The purpose of **Life Orientation (LO)** is to enhance “students’ possibilities to achieve success in their vocational studies as well as in life” (South Africa, 2014d:2). The subject consists of a combination of life skills and ICT

competences, and includes essential topics such as personal and career development, health and wellbeing, citizenship, learning skills and basic computer applications. The content of the first four topics generally relates to development of employability attributes (refer frameworks in section 1.2.3.3) other than the ICT competences dealt with in topics 5 to 9. Set as a requirement for contextualising and integrating the life skills or employability component with the ICT skills section, the content matter used for applying ICT skills must be based on the content matter of the first four topics. Assessments should not use unrelated texts and content outside of this curriculum. For example, when creating and editing a Word document, the content matter of the text could be, for example, road safety (in the life skills section).

### **Analysis of LO focus and subject level outcomes:**

The purpose statements and inclusion of information and computer technologies relate this subject strongly to employability attributes and technological literacy. In the introduction, it is stated that the aim of the subject is to holistically develop individuals (students) so that they are able to apply these life skills in the workplace and life (South Africa, 2014d:2). Since many of these life skills centre around competences with learning, managing individual growth, life and citizenship, as well as managing ICT, literacy practices would play a substantial role and would be developed as such.

In addition (South Africa, 2014d:4-5), the following subject level outcomes are envisaged. These outcomes firmly establish a link with the conceptualised developmental aspect of literacy (refer section 2.6):

- “Revise and refine personal development plan (PDP) in terms of chosen career path, while compiling job application documents and preparing for the interview process” [signifies functional and applied literacy practice].
- “Apply advanced cognitive skills and strategies in various contexts and apply examination writing skills” [signifies functional and applied literacy practice].
- “Manage stress and depression to maintain a balanced lifestyle, and advocate road safety measures” [implies functional and applied literacy practice in the compilation of stress management plans and advocacy campaign for road safety].
- “Apply advanced computer skills in a Microsoft Office programme” [signifies functional and applied literacy practice, especially with regard to the integration of technology].
- “Use the internet as a communication medium” [signifies functional and applied literacy practice, especially with regard to the integration of technology].

The link between the critical developmental outcomes and workplace literacy development is clear (South Africa, 2014d:3). These affordances would provide opportunities to develop literacy at functional and application level, but also to master multi-modal capabilities so that a literate identity could emerge. For example, there are

affordances for students to communicate effectively and collect, organise and present relevant information; to engage with science and technology when using the computer; and to work effectively with others as members of a team and responsible citizens when discussing and investigating matters relating to life in local, national and global communities.

### 3.3.2 Resource provision in the fundamental subjects

The resources for teaching and learning are indicative of the affordances for creating literacy-rich and enabling environments. The table below reflects the instances found in section 8 in the subject guidelines of each of the three fundamental subjects (South Africa, 2013b, 2014b, 2014d).

**Table 3.1: Recommended resources for fundamental subjects**

<p><b>EFAL</b></p>	<p>Support of teaching and learning and literacy development could be detected in physical resource requirements such as language and reading laboratories (electronic and/or paper-based), resources/media centres, computer rooms with Internet access, and simulation centres (practical rooms, office hubs and/or reception areas) equipped with fax machines, computers, copiers and printers. Recommended equipment resources include tape recorders with microphone, television and DVD player, and a data projector. Learning and teaching materials that are required include textbooks, dictionaries – preferably one per student for home use and one set of 30 per class, newspapers, magazines and posters, DVDs, CDs and software programs for reading and language (South Africa, 2014b:13-14).</p> <p>In addition, language and computer laboratories and communication simulation centres, a variety of teaching aids and text types to facilitate learning, adopting a communicative approach to facilitate learning in language and grammar, and lecturers contextualising generic knowledge, skills, values and attitudes are some of the enabling factors proposed for effective teaching and learning (South Africa, 2014b:3).</p> <p>All of these resource requirements and enabling factors should support the development of language proficiency and functional literacy if meaningfully incorporated into learning and literacy practices.</p>
<p><b>Math</b></p>	<p>Support of teaching and learning and numeracy development could be detected in physical resource requirements such as scientific calculators, textbooks and workbooks, computer and printing facilities, applicable graphing software, geometric sets, current newspapers and information about financial packages from banks and investment companies, Internet access or access to a good library or resource centre, as well as materials to build or create models (South Africa, 2013b:13-14).</p> <p>In addition, it is proposed that a learning enabling environment for Math is created by, among others, practical and relevant examples so that students can apply abstract concepts in real everyday life situations (South Africa, 2013b:2).</p>

	All of these resource requirements should support the development of functional literacy, inclusive of numeracy, if meaningfully incorporated into learning and literacy practices.
LO	<p>Support of teaching and learning and employability skills development could be detected in physical resource requirements such as LO classrooms equipped with notice boards, resources/media centres with Internet access and suitably equipped computer rooms with Internet access. Learning and teaching materials include student textbooks and lecturer guides, as well as newspapers, magazines and posters. Other resources relate to exposure to particular experiences in the community, social and workplace contexts that will create a real context within which student projects can unfold (South Africa, 2014d:15).</p> <p>In addition, it is recommended that an enabling environment for LO, among others, is well-resourced, the subject is offered in an innovative, interactive and exciting way so as to enable students' full participation and enjoyment of this subject, and the students are exposed to real community and social issues that will create a realistic context within which their projects can unfold ( South Africa, 2014d:2).</p> <p>All of these resource requirements should support the development of employability attributes, inclusive of computer literacy, if meaningfully incorporated into learning and literacy practices.</p>

The conclusion about how the subject level focus and resourcing in the fundamental subjects contribute to develop literacy or provide affordances is discussed in section 3.3.5.

### 3.3.3 Focus and subject level outcomes of the core subjects

**Applied Engineering Technology (AET)** relates to the “achievement of design gained through the evaluation and monitoring of component manufacture by modern technological equipment in the workplace and so allowing new methodology to be developed” (South Africa, 2007b:2). The focus of this subject is on design texts and to “analyse mechanical engineering processes in order to diagnose and solve problems systematically” (South Africa, 2007b:3). As such, the expectation is that affordances for literacy development would reside in the development of competences with multi-modal texts, i.e. design texts as such, while working with technology in an engineering manufacturing work environment.

#### Analysis of AET focus and critical developmental outcomes:

The subject purpose includes (South Africa, 2007b:2):

considerations of flow and handling of materials; automatic machines; management techniques to reduce work content and ineffective time; movements of workers in the shop; factory organisation; design and location of a factory; the elements of costs; factory organisation in conjunction with the costing system;

purchasing procedure; stores routine (buying and store keeping); labour (employment, time-keeping and time-booking, methods of remuneration); wages; overheads (depreciation and interest on capital); contract costs; factory job cost accounting; estimating and planning; personnel administration; incentive schemes.

All of these elements denote literacy practices at play, though the links are implied. For example, administering personnel implies reading and studying personnel records (written texts), dealing with costs relates to applying accounting practices, and movements of workers and materials in factory organisation signifies dealing with visual texts and plans, flow diagrams etc.

Furthermore, the subject is said to be important because of the focus on the identification and selection of materials for the manufacture of products and determination of relevant manufacturing processes to make the products (South Africa, 2007b:2). Again, literacy practices, which become clear in the analysis of the learning outcomes in section 3.4, are implied. These practices relate strongly to using and producing multi-modal texts such as digital design texts. The two critical and developmental outcomes in the subject with a clear link to workplace literacy development are effective communication and the effective use of science and technology (South Africa, 2007b:2).

The focal point in **Engineering Processes (EP)** is the same as in Applied Engineering Technology, but the subject content relates more to the use of “mechanical engineering tools, equipment, methods and processes to produce and assemble components” (South Africa, 2007d:3). As such, the expectation is that affordances for literacy development would reside in the engagement with multi-modal texts such as engineering designs and component manuals.

#### **Analysis of EP focus and critical developmental outcomes:**

The focus and importance of this subject as well as the link to the critical developmental outcomes are the same as for Applied Engineering Technology - therefore refer the analysis in the preceding paragraph.

**Professional Engineering Practice (PEP)** introduces students to the “code of ethics in the engineering world of work” through exploration of the engineering profession and its role, the role of engineering professional bodies as well as the impact of engineering on both society and the environment. It further introduces students to effective communication through graphics, drawings and graphs, but also embeds the basics of computer programming and small-scale computer aided design (South Africa, 2007f:2). The subject level focus is to apply professional conduct and principles in engineering work contexts with a focus on environmental sensitivity and sustainability (South Africa, 2007f:3). As such, the expectation is that affordances for literacy development would reside in the engagement with multi-modal texts such as engineering sketches, drawings, graphs, and safety

laws and regulations as well as working with technology in an ethical and sustainable manner in an engineering work environment.

### Analysis of PEP focus and critical developmental outcomes:

The importance of this subject resides in its focus on the “engineering world of work, code of ethics, roles of professional bodies, as well as the impact of engineering in both the society and the environment” (South Africa, 2007f:2). Therefore, literacy practices centre on dealing with written texts such as laws and legislation, and communication practices such as creating and reading verbal (oral and written) texts, and working with graphics and drawings.

The link between the subject outcomes, the critical developmental outcomes and literacy development is made clear in the introduction section (South Africa, 2007f:2):

The subject improves the problem solving skills through the use of technology. The students develop critical thinking skills by taking constructive decisions on issues that affect society and the environment. The ethical behaviour of students and their sense of responsibility are enhanced as they learn to adhere to the prescribed code of ethics in engineering. Students’ communication skills improve through their making presentations and writing reports.

Literacy practices (e.g. use of technology, reading and interpreting texts and effective communication) are to be applied functionally when learning and, more importantly, with desirable employability attitudes such as ethical work conduct.

### 3.3.4 Resource provision in the core subjects

The resources for teaching and learning are indicative of the affordances for creating literacy-rich and enabling environments. Table 3.2 below reflects the instances as such in the curriculum documents of the three core subjects.

**Table 3.2: Recommended resources for core subjects**

AET	Learning support materials and resources are needed for both academic and practical aspects of learning. These include comprehensive texts for student use as well as for supplementary reading; learning materials for projection during lectures; facilities to support the promotion of opportunities for research by both students and lecturers; educational tours to relevant learning venues; educational and motivational talks from industry; visual and audio-visual materials; relevant workshop manuals and documentation; and models and demonstrations (South Africa, 2007b:8). In addition, the application of knowledge to working situations is
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	<p>set as an important requirement for creating an enabling environment for Applied Engineering Technology (South Africa, 2007b:2).</p> <p>All of these resource requirements should support the development of functional literacy in an engineering design work environment.</p>
EP	<p>Learning materials must cater for both academic and practical aspects of learning. Available materials need to address these aspects: texts that fully address the task; workshop manuals and texts for the theoretical knowledge; computer literacy; learning materials using projection equipment; visual and audio-visual material; promotion of research; educational tours to relevant learning venues; educational and motivational talks from industry; and models and demonstrations (South Africa, 2007d:9). In addition, the application of knowledge to working situations is set as an important requirement for creating an enabling environment for Engineering Processes (South Africa, 2007d:2).</p> <p>All of these resource requirements should support the development of functional literacy in an engineering manufacturing work environment.</p>
PEP	<p>Only physical resources were indicated and no reference was made to learning support materials and resources. This could simply be a technical omission (South Africa, 2007f:8).</p> <p>In addition, it is proposed a learning enabling environment for Professional Engineering Practice is created by, among others, a centre with computers loaded with the relevant software and plotters, as well as practical and relevant examples so that students can apply abstract concepts in real everyday life situations (South Africa, 2007f:2).</p>

The conclusion about how the subject level focus and resourcing in the core subjects contribute to developing literacy or provide affordances therefore is discussed in section 3.3.5.

### 3.3.5 Concluding remarks on focus and resourcing of subjects

In the focal points of all subjects, there is a distinctive link to functional and applied literacy practices such as reading and interpreting multi-modal texts and academic literacy practices, for example writing tests and doing projects. There is also reference to critical and creative literacy practices, such as expressing opinions, ideas and views in a multi-modal manner. Integration of technology (especially computer technology) in literacy practices and work is standard in the subject level and critical and developmental outcomes, as are communication and other key employability competences such as teamwork, critical thinking and problem-solving.

Resourcing of the subjects should support literacy development and create literacy-enabling environments, especially when these aim to simulate the real workplace context and practice. However, since these outcomes and resource requirements form part of the intended curriculum, there is no guarantee that this will be the practice in reality.

In the next section, a detailed content analysis of the learning outcomes is conducted. Any affordances detected would be to develop workplace literacy in a teaching and learning environment in a classroom or workshop.

### 3.4 Content analysis of curriculum documents – findings and discussion

As expounded in sections 3.1 and 3.2 and Annexure B, analysis of the curriculum content was directed in terms of the developmental aspects and elements of workplace literacy as conceptualised and described in sections 2.4 and 2.6. The first analysis (refer section 3.3) was directed to detect affordances for literacy development in the aims, focus and subject level outcomes in the respective subject guidelines (refer introduction and section 2 in South Africa, 2007b, 2007d, 2007f, 2013b, 2014b, 2014d).

The next analysis was directed to the predetermined outcomes (i.e. subject and learning outcomes) as well as the assessment standards, activities and tasks. These outcomes and standards play a critical role in teaching and learning practices. The instances for workplace literacy development found in these subject outcomes and assessment standards were counted and recorded. In the counting, should the same instance have appeared more than once in different curriculum statements, it was recorded as such.

In the summary tables for each analysis of a developmental aspect, a comparison was drawn between the subjects in terms of the highest number of instances for that aspect. Afterwards, percentages were calculated to determine the weighting of the specific developmental aspect. The identified instances in the text from the respective subject and assessment guidelines are attached as Annexure B.

The questions forming the basis for the discussion and comparison between the fundamental and core subjects in the analysis are:

- (i) For each subject, how many instances for workplace literacy development have been recorded?
- (ii) Is there a difference between the fundamental and core subjects in terms of the affordances for workplace literacy development?
- (iii) Can it be detected whether affordances relate more to development of workplace literacy practices or are indicative of academic literacy practices?

### 3.4.1 Instances for literacy concept recognition

The methodology to determine the instances for this developmental aspect (i.e. concept recognition) was to track key words (mainly verbs) and phrases that relate to the questions posed (refer the elements of the concept recognition in section 3.2). These would be words and phrases such as “aware”, “context”, “situation”, “purpose of .....(literacy)<sup>14</sup>”, “features of .....(texts)<sup>15</sup>”, “design of (texts)”, “understand”, and “realise”.

#### 3.4.1.1 Findings

Thirty-one instances were detected to develop literacy concept recognition in the fundamental subject **English First Additional Language** (refer Annexure B). This number constitutes 23% of the total recorded instances for this subject (refer Table 3.3). Concept recognition of workplace literacy purpose is developed in identifying the purposes of verbal (spoken), written and other multi-modal texts in listening and speaking (literacy) practices such as speaking, listening for and responding to various purposes and audiences (six statements). The purpose of reading and creative texts (e.g. novels, job advertisements, job-finding correspondence and curriculum vitae, letters to the press, newspaper or magazine columns and/or articles, other media texts, proposals, and film or other reviews) is also explored. Concept cognition of workplace literacy in context is created by using language and literacy to speak, listen and respond and write in various in diverse contexts (10 statements).

Affordances for developing concept recognition of textual features are provided in that the design and features of verbal (spoken), written, creative and multi-media texts are read, viewed and explored. These features include elements such as format, layout, use of colour, meaning, message, value and purpose in reading and creative texts. Awareness is also created of elements such as film genres; background, timeline and setting; plot and sub-plots; themes; characterisation; use of colour and lighting; dialogue, music and sound effects; camera angles, shots and movement; framing and composition; and foregrounding and backgrounding by reading, viewing and exploring these multimedia texts. Strategies and styles of creative, reflective, media and planning texts are also explored in reading and viewing activities. The capability to use language structures and grammar conventions correctly, make predictions, write appropriately, and express appreciation and enjoyment are also indicative of concept development in this regard (15 statements). No instances could be traced for developing concept recognition in terms of integration of technology into literacy practice.

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<sup>14</sup> Instead might be a reference to a literacy practice such writing, drawing graphs, preparing a speech, conducting research etc.

<sup>15</sup> Instead might be reference to an actual text such a Word document, job contract, statistical sample etc.

There are 11 detected instances to develop numeracy (as an aspect of and complementary to literacy) concept recognition in the fundamental subject **Mathematics** (refer Annexure B). This constitutes 10% of the total recorded findings (refer Table 3.3). Concept recognition is developed in terms of workplace literacy purpose by using mathematics “to plan and control financial instruments” (one statement). Contexts and processes that develop concept recognition in terms of numeracy and literacy use relate to statistical analysis, financial planning, data processing, and dealing with probability and prediction (six statements). There are four recorded instances that relate to exploring the characteristics of mathematical texts in respect of graphs, algebraic functions and numeric summaries. No instances could be traced for developing concept recognition in terms of integration of technology into literacy practice.

There are 33 detected instances for developing literacy concept recognition and computer literacy as an aspect thereof in the fundamental subject **Life Orientation** (refer Annexure B). This number constitutes 23% of the total recorded findings (refer Table 3.3). Computer literacy is a focal point in this subject and is understood as the capability to use computer software to create digital texts as well as to use the Internet, social media and networks for various information processing purposes.

Computer literacy is to be developed within the contexts and assignments of the first four topics which relate to personal development, learning and cognitive skills, health and wellbeing, and citizenship (six statements). For example, awareness of literacy purpose is created in activities such as using the Internet for the job application process and for social communication purposes (four statements). Cognition of literacy in context is developed in contextual situations such as interviews, the social computer environment (Facebook, Twitter, blogs, Mxit, Skype, YouTube) and using the features of Microsoft Office such as Word and Excel for study purposes (eight statements). Affordances (18 statements) are also provided for exploring and re-cognising the features mostly of digital texts such as Word documents, Excel spreadsheets and Access database tables and reports, and web and social media pages, as well as other texts such as a job contract. There are three recorded instances for identifying the use of technology (computer) within literacy practice, for example using search engines in research activities and using the Internet for various online applications and social communication.

Literacy concept recognition in the core subject **Applied Engineering Technology** is developed in terms of recognising the purpose of literacy in relation to safety in work practices by demarcating the location of machines and walkways (two statements). Six instances have been found for developing awareness in terms of the specifications and conventions relating to design texts. These features relate to manufacturer’s specifications, corrective notes, as well as notes regarding control system components and structure, material/s, and the construction process. There are eight instances in total, constituting 11% of the total recorded findings (refer Annexure B and Table 3.3). No explicit instances could be traced for developing concept recognition in terms of contextual application and integration of technology into literacy practice.

In the core subject **Engineering Processes**, 21 recorded instances relate to literacy concept recognition development (refer Annexure B). This number constitutes 13% of the total recorded findings (refer Table 3.3). Literacy concept development ranges from awareness of what literacy will be required for specific tasks and include activities such as identifying materials and components with a tag or note (six statements) to understanding and following verbal (spoken) and written instructions for engineering-related tasks (three statements). For example, literacy is used to identify component parts and lay them out in the correct order for assembly, implying that students will engage in reading instructions or follow a diagram or sketch. Awareness of the design and features of texts is to be created in identifying such in verbal (spoken or written) instructions, technical reports, sketches, graphs and drawing information (four statements). Cognition of technology in terms of literacy practice is also to be developed in activities such as selecting and navigating a program in computer-aided machining (CAM) to set up a machine and prepare for an engineering process (eight statements).

There are 20 learning and assessment activities and tasks in the core subject **Professional Engineering Practice** that relate to development of literacy concept recognition (refer Annexure B). This constitutes 41% of the total recorded findings (refer Table 3.3). Awareness of literacy purpose is created in terms of using reporting, graphics and drawings for communication purposes (two statements). Contextual awareness is implied in these two statements, though this was not recorded as such. Cognition and re-cognition of the features of technical sketches or drawings, graphs, block diagrams, flow charts and/or logical networks are developed through presentations and projects (nine statements). Engagement with textual conventions is provided for in the task to compile a technical report. Cognition of technology in literacy practice is embedded in the understanding of different computer hardware devices and their functions in the engineering field as well as computer languages and software systems (nine statements).

#### 3.4.1.2 Discussion of analysis – literacy concept recognition

Table 3.3 summarises the recorded findings for literacy concept recognition and its elements – i.e. concept recognition of literacy purpose and use in diverse contexts, features and design of multi-modal texts and the integration of technology into literacy practice (refer questions in section 3.2).

**Table 3.3: Summary of findings for literacy concept recognition**

Concept Recognition	EFAL	Math	LO	AET	EP	PEP
Purpose	6	1	4	2	6	2
Context	10	6	8	0	3	0
Textual features	15	4	18	6	4	9
Technology	0	0	3	0	8	9
<b>Total</b>	<b>31</b>	<b>11</b>	<b>33</b>	<b>8</b>	<b>21</b>	<b>20</b>
% <sup>16</sup>	23%	10%	23%	11%	13%	41%
	<b>AVG % Fundamental</b>	<b>19%</b>		<b>AVG % Core</b>	<b>22%</b>	

The fundamental subjects with the highest number of instances recorded in this layer, literacy concept recognition, is Life Orientation (33 instances). The core subject Professional Engineering Practice has the highest percentage of instances (41%) recorded in this category. The total number of recorded instances for literacy concept recognition in the fundamental subjects is 75, while there are 49 recorded instances in the core subjects. It therefore appears there are more affordances created for literacy concept recognition in the fundamental subjects than in the core subjects. On the other hand, the average percentage of instances recorded for literacy concept recognition is 22% for the core subjects. This is to be interpreted that developing literacy concepts is slightly more emphasised (by a margin of 3%) in the core subjects - indicated by the weighting expressed in the percentages.

The stronger emphasis on literacy context and purpose in the fundamental subjects could be because these subjects' content constitutes the generic basis of learning and development (i.e. English language proficiency, mathematical processes, and the use of the computer and software applications in study and work). Given that, in terms of the conceptualisation (refer conceptual framework in section 2.4), any literacy practice must be situated and contextualised, it is important to develop concept recognition in this regard. This appears to be achieved in the fundamental subjects. On the other hand, by nature of their workplace-related content, the core subjects already relate to workplace contexts, e.g. engineering processes, applied engineering technology and professional engineering practice. The curriculum statements do not, however, always specify these contexts in the envisaged literacy and learning practices.

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<sup>16</sup> Calculated as: (number of instances for this developmental aspect/total number of instances recorded for the subject)\*100

The strongest emphasis in developing literacy concept recognition is in terms of document literacy and textual design. In the fundamental subjects, the design and features of verbal (spoken), written, creative and multimedia texts, inclusive of mathematical and digital texts, are to be explored in teaching and learning activities such as formatting spreadsheets and Word documents, using software programme features such as mail merge, organising and interpreting data in graphical representations and numerical summaries, and viewing and exploring multimedia texts with attention to format, layout, use of colour, meaning, message and purpose. The texts in the core subjects include technical sketches or drawings, graphs, block diagrams, flow charts, logical networks, engineering designs and manuals, which are the textual types students would most likely encounter in the workplace. Dealing with these textual features at college would most likely prepare students for handling similar texts in the workplace.

The relevance of certain literacy concepts for workplace literacy in the fundamental subjects English and Mathematics could be questioned. For example, concept recognition of the purpose and design or features of certain creative and visual texts such as film and cartoons and algebraic functions may not be of use for a student in the programme Engineering and Related Design. Since these are fundamental subjects and compulsory to be included as per the qualification design, this seemingly irrelevant content might apply to other programmes as well.

The sub-category (or element) with the lowest number of recorded instances is developing the concept of integration of technology into literacy practice. This lack of literacy concept development could potentially hamper successful integration of technology into literacy practices, which is an essential aspect of modern-day work.

Literacy concept recognition is an important foundation for literacy practices to evolve into creative and critical workplace literate behaviour. This implies that lecturers should relate workplace literacy concept recognition in the fundamental subjects to such literacy practices in the core subjects. Workplace literacy practices should be recognised as contextualised and situated for developing integration of literacy practice into work and studies, which is discussed next.

### **3.4.2 Instances for integration and functional application of literacy practices**

The methodology to determine the instances for this developmental aspect (i.e. integration and functional use of literacy) was to track key words (mainly verbs) and phrases that relate to the questions posed (refer the elements of this aspect in section 3.2). These would be words and phrases such as “apply”, “perform”,

“calculate”, “draw”, “use ..... multi-modal (texts)”<sup>17</sup>, “produce ....multi-modal (texts)”, and “use .....(technology)”<sup>18</sup>.

In addition, in this part of the analysis, I attempted to distinguish between learning and assessment activities that strongly relate to the functional use of literacy which can be replicated in the workplace and those more applicable to academic literacy practices, such as reading texts and answering questions, writing tests and examinations, preparing a speech on a topic and doing a listening comprehension. Typically, verbs such as “explain”, “discuss”, “read”, “write” and “understand” are used in this regard, although their use is not exclusive to academic practices. Therefore, not to present a skew perspective in terms of affordances for workplace literacy development, I counted such mainly academic literacy practices only once or as a group.

### 3.4.2.1 Findings

Affordances in the fundamental subject **English First Additional Language** to develop and integrate functional literacy practices relate to using language and literacy for academic learning across the curriculum and to expressing experiences and findings about the world orally and in writing (refer Annexure B). Applying literacy practices (35 statements) is evident in learning and assessment activities. These activities include taking and reviewing notes, making summaries, answering questions critically, researching and organising ideas and information, speaking in a variety of contexts, reading and viewing texts at whole-text level, and writing and presenting texts for a wide range of purposes and audiences, using appropriate and the correct style, conventions, language and grammar.

The multi-modal documents that are to be used (read, viewed, analysed and interrogated) and produced in this regard include media and job interviews, news and/or other media reports, creative texts such as films and/or novels, proposals and/or advertisements, a curriculum vitae, letters to the press, newspaper or magazine editorials and/or articles, film or other reviews, and photographs, pictures, illustrations and cartoons (24 statements). There is one instance recorded to integrate technology into literacy practice, namely, to navigate the Internet to access texts regarding current events as well as use a computer to compile and present texts. There are 60 instances detected within this developmental aspect, which constitutes 45% of the total recorded findings (refer Table 3.4).

Functional literacy and numeracy are emphasised in the introduction to and subject level outcomes of **Mathematics** in that capability should be developed to communicate appropriately using descriptions in words,

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<sup>17</sup> Instead might be reference to an actual text such a spreadsheet, design, graphical representation, interview questions etc.

<sup>18</sup> Instead might be reference to actual technology such as a computer or a cutting machine.

graphs, symbols, tables and diagrams. Numeracy is to be developed to some extent at technical level, as the learning and assessment activities reflect. Students are to perform mathematical functions and operations in different contexts and use mathematical process to identify, pose and solve problems creatively and critically (64 statements). These learning and assessment activities range from very academic practice oriented instances to ones relating to workplace literacy practices (refer Annexure B). Academic literacy practices focus on developing technical understanding and capabilities with mathematical process, models and functions, for example working with complex numbers and algebraic expressions, using integrals and integration rules to analyse and represent mathematical and contextual situations, deriving and applying equations from the Cartesian coordinate system, as well as applying theorems of circles and trigonometric models. Workplace literacy and numeracy are developed where there is a distinctive link with workplace or real-life contexts in the curriculum statements. These include activities such as representing, analysing and interpreting data using various techniques, calculating the variance and standard deviation in a data analysis, clearly communicating predictions based on validated experimental or theoretical probabilities, and using mathematics to plan and control finances, e.g. applying growth and decay formulae in calculations and interpreting tax tables .

Sixteen statements relate to the critical engagement to solve problems with multi-modal texts such as graphs, diagrams, geometric figures and data tables, and students are expected to produce such texts in return (nine statements). There is no recorded instance for integrating technology into literacy practices. There are 89 instances recorded to develop numeracy as an aspect of and complement to literacy. This number constitutes 81% of the total recorded findings (refer Table 3.4).

There is a distinct focus in the fundamental subject **Life Orientation** on integrating technology (proficiency with computer software and digital texts) into functional literacy practices – 96 instances in total recorded (refer Annexure B). Affordances are provided to apply literacy practices in learning and assessment by doing assignments and projects, preparing for examinations, and reading case studies, scenarios and legislative texts (17 statements). Students compile documents such as a personal development plan, a job application toolkit, a nutritional plan for people living with HIV and AIDS, and action plans to manage stress. Students also engage in activities such as analysing case studies and scenarios to report, present and make recommendations on specific life-related topics, for example human rights, road accidents, the cost of a raising a baby, and HIV and AIDS.

The multi-modal documents to be used and produced include a personal development plan and job application documents, as well as documents relating to organising a blood drive, a road safety campaign and an election, such as graphs to show the link between traffic accidents and alcohol abuse, election posters and ballot papers, election reports and presentations, and a short video clip (20 statements). There are 59 recorded instances for developing and integrating technology into functional literacy practices. These include affordances to develop

technical competence with the computer – creating, editing and printing Word and Excel documents, using formulae in Excel, creating charts, as well as recording information in a database and printing a report. There are also affordances provided for other literacy competences in terms of using the Internet – these are: posting job applications online, running an online helpline, sending emails, and creating webpages and blogs. The number of instances recorded for this layer constitutes 66% of the total recorded findings (refer Table 3.4).

Forty-two instances were recorded in the core subject **Applied Engineering Technology** for developing functional literacy and integrating it into work practice (refer Annexure B). This constitutes 60% of the total recorded findings (refer Table 3.4). There is application of functional literacy practices (12 statements) in that students have to explain engineering concepts through demonstration, written texts or sketches and drawings. For example, students carry out a diagnostic analysis on mechanical equipment and report the findings, demarcate the location of machines and walkways by placing warning and informative signs, perform and apply calculations and their representation in a prototype design, apply new design concepts onto an illustrative plan, as well as record and analyse test results after testing a prototype.

The multi-modal texts that are to be used and produced (30 statements) relate to designs and prototypes and include illustrative plans, diagrams, sketches and calculations. For example, students interpret illustrations and create a new prototype design; test the prototype against the given specifications of the design problem and identify modifications; sketch an illustrative plan with new design concepts added and practically demonstrate safety procedures. No instance was recorded of integration of technology such as machinery into literacy practices, although there is an element of scientific and technological principle embedded in the construction of design texts.

There are 76 recorded instances (refer Annexure B) in the core subject **Engineering Processes** for integration of functional literacy practices, which constitutes 48% of the total recorded findings (refer Table 3.4). Application and integration of functional literacy practices (15 statements) relate to recording service information, reading and interpreting information in a component manual, checking and running assembly of parts, recording results after testing or checks for non-conformance, as well as following verbal or written instructions in accordance with workplace procedures.

There are affordances for active engagement with multi-modal texts (15 statements), which range from verbal (spoken), written, digital and mathematical texts to visual texts such as diagrams and sketches. Students have to be able to read specifications to configure a machine and set it up, simulate and test the machining process, and record readings. In turn, multi-modal texts are to be produced (four statements), such as a set of instructions and a process flow for machining a product. There are 42 statements that reflect integration of technology and literacy practices in activities and tasks such as reading specifications and designs; configuring the machine by

selecting the necessary post processor, tools and order of operation; testing the programme to suit material type and composition by running simulations; making corrections; and executing a machine-aided engineering task such as cutting machine parts.

In the introduction sections to the core subjects Applied Engineering Technology and Engineering Processes (South Africa, 2007b:2, 2007d:2), reference is made to the flow and handling of materials, movements of workers in the shop, factory design and organisational aspects such as purchasing procedure, stores routine (buying and storekeeping), accounting practices (wages, overheads, depreciation and interest on capital, job costs), and contracts. All of these work practices imply functional application of literacy practices. However, in the topic statements as well as the subject and learning outcomes of Applied Engineering Technology, there is no evidence of including these practices and content matter. There is some reference to the flow and handling of materials in the subject Engineering Processes. There seems to be a misalignment between the aims set in the subjects' focus and the curriculum statements for learning and assessment.

There are 25 instances for the development and integration of functional literacy practices in the core subject **Professional Engineering Practice** (refer Annexure B). This constitutes 51% of the total recorded findings (refer Table 3.4). Applying verbal (speaking) and writing academic literacy practices is evident in the frequent use of verbs such as "explain", "discuss" and "define". However, communication practices are also to be developed in activities such as the provision of after-sales services and compilation of a technical report (four statements). Multi-modal texts that are used and produced for interpretation and performing work-related tasks include presentations (e.g. demonstrate understanding of a given sketch, drawing or graph), small-scale models, block diagrams, flow charts, logical networks and comprehensive technical reports (14 statements). Instances for integration of technology and literacy practice are detected in activities such as performing simple structured programming for engineering design purposes as well as using computer software to produce spreadsheets, graphics and drawings (seven statements).

#### 3.4.2.2 Discussion of analysis – integration and functional application of literacy practices

Table 3.4 summarises the recorded findings for integration and functional application of literacy practices, i.e. application of literacy practices in context, using and producing multi-modal texts in context and integrate technology into literacy practices (refer questions in section 3.2).

**Table 3.4: Summary of findings for functional literacy application and integration**

Integration	EFAL	Math	LO	AET	EP	PEP
Application	35	64	17	12	15	4
Use of texts	15	16	5	12	15	1
Produce texts	9	9	15	18	4	13
Integrate technology	1	0	59	0	42	7
<b>Total</b>	<b>60</b>	<b>89</b>	<b>96</b>	<b>42</b>	<b>76</b>	<b>25</b>
% <sup>19</sup>	45%	81%	66%	60%	48%	51%
	<b>AVG % Fundamental</b>	<b>64%</b>		<b>AVG % Core</b>	<b>53%</b>	

The subject with the highest number of instances recorded for literacy practice integration and application is Life Orientation (96 instances). Mathematics has the highest percentage of instances recorded in this layer. Overall, a high number of instances for all the subjects was recorded in this aspect, except for the core subject Professional Engineering Practice. The average percentage of recorded instances for the fundamental subjects is higher (at 64%) than for the core subjects (53%). The higher number of recorded instances (245 in the fundamental subjects vs 143 in the core subjects) and the greater weighting (attached to the higher average percentage of recorded instances) imply that in the fundamental subjects there is greater emphasis on functional literacy development.

In addition, at times in the analysis of the functional use and integration of literacy, it was difficult to distinguish between statements relating to the development of academic literacy practices (i.e. those that support facilitation of teaching, learning and assessment, and which predominantly relate to listening, reading and writing practices) and those that sediment workplace literacy practices. This was encountered especially in the subjects Mathematics and Professional Engineering Practice. Should literacy or numeracy practices not be clearly contextualised so that learning is situated (refer argument for situated learning in sections 2.4.2 and 2.5), then the link to workplace literacy development is unclear.

Furthermore, at times in the analysis of the fundamental subjects' content, it was difficult to distinguish what is development of proficiency with language, mathematical process and technical computer skill and what is workplace literacy and numeracy development. A possible explanation could lie in the generic focus and content of the fundamental subjects as foundation for technical skills development – the latter is the domain and focus

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<sup>19</sup> Calculated as: (number of instances for this developmental aspect/total number of instances recorded for the subject)\*100

of the core subjects (refer focus of the subjects in section 3.3). With the analysis of the verbs used in learning outcome statements (refer analysis in section 3.5), this matter was further examined. In the analysis in section 3.5, I differentiated between the frequency and use in the core and fundamental subjects of verbs that typically signify academic literacy practices and levels of cognition development (Bloom, Engelhart, Furst, Hill & Krathwohl, 1956) and those with a distinctive link to workplace literacy development.

The opportunities to use and produce multi-modal texts are substantial (132 statements in total in all the subjects) and range from interaction with written linguistic (e.g. novels, articles, manuals, webpages) and number (e.g. data tables, digital readings) texts to more visual texts (e.g. graphs, geometric figures, diagrams, sketches, photographs and film). Students are often required to produce the same kind of texts in turn. There is also engagement with a number of verbal (oral and spoken) texts in both the fundamental and core subjects. This engagement relates to developing listening and speaking capabilities (English Language), while in the core subjects explanation, presentation or demonstration of knowledge or skill is often required, which could be in verbal (spoken) and/or written modes.

The lowest number of instances recorded fall in the sub-category for the integration of technology into literacy practice. In this respect, the subjects Life Orientation and Engineering Processes show a high number of recorded instances. The reason for this is the focus on developing competence with computers and software applications. The competences in Life Orientation are more generic, such as browsing the Internet and working with the Microsoft Office suite of applications, while in Engineering Processes they relate to setting up and configuring a machine to aid an engineering work process such as machining parts.

Overall, the highest number of recorded instances in this layer relates to the integration and functional use of literacy practices. There are ample affordances in the curriculum to develop academic literacy practices such as reading, viewing, writing, speaking and listening; to use and produce a number of multi-modal texts in learning and work-related tasks; and to functionally integrate technology into literacy practices. But the development of these functional literacy and numeracy practices should be clearly contextualised and relate to workplace contexts. In this regard, it has been noted that the affordances for workplace literacy development in the core subjects are more workplace contextualised than in the fundamental subjects (refer recorded findings in Annexure B).

For literacy to be developed to a mastery and confidence level means there should be ample opportunities to apply literacy practices practically and functionally. This appears to be case in the content analysis thus far. Next, I describe the kind of affordances provided for mastery of literacy competence and manifestation of a literate identity.

### 3.4.3 Instances for mastery of capabilities and manifestation of literate identity

The methodology to determine the instances for this developmental aspect (i.e. mastery of literacy capabilities and manifestation of literate identity) was to track key words (mainly verbs) and phrases that relate to the questions posed (refer the elements of this aspect in section 3.2). These would be words and phrases such as “show”, “demonstrate”, “perform literacy (task/practice)<sup>20</sup> with confidence or effectively”, “perform .....according to (standard)<sup>21</sup>”, “effective communication” or any instance in which diminished mediation is implied.

The employability and work attributes to be developed and tracked include communication, the ability to think and do work critically, mastery of effective writing and reading practices and using communication and information technologies for work or study purposes (refer section 1.2.3.3).

#### 3.4.3.1 Findings

Instances in the fundamental subject **English First Additional Language** to establish literate identity and behaviour relate to listening to, speaking, reading, viewing, writing and presenting texts with confidence and enjoyment. There are 21 detected instances in this category, which constitutes 16% of the total recorded findings (refer Annexure B and Table 3.5). These instances relate to establishing a literate identity in terms of using language and literacy with confidence as ingrained behaviour (more than mere functional use) while engaging in listening, speaking, reading, viewing and writing practices (10 statements). Further indicative signs of identity in literacy practice are opportunities to express appreciation and enjoyment of a number of creative and multi-modal texts, providing constructive feedback to other speakers, and reflecting on and improving one’s performance by incorporating feedback into one’s work. Three statements relate to using strategies for effective oral, non-verbal and other communication, which is an essential employability attribute. The use of correct language and grammar structures as well as conventions and formats appropriate to diverse contexts (eight statements) was interpreted as developing sensitivity to work process and standards. No instance for diminished mediation and supervision of literacy development could be found.

Five instances were detected for the fundamental subject **Mathematics**, which constitutes 5% of the total recorded findings (refer Annexure B and Table 3.5). These statements relate to the justification of the use of statistics to solve problems and take resolutions and as such are indicative of literate identity and confidence in literacy (numeracy) practice. Effective communication is an employability skill and two instances were found -

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<sup>20</sup> Instead might be reference to actual practice such as reading, writing, compiling, configuring or programming machines, drawing sketches etc.

<sup>21</sup> Instead might be reference to workplace requirements or specifications, process flow or procedures

students have to clearly communicate results of experiments correctly in terms of real context. No affordances for sensitivity to workplace practices or standards and diminished mediation and supervision of literacy development could be traced.

Although there is a strong link with employability skills and the workplace in the fundamental subject **Life Orientation**, the connection resides more in the content of the nine topics than establishing a literate identity and developing literacy practices in accordance with workplace requirements and standards. Only six instances could be traced (refer Annexure B) and they all relate to employability in terms of drafting a personal development plan so as to plan how to continue developing employability and job market-related skillsets. No other instances were recorded and the number of instances for this developmental aspect constitutes only 4% of the total number recorded findings (refer Table 3.5).

There are 18 learning and assessment activities and tasks in the core subject **Applied Engineering Technology** that relate to affordances to develop literacy practices in accordance with work processes (refer Annexure B). These instances include constructing and modifying prototypes for mechanical engineering processes as well as demonstrating safety procedures in work practices. Activities and tasks mostly relate to checking and evaluating prototype designs for conformity to specifications and to solve the given design problems – this denotes some sense of the analysis and critical evaluation mentioned in the introduction to the subject (South Africa, 2007b:2). These activities require application of functional literacy practices such as reading prototype designs in order to test or modify designs and using signs to demarcate a work area for safety purposes. Twenty-six percent of instances overall recorded findings fall into this category (refer Table 3.5).

The 61 instances recorded in the core subject **Engineering Processes** relate to the development of employability attributes and sensitivity to workplace requirements and standards for machining and component manufacturing (refer Annexure B). Employability as key competence is developed in activities for understanding and communication of verbal instructions (two statements). Learning and assessment activities include checking or verifying compliance to work procedure, specifications or requirements when performing engineering work tasks such as machining, cutting and joining component parts, as well as cleaning and storing machine parts (59 statements). To be able to perform to the standard expressed in the specifications, procedures or requirements implies application of functional literacy practices such as identifying components by tagging them, reading and using an array of multi-modal texts as well as recording digital information. Thirty-nine percent of the total instances recorded instances fall into this category (refer Table 3.5).

Affordance to develop sensitivity to work process in the subject **Professional Engineering Practice** is provided for in one statement: “possible environmental problems resulting from engineering are identified and solutions recommended” (refer Annexure B). No other instances were recorded (refer Table 3.5). To some extent, the

various learning and assessment activities, including the discussion, definition and explanation of ethical and professional conduct (refer findings in section 3.4.2.1 and analysis in Annexure B) relate to the general focus of the subject, namely, to apply professional conduct and principles in Engineering and Related Design, and imply sensitivity to workplace standard. Two percent of the total recorded instances fall into this category (refer Table 3.5).

### 3.4.3.2 Discussion of analysis – mastery of capabilities and manifestation of literate identity

Table 3.5 summarises the recorded findings for this aspect of workplace literacy developments and its elements, namely, mastery of literacy capabilities and manifestation of literate identity, employability and work attributes demonstrated in literacy practices, sensitivity to work process flow and standard for performance in literacy practices, and the diminished need for mediation of literacy practices (refer questions in section 3.2).

**Table 3.5: Summary of findings for mastery and manifestation of a literate identity**

Mastery	EFAL	Math	LO	AET	EP	PEP
Literate identity	10	3	0	0	0	0
Employability attributes	3	2	6	0	2	0
Sensitivity to workplace	8	0	0	18	59	1
Supervision	0	0	0	0	0	0
<b>Total</b>	<b>21</b>	<b>5</b>	<b>6</b>	<b>18</b>	<b>61</b>	<b>1</b>
<b>%<sup>22</sup></b>	<b>16%</b>	<b>5%</b>	<b>4%</b>	<b>26%</b>	<b>39%</b>	<b>2%</b>
	<b>AVG % Fundamental</b>	<b>8%</b>		<b>AVG % Core</b>	<b>22%</b>	

The subject with the highest number and percentage recorded for developing a workplace-literate identity is Engineering Processes (refer Table 3.5). The main reason for this is the number of instances that demonstrate sensitivity to workplace requirements or standards in literacy practice. Eighteen instances were also recorded in this sub-category for the core subject Applied Engineering Technology. These affordances also relate to checking that designs conform to the specifications or problem statements. Sensitivity of literacy practice to workplace procedure is often implied in the learning task and work activity – for example in activities to use and produce design texts, record and use digital information in computer-aided machining, and reading the problem

<sup>22</sup> Calculated as: (number of instances for this developmental aspect/total number of instances recorded for the subject) \* 100

statement and design correctly for adjustment of the prototype to the specifications. The eight instances detected in the subject English First Additional Language in this regard all relate to correct and appropriate language and literacy use in diverse contexts which, if properly contextualised, should lead to mastery in terms of workplace standards and conventions in literacy practices.

The average percentage of recorded instances in this layer for the core subjects is substantially higher (at 22%) than the average for the fundamental subjects (8%). The higher number of recorded instances (80 in the core subjects vs 32 in the fundamental subjects) and the greater weighting (attached to the higher average percentage of recorded instances) imply that, in the core subjects, there is greater emphasis on establishing a workplace-literate identity. This could be the case because of the workplace contextualisation (refer findings in section 3.4.3.1).

The instances (10 statements) detected as indicative of an emerging literate identity in the mastery of functional literacy capabilities were only detected in the subjects English First Additional Language and Mathematics. These affordances relate to mastery of literacy capabilities in terms of listening, speaking, reading, viewing, writing and presenting multi-modal texts with confidence and enjoyment. The statements in Mathematics relate to the justification of the use of statistics to solve problems and take resolutions and, as such, they are indicative of literate identity and confidence in literacy (numeracy) practice. These are crucial literacy capabilities to be applied in both learning and workplace contexts and should require very little mediation (if any). However, this level of independent mastery was difficult to gauge from the curriculum statements.

The link to employability attributes in literacy practice was detected in all subjects, except for Applied Engineering Technology and Professional Engineering Practice. The mastery of communication as an aspect of literacy is key in all the statements, though in the subject Life Orientation, there is an additional element of planning personal development in terms of the acquisition of employability (work-related) skillsets. Although the link to employability attributes such as communication, working with technology and critical and creative thinking is made clear in the introduction sections of all the respective subject guidelines (refer section C in South Africa, 2007b, 2007d, 2007f, 2013b, 2014b, and section D in South Africa, 2014d), the learning outcome statements reflect very little of this.

In all the subjects, no instances were recorded in terms of the requirements for mediation or supervision of literacy development. This is of concern as it implies a lack of distinct focus on mastering literacy capabilities without much guidance so as to exhibit independent and confident literate behaviour. An explanation could be that these advanced levels of literacy development have been ignored or omitted in the curriculum statements or alternatively that these opportunities exist but are not clearly articulated in the curriculum statements.

Mastery of functional literacy practices with a clear link to workplace contexts, standards and requirements is essential to establish literate identity. This identity is the basis from which one starts to critically and creatively engage with literacy practices for purposes of personal, work and societal transformation. Section 3.4.4 reflects the findings regarding critical and creative literacy behaviour, which is the next evolving layer of workplace literacy development.

### 3.4.4 Instances for critical and creative literacy behaviour

The methodology to determine the instances for this developmental aspect (i.e. critical and creative literate behaviour) was to track key words (mainly verbs) and phrases that relate to the questions posed (refer the elements of this aspect in section 3.2). These would be words and phrases such as “critical”, “creative”, “perform literacy (task/practice)<sup>23</sup> expertly”, “perform literacy (task/practice) independently” or any instance in which diminished mediation is implied, and “(literacy practice) is adapted”.

#### 3.4.4.1 Findings

For the fundamental subject **English First Additional Language**, only instances to demonstrate critical literacy practice were recorded (20 statements). These relate to students confidently expressing and justifying, orally and in writing, ideas, views and emotions in order to become independent and analytical thinkers (South Africa, 2014b:5). This implies that students use language and literacy critically to interact with a wide range of texts and express their own views on or respond to the perspectives, values and power relations embedded in the texts. For example, they listen and respond critically in diverse contexts for a variety of purposes; formulate relevant critical questions for diverse purposes; provide constructive feedback to other speakers (which relates to critique of spoken texts); answer questions critically and accurately; consider other points of view in order to reach a conclusion; justify their own opinions with reference to multi-modal reading texts; and reflect critically on the literacy practices in media communication. In total, 20 instances were detected (refer Annexure B), which constitutes 15% of the total recorded findings (refer Table 3.6).

The reproduction of texts in the reading module (two statements) could be recorded as adapting or transforming or even creative literacy practice, but it is not quite clear from the formulation of the statements if this is the case. It appears they relate more to mere reproduction of existing text types and styles.

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<sup>23</sup> Instead might be reference to actual practice such as reading, writing, compiling, configuring or programming machines, drawing sketches etc.

In the fundamental subject **Mathematics**, aspects of critical (four statements) and creative (one statement) literacy and numeracy practices were detected (refer Annexure B). Aspects of numeracy relating to statistics, data and geometry are meant to be developed in problem-solving contexts inclusive of engagement with local, national and global issues. Creative numeracy practice is involved in the formulation and discussion of new questions that arise from the modelling of data. No instances were recorded for the transformation of literacy practices and independent literate behaviour. The five instances found constitutes 5% of the total recorded findings (refer Table 3.6).

Creative engagement with complex social forms such as Facebook and YouTube and an online helpline was recorded (three statements) in the fundamental subject **Life Orientation**. There are also eight instances to develop critical literacy practice in that students differentiate between good and bad interviewee behaviour, read and interpret case studies and problem scenarios to develop logical reasoning and argument skills, analyse own exam writing skills and study techniques (relating to critique of own literacy practice), and critically analyse the role of the IEC in elections. No instances were recorded for the transformation of literacy practices and independent literate behaviour. In total, 11 instances were recorded (refer Annexure B), which constitutes 8% of the total recorded findings (refer Table 3.6).

In the introduction to the core subject **Applied Engineering Technology**, it is indicated that the subject allows for “achievement of design gain through the evaluation and monitoring of component manufacture by modern technological equipment in the workplace and so allowing new methodology to be developed” (South Africa, 2007b:2). However, whether this would also constitute a new literacy practice could not be determined in the content analysis of the learning and assessment activities and tasks. Only instances for creative literacy practice (two statements) were detected. Students are meant to develop this kind of literacy practice in applying new design concepts and creating a new prototype. No instances were recorded for the other sub-categories. In total, two instances were recorded (refer Annexure B), which constitutes 3% of the total recorded findings (refer Table 3.6).

In the introduction to the core subject **Engineering Processes**, it is indicated that the subject allows for “achievement of design gain through the evaluation and monitoring of component manufacture by modern technological equipment in the workplace and so allowing new methodology to be developed” (South Africa, 2007d:2). However, whether this would also constitute a new literacy practice could not be determined in the content analysis of the learning and assessment activities and tasks. No instances were recorded for this subject in this layer.

The instances that were recorded in this category for the core subject **Professional Engineering Practice** relate to developing critical literacy behaviour (three statements). Students identify problems resulting from

engineering and recommend solutions in an environmentally-based project. No instances were recorded for the other sub-categories. In total, three instances were recorded (refer Annexure B), constituting 6% of the total recorded findings (refer Table 3.6).

#### 3.4.4.2 Discussion of analysis – critical and creative literacy behaviour

Table 3.6 below summarises the recorded findings for this developmental aspect and its elements, i.e. critical literacy behaviour, creativity in engagement with complex social and cultural forms, transforming and adapting literacy practices for the workplace, and independence in terms of literate behaviour (implying no or very little mediation required).

**Table 3.6: Summary of findings for critical and creative literacy behaviour**

Independence	EFAL	Math	LO	AET	EP	PEP
Critical literacy	20	4	8	0	0	3
Creativity	0	1	3	2	0	0
Transformation of practice	0	0	0	0	0	0
Independent behaviour	0	0	0	0	0	0
<b>Total</b>	<b>20</b>	<b>5</b>	<b>11</b>	<b>2</b>	<b>0</b>	<b>3</b>
<b>%<sup>24</sup></b>	<b>15%</b>	<b>5%</b>	<b>8%</b>	<b>3%</b>	<b>0%</b>	<b>6%</b>
	<b>AVG % Fundamental</b>	<b>9%</b>		<b>AVG % Core</b>	<b>3%</b>	

In the final developmental layer, the lowest number of instances was recorded overall. The highest number of instances (20 statements) and the highest percentage of instances overall recorded were detected in the fundamental subject English First Additional Language (16%). The average percentage of recorded instances in this layer for the fundamental subjects is higher (at 9%) than the average for the fundamental subjects (3%). The higher number of recorded instances (36 in the fundamental subjects vs five in the core subjects) and the greater weighting (attached to the higher average percentage of recorded instances) imply that, in this layer, there is greater emphasis in the fundamental subjects on developing critical and creative literacy behaviour.

Only for critical and creative literacy practices only two elements affordances were found. Critical literacy (and numeracy as a complementary aspect) reside at the level of critical engagement with texts, expression of own

<sup>24</sup> Calculated as: (number of instances for this developmental aspect/total number of instances recorded for the subject) \* 100

judgement and opinion, problem-solving and critique of literacy practices or work behaviour (refer analysis in Annexure B). Development of creative literacy practice relates to creativity in engagement with complex digital forms such as Facebook, YouTube and online applications, modelling of data and design of new prototypes (refer analysis in Annexure B).

The lowest number of instances was recorded for developing this aspect (41 statements), with no real evidence of transformation of literacy practices for transition to the workplace and development of independent literate behaviour requiring little or no mediation. Given these analyses, it appears that very little opportunity is provided to engage in literacy practices independently, critically and creatively, as well as to adapt and use literacy for own purpose and benefit so as to achieve a state of grace in Scribner's (1984) terms – i.e. when literacy is regarded as transcending power that allows individuals freedom of expression and mind.

### **3.5 Analysis of learning outcome statements**

A next step in the analysis was to analyse and compare the different verbs that are used in the learning outcome statements (refer section 3.1 and Annexure C). In each instance, the literacy practice was identified with the use of a particular verb and frequency of its use was recorded. The underlying premise is that in the facilitation of learning and acquisition of competence these literacy practices will be applied. It was tested whether certain verbs have a stronger link to literacy practices and whether their frequency rate differs between core and fundamental subjects.

#### **3.5.1 Summary findings of verbs used in learning outcome statements**

Annexure C reflects the verbs used in the learning outcome statements, the frequency of their use as well as the literacy practices denoted. It is also indicated in the analysis whether there is a clear link to literacy practices or whether these practices are implied or assumed.

The verbs that appeared more than 10 times in the learning outcome statements (refer Annexure C) in the fundamental subjects are listed in Table 3.7.

**Table 3.7: Verbs frequently used in fundamental subjects**

Verb in Learning Outcome Statements	Frequency of Use	Learning or Literacy Practice Denoted
1. Use/ Use & solve & justify/ Use & determine or prove/ Use & calculate/ Use & predict	<b>16 times in Math</b>	Use multi-modal texts to perform mathematical process and operations, e.g. solve problems – functional literacy/numeracy level.
2. Identify/ List/ Suggest/ Indicate/ Identify & use	<b>18 times in LO</b>	Demonstrate understanding and knowledge of concepts (e.g. causes of stress) and processes (e.g. dealing with depression). Literacy practice is incorporated into assessment tasks or activities – academic literacy.
3. Use/ Use & perform Word functions/ Use & perform spreadsheet functions/ Create & perform database functions	<b>23 times in LO</b>	Use software applications to create digital texts and perform certain functions – functional literacy level.
4. Explain/ Explain & set/ Explain & post/ Describe/ Define/ Explain & identify	<b>43 times in LO</b>	Explain and describe to demonstrate understanding and knowledge of concepts (e.g. exam writing techniques) and processes (e.g. grievance and complaints procedures in a workplace and voting process). Literacy practice is incorporated into assessment tasks or activities – academic literacy.

The verbs that appeared more than 10 times in the learning outcome statements (refer Annexure C) in the core subjects are listed in Table 3.8.

**Table 3.8: Verbs frequently used in core subjects**

Verb in Learning Outcome Statements	Frequency of Use	Learning or Literacy Practice Denoted
1. Examine/ Check/ Inspect & diagnose/ Examine & measure	<b>22 times in EP</b>	Read and interpret multi-modal texts (e.g. digital readings, manual, diagram) in order to produce a work-related activity or text in turn – functional literacy level.
2. Explain/ Describe/ Describe and explain/ Identify and describe	<b>20 times in AET</b>	Explain design concepts through application of literacy practices such as demonstration, written texts or sketches and drawings – academic literacy.

The verbs used with high frequency (more than 10 times) in the learning outcome statements in the fundamental subjects denote functional literacy practice. Statements with verbs such as “identify”, “list”, “suggest”, “indicate”, “explain”, “describe” and “define” strongly link to academic learning and literacy practices. The verbs used with high frequency (more than 10 times) in the learning outcome statements in the core subjects also denote functional literacy practice. Statements with verbs such as “identify”, “explain”, “describe” and “define” strongly link to academic learning and literacy practices.

Therefore, the high frequency of the use of verbs such as “identify”, “explain”, “describe”, “define”, “indicate” and “suggest”, which are strongly indicative of academic learning and literacy practices, signifies that academic literacy development is a key focus in both the fundamental and core subjects. Since the curriculum is intended to be delivered in a formal institution for education and training, such literacy practices are the expectation. The challenge would be to develop capability to transform these practices for application in a workplace. In the analysis in section 3.4, it was found that the curriculum statements do not clearly specify such transformation and literacy development. In Chapter 4, this aspect forms part of the implications of the conceptual framework for workplace literacy development.

Furthermore, when verbs such as “ensure”, “fit”, “lubricate”, “place”, “pre-clean”, “clean”, “clear”, “provide”, “return”, “save”, “scrutinise and memorise”, “store”, “tighten”, “perform”, “start and run”, “carry out”, “machine”, and “cut” in the core subjects, as well as “analyse” in the fundamental subject Life Orientation, appear in outcome statements, then the link to literacy practices is not clear or vague. These verbs mostly denote a practical learning or work task, especially in the core subjects. Their frequency of use is also higher in the core subjects (refer analysis in Annexure C).

In the analysis of the verbs in learning outcome statements, the verbs used with high frequency in both the fundamental and core subjects mostly denote academic learning and literacy practices. A possible explanation was provided in this regard. Verbs used where the link to literacy practice is unclear or vague mostly appear in outcome statements in the core subjects. However, the majority of learning outcome verbs used in both the fundamental and core subjects denote a workplace literacy practice to be developed (refer the instances recorded in Annexures B and C).

### 3.5.2 Comparison of denoted literacy practice in learning outcome statements

Annexure C and Table 3.9 reflect a comparative analysis of verbs that were commonly used in both the fundamental and core subjects with a clear link to workplace literacy practices. In each instance, the frequency of use and the literacy practice its use denotes were recorded. The underpinning assumption is that these literacy practices will be applied in the learning and assessment activities and as such develop work place

literacy. The three sets of verbs with the highest frequency of use in both the fundamental and core subjects were included in the comparison.

The verbs (with their combinations and alternatives) in the fundamental subjects for which frequency of use is highest, are “explain”, “identify” and “use”. These verbs (i.e. “explain” and “identify” with their alternatives) are also used with high frequency in the core subject outcomes, and “examine” (with its combinations) is added. The literacy practices that these verbs (i.e. “explain”, “identify” and “use”) commonly denote in the fundamental subjects are reading, writing and presenting literacy practices. In the core subjects, these verbs denote more workplace-contextualised learning literacy practices.

There are 13 instances where the same verbs are used in the learning outcomes of the fundamental and core subjects (refer Annexure C). They mostly correlate in terms of the learning task that is expected, but also in terms of the application of literacy practices and development of workplace literacy. Further, it appears that literacy development and tasks are far more work-specific and workplace-contextualised in the core subjects. The analysis done in section 3.4 also supports this finding. The reason for this could lie in that the fundamental subjects may, by nature of their content and purpose as generic basis for learning, rather develop functional academic literacy (inclusive of numeracy) in general (refer to similar comments made in sections 3.3.1 and 3.4.2).

**Table 3.9: Comparison of verbs with strong link to workplace literacy practices**

Fundamental Subjects			Core Subjects		
Verb (Fundamental)	Frequency	Literacy Meaning	Verb (Core)	Frequency	Literacy Meaning
Identify/ List/ Suggest/ Indicate/ Identify & use	21	Denotes use of functional literacy practices (speaking, writing and presenting) to demonstrate knowledge and understanding.	Identify/ Identify & report/ Interpret/ Consider	20	Denotes use of functional literacy practices (speaking, writing and presenting) to demonstrate knowledge and understanding in 15 instances. Denotes identification and naming function in which the literacy practice is implied in five instances.
Use & improve/ Use/ Apply/ Identify & apply/ Use & solve & justify/ Use & determine or prove/ Use & calculate/ Use & predict/ Use & understand/ Use & perform Word functions/ Use & perform spreadsheet functions	42	Denotes use of multi-modal texts to produce such texts in turn, to perform literacy tasks or to demonstrate understanding. Functional literacy (and numeracy) capabilities are developed.	Examine/ Check/ Inspect & diagnose/ Examine & measure	25	Instances relate to implied literacy practice to perform engineering-related tasks to report on non-conformity in design. Task is more work-specific and literacy is workplace-contextualised.
Explain & distinguish/ Discuss/ Explain & set/ Explain & post/ Describe/ Define/ Explain & identify	46	Denotes use of functional literacy practices (speaking, writing, representations) to demonstrate knowledge and understanding.	Explain/ Define/ Discuss/ Describe/ Describe & explain/ Identify & describe/ Exercise thinking	37	Denotes use of functional literacy practices (speaking, writing, representations) to demonstrate knowledge and understanding.

This comparison reflects that there is very little difference between the fundamental and core subjects with regard to the verbs used with high frequency and the literacy practices they denote. It further appears that the literacy practices are more workplace-contextualised in the core subjects. The preceding analyses in sections 3.4 and 3.5.1 also support this. However, it cannot be concluded that, within the fundamental subjects, workplace literacy practices will not develop as conceptualised (refer conceptual frameworks in sections 2.4 and 2.6) if workplace contextualisation is lacking. However, workplace literacy is a situated and social practice (refer views in sections 2.2.2.1 and 2.4.2); therefore, developing literacy in workplace contexts is a key consideration and implication for this conceptualisation of literacy.

In the next section, I summarise the findings of the analyses done in terms of the conceptual frameworks (refer sections 2.4 and 2.6) in order to conclude whether there are affordances to develop workplace literacy within TVET college context as tested in one example of the curriculum for a vocational programme s. If so, the next step is to conceptualise what the implications are for developing workplace literacy readiness – these are considered in Chapter 4.

### 3.6 Summary of findings and concluding remarks

Tables 3.3 to 3.6 summarise the recorded findings of instances to develop literacy at college within the four layers as conceptualised (refer conceptual framework in section 2.6). These evolving layers are concept recognition, integration and application of functional literacy practices, mastery of capabilities and manifestation of literate identity, and finally, exhibiting critical and creative literate behaviour (refer section 3.2). Elements of each developmental aspect were formulated as questions which then directed the content analysis of the subject and assessment guidelines of three fundamental and three core vocational subjects of the programme Engineering and Related Design – a programme of the NCV qualification.

The first analysis was done in terms of the resource provision, aims and focuses of the subjects. The bulk of the analysis was directed at the affordances provided for workplace literacy development in the subject and learning outcomes and assessment standards. The final analysis was a comparison of the verbs used in learning outcome statements, the frequency of their use and the literacy practices they denote. Throughout all of the analyses, comparisons were drawn between the fundamental and core subjects.

The first analysis (refer section 3.3) revealed a distinctive link in the aims and focal points of the subjects as well as the critical and developmental outcomes (i.e. mainly communication and the use of technology) to literacy development. Affordances expressed in the subjects' focuses and aims to develop literacy practices (e.g. functional and applied literacy practices such as reading and producing multi-modal texts and academic literacy practices such as writing tests and doing projects) were later detected in the analysis of the subject and learning outcomes and assessment standards in all the subjects (refer analysis in section 3.4). The integration of

technology in work and literacy practice and other key employability capabilities such as communication, teamwork, critical thinking and problem-solving are ingrained in the critical and developmental outcomes of the subjects. However, in the analysis in section 3.4.3 (manifestation of employability capabilities as attributes of a literate identity), very few instances (13 statements) were found in the learning outcomes and assessment standards. Most of these statements (11) were found in the fundamental subjects.

The analysis of the resourcing of the subjects indicates that the envisaged (or intended) resourcing should support literacy development and create literacy-enabling environments, especially when these aim to simulate the real workplace context and practice. However, since these outcomes and resource requirements form part of the intended curriculum, there is no guarantee that this will be the practice in reality.

The main analysis was directed at detecting affordances for literacy development in the subject and learning outcomes and assessment standards in all the subjects (refer analysis in section 3.4). For the concept recognition layer, instances were recorded in terms of the elements of workplace literacy (refer section 3.4.1). These workplace literacy elements comprise (i) awareness of literacy purpose and value, both at college and in a workplace; (ii) cognition and re-cognition of context (i.e. college and work) while engaging in literacy practices; (iii) awareness of the design and features of multi-modal texts; and (iv) cognition of integrating communication and other technology while engaging in literacy practices.

Instances were recorded in all the subjects for recognising the value and purpose of literacy. No affordances to develop literacy practices in context were recorded in two subjects, namely, Applied Engineering Technology and Professional Engineering Practice. A high number of instances for concept recognition of textual features and design was recorded in all the subjects. Cognition of the use of technology in literacy practice was recorded in three subjects, namely, Life Orientation, Engineering Processes and Professional Engineering Practice. Given the total number of recorded instances for literacy concept recognition (75 in the fundamental subjects vs 49 in the core subjects), it appears that more affordances are created for literacy concept recognition in the fundamental subjects than in the core subjects. On the other hand, it is to be interpreted that the slightly higher percentage of instances recorded in the core subjects for literacy concept recognition indicates that literacy concept recognition carries more weight in the core subjects.

To trace the development of the integration and functional use of literacy, instances were recorded in terms of the elements of workplace literacy in this layer (refer section 3.4.2). These workplace literacy elements comprise (i) application of literacy practices in and across different contexts; (ii) using and integrating multi-modal texts (written, mathematical, visual, aural or spoken, gestural, digital code etc.); (iii) producing multi-modal texts in turn; and (iv) integrating technology effectively in literacy practices for communication and other functional purposes.

The most instances (388 statements) were recorded in terms of affordances for this layer. The literacy practices that are applied and used to develop functional literacy mainly relate to academic learning practices, as can be expected in a formal learning environment such as a college. From the recorded findings (refer Annexure B and section 3.4.2.2), it can be deduced that, whenever such academic literacy practice is contextualised for workplace purpose, a more favourable environment for developing workplace literacy is created. An extensive range of multi-modal texts are to be used and produced in all the subjects, although there is a greater focus on work-related texts such as graphs, drawings, component manuals, flow diagrams and digital readings in the vocational core subjects. There were no instances recorded for integration of technology for the subjects Mathematics and Applied Engineering Technology, but ample opportunity is provided for this element of workplace literacy in Life Orientation and Engineering Processes.

It can therefore be concluded that there are adequate affordances to develop workplace literacy at functional level. However, the teaching and learning environment and the contextualisation of literacy practices should support mastery of capabilities and transfer of practices to the workplace. As a result of the generic nature of content and capabilities in English and Mathematics, it is possible that that proficiency in language and mathematical processes could become the focus instead of literacy and numeracy development. Furthermore, the higher number of recorded instances (245 in the fundamental subjects vs 143 in the core subjects) and the greater weighting (attached to the higher average percentage of recorded instances) in the fundamental subjects imply that there is greater emphasis on functional literacy development in the fundamental subjects.

To trace the development of mastery of literacy capabilities and manifestation of literate identity, instances were recorded in terms of the elements of workplace literacy in this layer (refer section 3.4.3). These workplace literacy elements comprise (i) mastered literacy capabilities manifesting as literate identity; (ii) employability and work attributes being demonstrated in literacy practices; (iii) sensitivity in literacy practice in relation to work process flow and standard for performance; and (iv) diminished mediation required when engaging in literacy practices.

The only recorded instances in terms of affordances for expressing a literate identity were in the subjects English and Mathematics. These relate to expressions of appreciation, justification or opinion by students (refer Annexure B and section 3.4.3.2). Instances with regard to employability attributes (communication mainly) were recorded in all subjects, except for two core subjects. The highest number of instances in this layer was recorded in terms of sensitivity in literacy practices to workplace requirements or standards. These instances were recorded in all three core subjects and English – in the latter, instances relate more to correct language use in terms of grammar, style and conventions. The analysis further revealed that no affordances are provided for developing literacy practices to a level where students capably apply these with diminished supervision.

The average percentage of recorded instances in this layer for the core subjects is substantially higher (at 22%) than the average for the fundamental subjects (8%). The higher number of recorded instances (80 in the core subjects vs 32 in the fundamental subjects) and the greater weighting (attached to the higher average percentage of recorded instances) imply that, in this development, there is greater emphasis on establishing a workplace-literate identity in the core subjects. This could be the case because of the workplace contextualisation (refer findings in section 3.4.3.1).

To trace the development of critical and creative literacy behaviour, instances were recorded in terms of the elements of workplace literacy in this layer (refer section 3.4.4). These workplace literacy elements comprise (i) applying objective or critical literacy practices (at college and in the workplace); (ii) creative engagement with complex social and cultural forms; (iii) literacy practices being transformed or adapted for transition to the workplace; and (iv) independent literate behaviour as no or minimal mediation or guidance is required.

There were instances recorded in the fundamental subjects and Professional Engineering Practice (41 statements) that relate to engagement in critical and creative literacy practices (refer section 3.4.4.1). These opportunities relate to expression and justification of own opinion and presentation of argument, and also entail engagement in critical reading and viewing practices and formulating critical responses. Creative engagement with complex social forms such as webpages, blogs and YouTube is afforded in Life Orientation (refer Annexure B and section 3.4.4.2). The analysis further revealed that no affordances are provided to develop literacy capabilities to such a mastery level that students are able to transform or adapt literacy practices and will require no supervision or mediation in terms of literacy behaviour. It can therefore be concluded that, although instances were recorded, there are not ample affordances to develop literacy so as to manifest as critical and creative practice that transforms the individual and 'society' (in this sense, the workplace).

For the last evolving layer, the lowest number of overall instances were recorded. The highest number of instances and the highest percentage of overall recorded instances were detected in the fundamental subject English First Additional Language (16%). The average percentage of recorded instances in this layer for the fundamental subjects is higher (at 9%) than the average for the fundamental subjects (3%). The higher number of recorded instances (36 in the fundamental subjects vs five in the core subjects) and the greater weighting (attached to the higher average percentage of recorded instances) imply that, in this development, there is greater emphasis on sedimenting critical and creative literate behaviour in the fundamental subjects.

Given the recorded findings, it can be concluded that literacy development in all the subjects lie mainly at the levels of concept recognition and integration of functional literacy practices – the latter are mostly academic (written-linguistic mostly) in nature (refer analyses done in sections 3.4.1 and 3.4.2). Further, the contextualisation of literacy development in the fundamental subjects relates more to general academic and social contexts. This could be the case because the purpose of these subjects is to develop capabilities regarded

as fundamental to learning and technical skills development – the latter is the focal point in the core subjects. As concluded before, the contexts for literacy development in the vocational core subjects are far more workplace-specified in terms of expected practice and performance (refer sections 3.3.2 and 3.4.3). This raises the question whether the required literacy capabilities are indeed developed in that which is regarded as fundamental to learning so as to facilitate manifestation of these capabilities at mastery and independence levels.

The final step of the analysis was to determine whether there is a difference in the fundamental and core subjects in relation to the kinds of verbs used in the outcome statements, the frequency of use and the literacy practices denoted (refer section 3.5). Again, no substantial differences were detected and many of the same verbs relating to academic literacy and learning practices were used in both the fundamental and core subjects (refer analyses in section 3.5). In a sense, this is to be expected in a curriculum meant for implementation in a formal teaching and learning environment.

In terms of the analyses, I concede that there might have been an element of subjectivity in the interpretation of outcomes or what they denote in terms of literacy and learning practices, especially when these are not clearly formulated. For example, some outcomes in Engineering Processes relate more to the description of work processes than to expressing what knowledge, skill, value or attitude is to be learned, for example “pre-clean using cleaning solvents that are non-reactive to components or start and run machine.” Furthermore, because of the review of the three fundamental subjects, the outcomes and assessment standards in these second-generation documents seem to be better formulated. For example, the assessment tasks, especially in Life Orientation, are more practical and descriptive – for example “students develop a PDP, using the computer, indicating goals for lifelong learning and how job market related skills could be strengthened. Students complete an online skills audit.” Assessments tasks in the core subjects are mostly vaguely or broadly stated as written test, practical demonstration or project, group discussion, and drawings or illustrations.

In this chapter, the results of the content analysis revealed that there are affordances in the current curriculum implemented at a TVET college to develop workplace literacy as conceptualised (refer conceptualisation in section 2.6). In the final chapter, I discuss how this conceptualisation plays out in an evaluation for workplace literacy readiness and the implications thereof with regard to the employability of TVET college graduates.

## CHAPTER 4: IMPLICATIONS FOR DEVELOPING WORKPLACE LITERACY READINESS

- 4.1 Introduction and research questions
- 4.2 Contribution of the study
- 4.3 Limitations and future research
- 4.4 Conceptualisation of workplace literacy in a TVET college context
  - 4.4.1 Brief overview of the conceptual frameworks for workplace literacy and development thereof
  - 4.4.2 Implications of the conceptual frameworks for TVET colleges
    - 4.4.2.1 Implications for the classroom and practitioner
    - 4.4.2.2 Implications for the management of a TVET college
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- 4.5 Implications for developing workplace literacy readiness
  - 4.5.1 Workplace literacy and work readiness
  - 4.5.2 Evaluation of affordances for developing workplace literacy readiness
- 4.6 On a final note

### 4.1 Introduction and research questions

Literacy, particularly workplace literacy, is a highly contested domain. These contestations, different views, perspectives and ideologies were highlighted in sections 2.1 to 2.3. Within these ideological perspectives and frameworks of what literacy means for the individual and in society, I aim to conceptualise workplace literacy and the development thereof (refer conceptual frameworks in 2.4 and 2.6), specifically in the context of TVET colleges. The conceptualisation further intends to provide some direction in relation to the questions raised about the employability of college graduates (refer problem statement in section 1.3.1). As such, the research questions were:

- (i) How can workplace literacy be conceptualised in a TVET college context?
- (ii) How would this conceptualisation shed light on possible workplace literacy development within a TVET college curriculum?
- (iv) Based on this conceptualisation, what are the implications for developing workplace literacy readiness?

I elaborate on the possible use or usefulness of the conceptual framework for workplace literacy development (refer framework in section 2.6) in section 4.4, and further translate this conceptualisation into a rudimentary analytical tool to evaluate any curriculum in terms of affordances to develop workplace literacy readiness.

## 4.2 Contribution of the research

This research contributes to a deepening body of knowledge on workplace literacy in very specific terms within a TVET college context that conceptualises workplace literacy to mean more than knowing how to work or being employable through being literate. Postulated in an ideological perspective, the conceptualisation moves away from regarding literacy as skills modules or subject content to be taught and assessed, although there is a developmental aspect. In this ideological perspective, the value and purpose of literacy for the individual and in society, as well as the capabilities required for engagement in literacy practices in diverse contexts, but more specifically the modern-day workplace, are circumscribed and given substance. Workplace literacy is conceptualised as social and situated practices in which not only the written-linguistic modes play a role, but other modes of meaning-making as well, for example drawing graphs and technical sketches (visual mode), using body language and gestures for effect when presenting (gestural mode), and listening critically in a telephone conversation (audio mode). Furthermore, I regard workplace literacy as broader than mere language or linguistic literacy, similar to the perspectives on literacy by the OECD and UNESCO, and to include complementary dimensions such as numeracy and information processing in technology-rich environments – the latter referring to those competences that relate to engagement with digital and communication technology and texts.

In terms of the conceptual frameworks (refer frameworks in sections 2.4 and 2.6), workplace literacy development is depicted in terms of four developmental or evolving layers (refer framework in section 2.6). However, contrary to conventional views of literacy, this research presents a view of workplace literacy as evolving (as a state of being) to become broader and inclusive of more critical capabilities when one engages in literacy practices. Furthermore, the underpinning premise of workplace literacy development is that engagement in ample, diverse and situated literacy practices, together with an appropriate level of mediation and guidance, should develop literate identity (i.e. capable and independent literate behaviour). It is when the individual performs work or learning tasks critically, creatively and with confidence that literacy becomes a state of being (identity) and literate behaviour is evident. This view and conceptualisation has significant implications for workplace literacy development at TVET colleges and was framed in such a way that it could be used as an analytical tool to determine the extent to which any curriculum creates affordances for workplace literacy readiness to develop (refer section 4.4.2.4).

Furthermore, as seen in the conceptualisations (refer sections 2.4 and 2.6) and in global frameworks on employability (refer section 1.2.3.3), functional workplace literacy capabilities (especially with regard to communication, critical reading and effective writing practices) are sought after and regarded as essential employability attributes. This research, in terms of this view of employability, also contributes to understanding enhancement of employability through workplace literacy development. It reinforces the view that workplace

literacy is critical to develop those employability skills said to be crucial for the jobs of the future (refer 2016 World Economic Forum report – The Future of Jobs). On the basis of the content analysis, I attempted a simplified evaluation instrument by which it is possible to determine affordances for such workplace literacy development. This instrument forms part of the section on implications for TVET colleges (section 4.4.2.4). Although not intended as part of the key focus of the research, as practitioner I thought it would be useful as a departure point for further research.

On a concluding note, TVET colleges are at the forefront of government strategy and national policy, especially with regard to artisan development (refer the NDP, NSDS III, the White Paper and PSET plan), and are key to achieving the objectives and outcomes articulated in these said plans and strategies. Although I do not address the array of complex challenges (refer overview of TVET college history and challenges in section 1.2) that the TVET college system faces, the research is meant to add value in respect of employability of its graduates. It proposes a solution to bring TVET colleges closer to their intended purpose and objective in the PSET system – i.e. to provide intermediate and higher-level skills - and to be a viable alternative in terms of technical and vocational articulation routes.

The number of implications for classroom practice, college management and curriculum review, elaborated on in section 4.4, as well as the evaluation instrument proposed for workplace literacy readiness in section 4.4.2.4, are meant to propose changes in terms of policy, teaching and learning practice and curriculum development for TVET colleges. Some of the proposed implications have already been integrated in a turnaround strategy for TVET colleges, presenting an ideal opportunity to contribute to the discourse and strategy on TVET colleges. To quote Albert Einstein, “if you want different results, do not do the same things.” With this research, I am proposing exactly that in terms of workplace literacy development.

### **4.3 Limitations and future research**

In general, the limitations of the research present further opportunities for research. One such limitation resides in that the conceptualisation, regardless of being widely and thoroughly researched, has not yet been implemented to determine its effect and as such remains a conceptual perspective. A next level of research would be to test TVET college graduates’ work readiness in terms of the proposed conceptualisation and to do a tracer study on graduates who are employed to determine whether these kind of workplace literacy attributes indeed enhance employability.

Furthermore, although the implications of the conceptual framework for policy, practice, theory and future research (refer section 4.4) have been spelled out, implementation of new practices and transferring workplace literacy competences to the workplace cannot be guaranteed as they reside at the level of the policymaker,

TVET college and individual student. The conditions that enable and strengthen transfer of literacy capabilities are not covered in this research and might be the next step.

Although a strong argument is presented in the research linking workplace literacy to employability, a limitation in this regard is conceded and I do not attempt any critical discourse on youth employment and unemployment, nor do I propose solutions to this effect. I merely argue that, should workplace literacy be developed as conceptualised in this research, employability of graduates cannot but be enhanced. Whether graduates actually find employment or not is the domain of other studies.

Other limitations of the research lie in the content analysis of the curriculum documents as methodology to test the validity of the conceptualisation for workplace literacy development. I already acknowledged in section 3.6 that, in the analysis of the curriculum statements, there is an element of subjectivity as one engages with written text and interprets it at one's own level of critical literacy. At times, especially in the core subjects where statements are vaguely or broadly phrased, I decided on a certain interpretation. Moreover, only the curriculum documents were analysed for affordances, presenting a narrow view on the real potential that may be evident when the curriculum is enacted. Furthermore, valid contributions on how a narrow focus of workplace literacy influences curriculum focus and access to literacy practices were not explored and are a next step of research.

In addition, the curricula that were reviewed (i.e. those of the three fundamental subjects) had been subjected to not only a critical review of content but also to language editing so as to improve clarity and understanding of the intended aims and outcomes. Statements are therefore sometimes better phrased, making it easier to detect affordances for literacy development or links to workplace literacy practices (refer comments and examples in section 3.6).

Another limitation is that the subject and assessment guidelines that were analysed represent only the intended curriculum. The affordances for workplace literacy development may be there, but how they would play out in the enactment of the curriculum might be quite different. Furthermore, although quite a number of implications are spelled out in section 4.4, inclusive of those for policy and curriculum, I did not critically analyse the design of the qualification and the curriculum of the NCV programme Engineering and Related Design, which was chosen for the content analysis.

Finally, this research does not address a range of socio-economic factors influencing the context of TVET college students, nor does it describe how access is conditioned by prior family, schooling and other experiences. The strong influence of language proficiency on literacy development has also not been explored, but these would areas for future publications.

It is within this conceptualisation of workplace literacy development (with limitations conceded) that I do propose some solution to and enhancement of employability of TVET college graduates. I discuss these implications in the next section.

#### **4.4 Conceptualisation of workplace literacy in a TVET college context**

In this section, the implications of the conceptual frameworks on workplace literacy are discussed in terms of what workplace literacy means in a TVET college context, and implications for the classroom and practitioner, college management, and policy and curriculum review.

##### **4.4.1 Brief overview of the conceptual frameworks for workplace literacy and development thereof**

The first research question relates to conceptualising workplace literacy in a TVET college context. Based on an extensive content analysis of literacy on perspectives and assessment of literacy (refer Chapter 2), two conceptual frameworks were derived (refer frameworks in sections 2.4. and 2.6). These perspectives on literacy range from an autonomous model of literacy, depicting literacy as mainly cognitive competence in terms of reading and writing (refer section 2.2.1), towards more ideological stances on literacy, depicting literacy as sociocultural and situated practices which have the potential to empower and transform the individual and society where these practices play a role (refer section 2.2.2).

Moreover, the global statistics and reports on literacy by organisations such as the OECD and UNESCO were considered in said conceptualisation of workplace literacy and yielded some insight in terms of how literacy is globally regarded and measured (refer section 2.1.2). As such, these measurements influence societal views on literacy, despite criticism that measuring literacy in this manner is too mechanical and disregards the socio-situated practices of literacy as well as the literacy capabilities that people possess outside of formal education and training (refer ideological view of literacy in section 2.2.2.1). However, additional perspectives in this regard have been added, especially those relating to literacy development in formal education and training – “secondary Discourses” in Gee’s (1990) sense.

It is within these views that literacy has become regarded as not mere language/ linguistic capabilities (measured as prose and document literacy), but also including complementary dimensions such as numeracy (measured as quantitative literacy) and problem-solving in technology-rich environments (refer section 2.1.2). The latter has brought a focus on literacy practices in the use of digital technology and communication tools and networks (refer Smith et al., 2000; Warschauer, 2006; Zuboff, 1988). Within these knowledge-driven and information-rich workplaces and societies, literacy capabilities to acquire and evaluate information, communicate with others, perform practical tasks and solve problems for personal, work and civic purposes have become the standard for functional literacy practice (refer Creswell & Miller, 2000:126; Goad, 2002).

Given the ideological and socio-situated perspectives on workplace literacy as expounded in sections 2.1 to 2.3, workplace literacy is thus conceptualised as socially construed and situated practices comprising the functional use of multi-modal literacy capabilities that eventually manifest as a workplace-literate identity. It is within this literate identity that one is capable of independent literate behaviour and engages in literacy practices critically and creatively. These practices are further refined and sharpened for the workplace when applied in multiple literacy events that relate to the vocation or workplace into which these students envisage transitioning.

In terms of the conceptualisation, the purpose of workplace literacy is recognised as functional and value-adding when literacy practices are applied in a variety of learning and work functions and for different purposes, such as to read and process information in multi-modal texts, to communicate information using social platforms such as YouTube and blogs, or to calculate tax in a spreadsheet. By critically applying such functional literacy practices, multi-modal literacy capabilities manifest and find expression in workplace-literate behaviour, thereby establishing a workplace-literate identity. This identity, as transformative and creative power, enables the individual to further use literacy critically and creatively, for example to critique the contexts in which literacy is used or to develop new practices (refer conceptual framework in section 2.4 and analysis in section 3.6).

The development of literacy at a TVET college as conceptualised (refer framework in section 2.6) is based on the ICWLA by Langer and Knefelkamp (2001). This developmental model (refer explanation in sections 2.4.1 and 2.6.1) assesses assimilation of literacy in six distinct sectors of workplace literacy, each in relation to five developmental stages of workplace-culture and labour-market literacy. In my conceptualisation, these evolving layers of literacy development are neither sequential nor watertight, although there are developmental aspects. Rather, an initial awareness of literacy evolves into independent and functional literate behaviour, but this does not necessarily happen sequentially and in one event or engagement in a literacy practice all the layers of development may be present.

In terms of this conceptualised development of literacy (refer conceptual framework in 2.6), students at the TVET college recognise (i.e. 'cognise' and 're-cognise') the value and purpose of being literate in the contexts where literacy practices are applied, especially learning and workplace practices. For that purpose, concepts of multi-modal textual features and design need to be re-cognised and developed. In addition, the value and purposes of technology in literacy practices are conceded and cognised. All of these cognised and re-cognised literacy concepts translate into the functional application of literacy practices in which diverse multi-modal texts are used and produced, while integrating technology meaningfully into literacy practice. For example, students read and interpret graphs on a webpage to solve problems or record readings on a work machine in order to configure a work process.

The functional application of literacy practices further develop and refine these multi-modal literacy capabilities which eventually manifest as literate behaviour and identity. Dependence on mediation of literacy gradually

diminishes, although it does not disappear completely. Students, while critically and creatively engaging in literacy practices, should develop capabilities to translate academic literacy practices into workplace literacy practices, thereby becoming ready for transition to the workplace. As such, literacy holds transformative and creative power for the individual and his/her work readiness (refer conceptual framework in section 2.6 and analysis in section 3.6).

In the next section, I elaborate on the implications of these conceptualisations in the context of TVET colleges and preparing graduates for the workplace.

#### **4.4.2 Implications of the conceptual frameworks for TVET colleges**

The implications of the conceptual frameworks for workplace literacy development have been derived from the findings of the content analysis conducted in Chapter 3. Further, Edwards (2011:38–39) identifies certain factors (i.e. contextual, organisational, curriculum, micro-political and individual factors) that impact upon what happens when a curriculum is enacted, that is, when teaching and learning occur. Similarly, these factors are considered in workplace literacy development and spelled out in terms of implications at classroom and practitioner level, management level at a TVET college, and policy and curriculum review level.

##### **4.4.2.1 Implications for the classroom and practitioner**

Students become literate as they learn – in this case, literacy development happens in a situated context such as a TVET college. What then are the implications for workplace literacy development as such a situated and social practice? As highlighted and supported by global bodies such as UNESCO (refer the 2006 EFA Monitoring Report), mediators of literacy development (in this case, lecturing staff) should aim to create literacy-rich environments in which students develop literacy and other capabilities in terms of what to do (technical knowledge), how to do it (practical knowledge) and why it is done this way (values and attitudes). Such an approach emphasises and supports the socially constructed and collective nature of learning and literacy – the latter being developed not only in education institutions, but in social life and work as well. This is the practice turn.

This brings to the forefront the necessity of making the environment where literacy is developed supportive of workplace literacy practices and culturally sensitive. It is within these kinds of learning environments – that is, diverse and multiple literacy events – that literacy practices are to be contextualised, taking into account their own culturally-determined value and requirements. As alluded to in sections 2.5 and 4.4.1, multiple and diverse literacy events should allow for practical engagement in literacy practices that are relevant to the context of work and that of the students. To develop literacy within this conceptual frame, students cannot only engage with linguistic texts and writing practices, but have to develop other crucial multi-modal literacy capabilities as well,

for example effective and appropriate oral communication, correctly interpreting (reading) and responding to visual communication and texts as well as reading and creating digital texts.

Furthermore, in a view of literacy as critical and transformative power (refer conceptual layer in section 2.4.5), the diverse cultural perspectives and 'deficiencies' that students bring to literacy events and practices are to be meaningfully embraced by any mediator of literacy (refer Freire & Macedo, 1987, 1995; Rogers & Street, 2011). Literacy practices and events must therefore relate to the context of work and that of the student, for the purpose of developing capabilities that transcend mere conformation to rules and conventions. For example, a critical writing practice could be contextualised in a more modern-day literacy event such as writing a blog (a practice that students may already be familiar with) rather than the often-used report or essay. Within this event, students are made aware that certain technical requirements apply when writing a blog (refer concept recognition layer), but the choice of language and style may differ whether it be in personal or work-related capacity (refer definition of functional literacy). Literate identity and behaviour in this case reside not only in the mastery of writing blogs, but also in applying other literacy capabilities such as expressing views, formulating an argument on a contentious issue and demonstrating technical competence in posting the blog on the Internet. Developing literacy to such critical behaviour and not merely at functional level could, in my view, result in transformation of the literacy practice and the individual engaging in it.

For this conceptualisation of literacy as socio-situated practice (refer section 2.4.2) to have effect, mediation of literacy cannot be restricted to lecturers of fundamental subjects such as English Language, Mathematics or Communication as commonly perceived. Indeed, every education and training practitioner at a college can potentially develop literacy practices, as is supported by the content analysis findings in section 3.4. Ample affordances for literacy development were found in the curriculum statements of the core vocational subjects (refer sections 3.4.1–3.4.4) to integrate and apply literacy practices, such as the compilation of technical reports, doing demonstrations, working with digital and other technical designs, and reading and interpreting technical specifications.

This potential for literacy development being within the ambit of every lecturer or practitioner therefore has implications for the profile of practitioners at TVET colleges. It implies that a practitioner at technical and vocational core level should equally be aware of the role and purpose of workplace literacy practices and have mastered such literacy practices him-/herself to be able to facilitate and develop these within technical and other learning contexts. These crucial literacy capabilities are currently neither acknowledged nor prioritised in the proposed TVET college lecturer qualifications and development strategies. Such a focus on developing literacy (as conceptualised) not only within TVET college graduates (students), but also at practitioner level, is another practice turn.

Furthermore, as shown in the content analysis findings in sections 3.4.1 to 3.4.4, but specifically in the sensitivity to workplace standards and requirements in the core subjects (refer analysis in section 3.4.3), literacy practices and events relating to the workplace cannot but be infused into learning environments. As is to be expected in an educational and training institution with a focus on teaching and learning, academic literacy practices such as reading texts (linguistic, number or mathematical, digital, visual etc.), writing reports and examinations and tests to demonstrate knowledge and cognition, as well as doing projects, are the norm. Despite their dominance in teaching and learning practices, the potential to develop the connection with the workplace and facilitate induction into workplace literacy practices resides in the existing curriculum. Practices such as using workplace documents (e.g. cash flow statements or technical reports) in the literacy event, simulating the workplace (e.g. a business centre or restaurant) at college or doing practical training on equipment similar to that used in the workplace are within the scope of the curriculum and reach of the practitioner.

Although any transfer of literacy competences and practices to the workplace is conceded not be automatic (refer limitations in section 4.3), a peripheral participation in work in Lave and Wenger's (1991) sense is probable with work-related contextualisation of literacy practices. This has further implications relating to the pedagogy used in teaching and learning at TVET colleges and the institutional culture. I further elaborate on such enabling environments for workplace literacy development in the next sections.

#### **4.4.2.2 Implications for the management of a TVET college**

McGrath et al. (2010a:48-51) highlight the role of educational institutions (and specifically TVET colleges) in making graduates employable. The broad focus of institutions should not be about passing on the hard skills outlined in the curriculum, or indeed the softer interpersonal skills, but rather on facilitating networks and passing on social capital. This includes modelling the world-of-work in the way the institution is set up and managed spatially and temporally, the networks of relationships that are developed by the students and alumni, and the direct contact with employers that is facilitated by formal work-based experiences and informal connections between teaching staff and employers. Further, graduates are to be prepared for work through peripheral participation in work – either by means of simulation and practical application at college level or in workplaces through workplace-based learning.

In a similar manner, literacy is conceptualised as being developed within formal teaching and learning contexts, as well as at institutional level. The latter is the domain that college management controls and oversees. As stated (refer section 4.4.2.1), it would be beneficial to link literacy practices to the world the students live and engage in. As such, ample and diverse resources are required to create the kind of literacy-rich environments where the free flow of information and thinking is enabled. This means for example making available different types of workplace texts, ICT or equipment; establishing and equipping practice rooms, workshops and computer centres; and providing free access to the Internet on campus. Since college management is responsible for

budget management and control of what happens at a college, such literacy-rich environments should be a non-compromised focus.

Moreover, literacy is developed within student life and outside of the classroom by mediators other than subject lecturing staff. A literacy-rich student life should be encouraged and a culture of becoming literate should be pursued. For example, the student representative council could be guided in terms of proper and professional minute-keeping, marketing students could assist with marketing and promoting the college, student interns could be used for administrative work such as data capturing during peak registration periods, and student support services could be provided in terms of compiling market-related and relevant CVs to prepare graduates for the world of work. The subject Life Orientation, with its projects to be run at the college and in the community (refer analysis in 3.4.2), is a good example of how literacy practices can be taken out of the classroom and into college and community life.

It is my view, given the strong recommendations by global bodies such as UNESCO and the OECD (refer section 2.1), that the creation of literacy-rich environments is the responsibility of all. A college management that has, and actively encourages and develops, a literate identity in its graduates and staff, is one step closer to graduates emerging from the college exhibiting confident and independent workplace-literate behaviour. This kind of workplace-literate identity has implications for the transition to the workplace (refer implications for employability in section 4.5).

#### 4.4.2.3 Implications for policy and curriculum review

The greatest implications of this conceptual framework on workplace literacy for TVET college graduates reside at policy level. As seen in the content analysis (refer analysis and discussion in sections 3.4.2 and 3.6), much of the literacy engagement in learning and assessment centre around academic literacy practices such as written-linguistic practices. In terms of my analysis, developing literacy capabilities to a mastery level cannot be achieved if practices are not inculcated in work contexts and do not involve multi-modal capabilities that are critically applied.

The conventional teacher-centred and lecturing-dominated approach often used will not benefit such critical literacy development. More activity-based and learner-centred pedagogical approaches such as project and phenomenon based learning and assessment are advocated. Project based learning<sup>25</sup> (PBL) is a student-centred pedagogy that involves a dynamic classroom approach in which it is believed that students acquire a

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<sup>25</sup> Refer Bauer, I. 2006. Project-based learning. na.; Blumenfeld, P.C., Soloway, E., Marx, R.W., Krajcik, J.S., Guzdial, M. & Palincsar, A. 1991. Motivating project-based learning: Sustaining the doing, supporting the learning. *Educational Psychologist*, 26(3-4):369-398; Krajcik, J.S. & Blumenfeld, P.C. 2006. Project-based learning (pp. 317-34). na.

deeper knowledge through active exploration of real-world challenges and problems. It is a style of active learning and inquiry-based learning that presents established facts or portrays a smooth path to knowledge by investigating and responding to a complex questions, challenges, or problems. posing questions, problems or scenarios. Phenomenon based learning<sup>26</sup> (PhBL or PhenoBL) is a multidisciplinary, constructivist form of learning or pedagogy where students study a topic or concept in a holistic approach instead of in a subject-based approach. It includes both topical learning, where the phenomenon studied is a specific topic, event or fact, and thematic learning, where the phenomenon studied is a concept or idea.

In a recent social dialogue on the curriculum development in TVET colleges, the vocational systems and pedagogy in Germany and Finland were presented as efficient VET systems to develop artisans in particular. Holistic in design, these teaching and training approaches aim to develop a range of competences, ranging from the specialised technical skills required in a specific occupation and workplace to an array of social and individual competences such as literacy capabilities. The inculcation of attributes such as creativity, critical thinking, innovation, flexibility and adaptability constitutes a standard part of these pedagogical approaches, while personal and professional autonomy and a broader sense of responsible citizenship are also propagated (Kotzé, 2017:12). In a similar manner, the pedagogical approach for formal literacy development is conceptualised as a socio-situated practice that takes into account the literacy capabilities and constraints students bring to the literacy event, while being sensitive to the culturally determined requirements and conventions influencing literacy practices. These kinds of situated learning and learner-centred approaches where the student voice is not silenced promote critical mastering of workplace-literate identity and behaviour.

Different approaches to teaching, learning and assessment practices in TVET colleges have also been proposed by McGrath (2012) and by organisations such as UNESCO and the Commonwealth of Learning (Latchem, 2017). These approaches and perspectives include open, blended, flexible and mobile learning, online learning courses and digital repositories, augmented and virtual realities as well as simulations, games, role plays and 3D printing (Latchem, 2017:30–33). All of these approaches incorporate highly technical and multi-modal literacy practices. Should these kinds of teaching and learning practices become the norm, this research has consequence with its conceptualisation of developing literacy practices that strongly relate to how work is performed - in and through communication and information technologies and in meaning-making modes other than linguistic-written practices.

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<sup>26</sup> Refer Francis, C., Breland, T.A., Østergaard, E., Lieblein, G. & Morse, S. 2013. Phenomenon-based learning in agroecology: A prerequisite for transdisciplinary and responsible action. *Agroecology and Sustainable Food Systems*, 37(1):60-75; Louca, L.T. & Zacharia, Z.C. 2012. Modelling-based learning in science education: Cognitive, metacognitive, social, material and epistemological contributions. *Educational Review*, 64(4):471-492.

As already touched on in sections 4.4.2.1 and 4.4.2.2, learning contexts should pave the way to workplace contexts. Therefore, work-integrated learning, workplace-based learning and simulation at colleges are key in technical and vocational education and training. Similarly, workplace literacy development in this conceptualisation should be contextualised and constructed in workplace contexts (refer description in section 2.4.2). Workplace literacy development without this workplace learning component will result in developing mere technical proficiency with language, mathematics and the use of computer software applications. As such manifestation of a workplace-literate identity and critical literacy behaviour would be inhibited (refer conclusion in section 3.6). As found in the content analysis (refer findings in section 3.4.3), literacy practices that have been situated in workplace contexts, for example reading technical designs and specifications to set up a machine for a work process, have a greater probability of being transferred to a workplace practice. Thus, workplace literacy in policy and curriculum must be instantiated in workplace literacy practices and learning for the practice turn.

Although a critical analysis of college programme and qualification design is not the intent of this research (refer limitation in section 4.3), current qualification and curriculum design and their implementation do not fully support the development of workplace literacy as conceptualised. The NCV curriculum (refer sections 1.6.4.1 and 3.1) includes fundamental learning, which to some extent supports functional literacy and numeracy development (refer analysis in section 3.4.2). However, the Report 191 curriculum, except in the form of Communication as a subject, has no such fundamental learning. The NCV qualification further has a compulsory practical component, but this component is restricted to the core vocational subjects, with the result that fundamental learning is assessed purely theoretically. The Report 191 programmes have no such compulsory practical component. As argued in the preceding paragraphs, the development of workplace literacy practices that critically link literacy and training practices at college to the workplace require affordances for workplace-based learning – either real or simulated.

Moreover, a modular approach in curriculum design for workplace literacy is proposed, especially in a TVET college context. A plumber requires a different set of workplace literacy capabilities than a person preparing to work in an accounting environment or administrative office. There are generic and cross-cutting capabilities, but the engagement with certain texts and the cognitive demand in certain literacy tasks could differ. A modular approach allows for flexibility in terms of including relevant workplace literacy capabilities for specific vocations. For example, report writing is regarded as a critical workplace capability, but an automotive mechanic may only require to know how to write a brief technical report, while someone in the human resources field should be able to compile a comprehensive narrative report on a labour case. In my view, contextualising literacy practices as work practices can only be achieved in such a modular curriculum design.

A modular design would also to some extent address the misalignment between the literacy capabilities focused on in the subject content of the fundamental subjects (i.e. language literacy, numeracy and mathematics, life skills and computer literacy) and those that are required in a workplace. As argued in sections 3.3, 3.6 and

4.3.2.1, the fundamental subjects have, by nature of the subject content, a distinct advantage to develop workplace literacy behaviour. Although some instances for workplace contextualisation were detected (refer analysis in sections 3.3 and 3.4.1), the risk remains that the transformation of college literacy practices into workplace literacy practices will not happen. The vocational core subjects have far more affordances in this regard (refer analysis in section 3.4.3). The broader question, raised by Gee et al. (1996) as well, remains whether the types of literacy taught in educational institutions are relevant (or meaningful) to the present and future lives of learners. This conceptualisation makes clear that literacy only becomes a work identity and behaviour if the learning is situated in a work practice, and allows for active and collaborative student participation. To have a view and approach that workplace literacy is mainly developed in the fundamental subjects with exclusion of other core vocational subjects, is to propagate disjointedness.

In conclusion, the limited affordances detected in one NCV programme curriculum (Engineering and Related Design) to develop a workplace-literate identity and independent workplace-literate behaviour (refer content analysis findings and discussion in sections 3.4.3 and 3.4.4) do not bode well for mastery of workplace literacy capacities at critical and transformative level. Without developing such critical workplace literacy, the power and transformation inherent in literacy are denied, while employability challenges for TVET college graduates remain.

## **4.5 Implications for developing workplace literacy readiness**

### **4.5.1 Workplace literacy and work readiness**

The second research question relates to the manner in which the conceptual framework shed light on possible workplace literacy development within a TVET college curriculum. Youth unemployment is a global phenomenon and concern, more so for the cohort of youth termed the 'NEET' (refer section 1.3.1). As such, post-school institutions are obliged to ensure the relevance of educational and training programmes to promote graduates' employability. The conceptualisation of workplace literacy is proposed as some measure to enhance the employability TVET college graduates.

The premise for developing workplace literacy capabilities as a measure to enhance employability of graduates has been argued in terms of the perspectives and conceptualisations on employability (refer section 1.2.2.3). A comparative research of employability in the college sectors of England and South Africa revealed that there is a key set of knowledges, capabilities and attitudes that promote individual employability and that students have internalised. Strikingly, however, students appear to have little sense of this social capital dimension of their employability (McGrath et al., 2010a:49). Five lenses were used in the comparison, one of which was employability attributes. The employability attributes in the research include literacy competences and capabilities, among others. These literacy capabilities (as the focus of this research) include basic transferable competences, such as prose and document literacy, writing, numeracy and verbal presentation, as well as key

transferable competences. The latter are inclusive of literacy capabilities to engage in practices such as reasoning, problem-solving, work process management, teamwork and intercultural relations, personal task and time management, basic ICT competence, interpersonal communication, and customer service (McQuaid & Lindsay, 2005:209–210). Moreover, as concluded in section 1.2.3.3, there is a common thread in all employability perspectives and frameworks in terms of the personal attributes and technical and professional competences associated with employability. They most commonly include the capabilities used in the comparative research and as such establish a distinctive link between developing workplace literacy and enhancement of employability.

Furthermore, in terms of the definitions of workplace literacy offered in section 2.3.2, workplace literacy relates to all work processes in which language and literacy as well as numeracy (or quantitative literacy) and technology play a role. Hull et al. (1996:198) also remind that workplace literacy is socially construed and connected to the power dynamics in the workplace. Literacy manifests not only in ordinary tasks such as sending an email or reading a report, but also in high-prestige functions such as exercising judgement and problem-solving. Literacy behaviour is expected in highly technological and diverse work environments where sophisticated and multi-modal forms of literacy practice and communication are used. Texts are no longer only printed and require new capabilities for critical engagement and productive work. Literacy is therefore key to function and work in multicultural teams, thereby requiring a workplace-literate identity as well as self-regulation and monitoring of literate behaviour.

Given the conceptualisations of what is key to be developed in terms of employability attributes and what workplace literacy constitutes, it has been proposed that developing such literacy in college graduates should enhance employability. An analytical tool has been created to evaluate the curriculum in terms of affordances provided to develop the workplace literacy readiness of students and graduates. This instrument is discussed in the next section.

#### **4.5.2 Evaluation of affordances for developing workplace literacy readiness**

The content analysis in Chapter 3 showed that the highest number of instances were recorded in terms of affordances for the functional application of academic literacy practices (as could be expected in a formal learning environment such as at a college). However, from the recorded findings (refer Annexure B and section 3.4.2.2), it can be deduced that, whenever such academic literacy practices are contextualised for a workplace purpose, a more favourable environment is created for developing functional and critical workplace literacy practices.

Moreover, the limitation in the curriculum affordances appears to reside at the levels of developing a workplace-literate identity and critical and independent literate behaviour (refer conclusion in section 3.6). There were

limited instances recorded in this regard - these mainly relating to expressions of appreciation, justification or opinion by students and involving critical reading and viewing practices; development of communication competences; exhibiting sensitivity in literacy practices to workplace requirements or standards; and creative engagement in social platforms such as webpages, blogs and YouTube. The analysis further revealed that no affordances are provided to develop literacy capabilities to such mastery level that students are able to transform or adapt literacy practices and will require no supervision or mediation in terms of literate behaviour (refer Annexure B and section 3.4.4.2). It can therefore be concluded that, although instances were recorded, there are not ample affordances to develop literacy so as to manifest as critical and creative practice that transforms the individual and 'society' (in this sense, the workplace). Therefore, any content evaluation of affordances for work readiness has to signal development of these critical and creative workplace- literate capabilities.

The workplace literacy readiness evaluation is similarly conceptualised in terms of the same content analysis questions as expounded in section 3.2. These questions in turn are based on the elements of workplace literacy practice as conceptualised in sections 2.4 and 2.6. The main developmental aspects therefore correspond with those in the conceptual framework on workplace literacy development, namely:

- (i) concept recognition of the value, purpose and context of workplace literacy, design and features of multi-modal texts, as well as integration of technology into literacy practice;
- (ii) functional application of literacy practices while using and producing multi-modal texts and integrating technology into literacy practice;
- (iii) manifestation of a workplace-literate identity and employability attributes while demonstrating sensitivity to workplace standards and a diminished need for supervision; and
- (iv) critical and creative workplace literacy behaviour that leads to transformation of literacy practices and independent behaviour.

The evaluation instrument is presented as an analytical tool with technical descriptions that indicate the affordances required in terms of workplace literacy development. The indicators are either workplace literacy practices and activities for development of workplace literacy. However, it should be noted that the technical descriptions do not propose curriculum content detail, but are mere descriptive indicators. Furthermore, it should be noted that this is a first step and further refinement and development are required.

**Table 4.1: Evaluation grid for affordances to develop workplace literacy readiness**

Layers of Literacy Development	Value and Purpose of Literacy	Situated Practice (Context)	Engagement with Multi-modal Texts	Integration of Technology in Literacy Practices
Concept Recognition Layer	<p><b>Affordances for:</b></p> <p>Students to recognise what being literate means and comprises in terms of practices for the workplace.</p>	<p><b>Affordances for:</b></p> <p>Students to recognise the workplace contexts in which these literacy practices are used and applied.</p>	<p><b>Affordances for:</b></p> <p>Students to conceptualise and recognise the features and designs of multi-modal texts. These are linguistic or numeric, visual, audio and auditory, gestural, and spatial in design.</p>	<p><b>Affordances for:</b></p> <p>Students to develop a concept of the purpose and use of technology in literacy practices, such as calibrating machines for cutting machine parts or posting a self-produced YouTube video.</p>
	<p><b>Literacy practices and activities:</b></p> <p>Students identify and engage in literacy practices that can be transferred to a workplace as such, for example reading, speaking, writing and listening practices, performing calculation and mathematical operations, communication, and computation.</p>	<p><b>Literacy practices and activities:</b></p> <p>In literacy events, students are able to link literacy practices to workplace contexts, e.g. compiling documents such as a feedback report for a specific work purpose, reading and using statistical data for marketing purposes, performing calculations so as to erect a structure, and drawing and interpreting technical sketches in order to configure a tool cutting machine.</p>	<p><b>Literacy practices and activities:</b></p> <p>In literacy events, students recognise the styles and conventions that apply when using these multi-modal texts, for example when formal or informal tone and style are appropriate, which formatting conventions apply when drafting different workplace documents, or what non-verbal cues mean in a particular conversation. Students further demonstrate cognition of and distinguish between different text types such as written reports, verbal (oral) texts and graphical representations.</p>	<p><b>Literacy practices and activities:</b></p> <p>In literacy events, students recognise and recognise literacy practice when using technology, e.g. using a software application such as Word to craft documents, searching the Internet for information, performing calculations and applying formulae within an Excel spreadsheet, or capturing information in database records so as to produce data reports or graphs.</p>

Layers of Literacy Development	Value and Purpose of Literacy	Situated Practice (Context)	Engagement with Multi-modal Texts	Integration of Technology in Literacy Practices
<b>Functional Application of Literacy Practices</b>	<p><b>Affordances for:</b> Students to use and apply literacy practices effectively so as to become functionally literate (refer definition in section 1.5.4), i.e. applying literacy practices to write, read, view, speak, listen, calculate or use mathematical operations, communicate, and compute.</p>	<p><b>Affordances for:</b> Students to select and apply literacy practices appropriately and functionally in different workplace-related contexts.</p>	<p><b>Affordances for:</b> Students to use and produce workplace texts while taking into account the multi-modal design and features of these texts.</p>	<p><b>Affordances for:</b> Students to successfully integrate literacy practices when using technology and to functionally use technology in literacy practices.</p>
	<p><b>Literacy practices and activities:</b> In literacy events and tasks, students apply multi-modal literacy practices effectively and appropriately for different work and study purposes and functions such as communicating information or ideas in multiple modes, compiling and formatting documents, reading analytically, performing calculations and mathematical operations to solve problems, and effectively integrating technology into literacy practices.</p>	<p><b>Literacy practices and activities:</b> In literacy events and tasks, students apply work-related literacy practices and demonstrate proficiency, for example drafting emails for work purposes, doing a budget for a work project, drawing technical plans and designs, doing an Internet search for information relating to a work problem, expressing a view or proposing a solution during a meeting.</p>	<p><b>Literacy practices and activities:</b> In literacy events and tasks, students functionally and appropriately use and produce multi-modal texts in multiple communication practices and meaning-making modes. For example, they write a memo based on case study; they draft a table with statistical data and interpret it to solve a problem; they accurately read and interpret visual communication such as signs or illustrations; they communicate and present ideas in a formal presentation; they effectively use gestures and body language in communication with others; or they make use of space in structural designs or even on a webpage for functional purposes.</p>	<p><b>Literacy practices and activities:</b> In literacy events and tasks, students functionally and appropriately use technology in literacy practices, while at the same time functionally applying literacy practices when engaging with technology. For example, they read and interpret on-screen prompts on a webpage or interactive digital document; they use a social network platform to communicate important messages or for advertising; they search the Internet effectively for information and research purposes; or they draft, format and edit documents on the computer<sup>27</sup>.</p>

Layers of Literacy Development	Value and Purpose of Literacy	Situated Practice (Context)	Engagement with Multi-modal Texts	Integration of Technology in Literacy Practices
Mastery and Capability (establishing a workplace-literate identity)	<p><b>Affordances for:</b></p> <p>Students to use and apply multi-modal literacy practices, cognisant of the social norms and values attached to workplace literacy practices as well as the power inherent in a literate identity in the workplace.</p>	<p><b>Affordances for:</b></p> <p>Students to conceptualise work in terms of its written (and other modal) representations and demonstrate employability attributes.</p>	<p><b>Affordances for:</b></p> <p>Students to understand how, when, why and by whom text is created and used in the workplace. They use and produce multi-modal texts that strongly link and relate to work literacy practices.</p>	<p><b>Affordances for:</b></p> <p>Students to use technology to adapt or improve literacy practices, and apply literacy practices efficiently in the use of technology.</p>
	<p><b>Literacy practices and activities:</b></p> <p>In this sense, a literate identity emerges and manifests in the literacy event when students demonstrate appropriate multi-modal literacy capabilities for the workplace without much guidance or supervision. For example, they efficiently apply persuasive techniques in selling practices while adhering to the requirements and conventions for this literacy practice, or demonstrate appropriate customer communication in different customer service contexts.</p>	<p><b>Literacy practices and activities:</b></p> <p>In this sense, a literate identity emerges and manifests when students demonstrate sensitivity to workplace norms when using and producing texts in workplace-related literacy events. For example, they adhere to compilation and formatting conventions and requirements when drafting documents, they adhere to workplace etiquette and protocol in behaviour and relations, or they can work with others in project teams.</p>	<p><b>Literacy practices and activities:</b></p> <p>In this sense, a literate identity emerges and manifests when students demonstrate capabilities in using and producing multiple workplace-related texts. They are also able to convert and adapt multi-modal literacy practices engaged with at college to workplace practices. For example, they are able to craft a checklist for doing a safety check, they can design advertisements to be placed on the web, or they can formulate and present an argument in a labour negotiation context.</p>	<p><b>Literacy practices and activities:</b></p> <p>In this sense, a literate identity emerges and manifests when students demonstrate literacy capabilities, requiring little or no supervision, while using technology such as the computer or computerised machines. For example, they do a structural design using computer software (computer-aided drawing), they do financial reconciliation using an appropriate software application or place an advertisement on a social platform such as Facebook instead of in the printed media.</p>

<sup>27</sup> It is in this regard that I propose document literacy to be assessed in an integrated manner together with computer literacy and not in a theoretical examination paper.

Layers of Literacy Development	Value and Purpose of Literacy	Situated Practice (Context)	Engagement with Multi-modal Texts	Integration of Technology in Literacy Practices
Critical and Creative Literacy Behaviour	<p><b>Affordances for:</b> Students to use and apply literacy practices critically and creatively for various purposes. They critique the contexts in which these practices play a role as well as the practices themselves, thereby monitoring and self-regulating own literate behaviour.</p>	<p><b>Affordances for:</b> Students to critically and creatively transform literacy practices for the workplace.</p>	<p><b>Affordances for:</b> Students to use and produce multi-modal texts critically and creatively in literacy practices.</p>	<p><b>Affordances for:</b> Students to use technology critically in workplace literacy practices as well as integrate literacy practices critically and creatively in the use of technology.</p>
	<p><b>Literacy practices and activities:</b> In the literacy event, students express opinions and critical views, and use literacy practices to analyse, critique and solve problems. They require very little or no supervision or mediation for critical engagement in literacy practices. There is also critical awareness demonstrated of their own and others' literacy behaviour; for example, they provide critical feedback on literacy practices such as presentations or demonstrations, project reports and others.</p>	<p><b>Literacy practices and activities:</b> In the literacy event, students adapt conventional workplace literacy practices to new technological environments that impact on how work is done. For example, instead of doing a traditional printed media campaign, they start messaging campaigns using social media such as Twitter or Facebook, or use new technology to do work, e.g. using tools or machines to draw designs and perform calculations for a construction project.</p>	<p><b>Literacy practices and activities:</b> New types of texts are created and used, e.g. webpages, YouTube videos and online CVs, with very little or no supervision or mediation. There is also critical and objective engagement with multi-modal texts, and these texts are used analytically to express views and critique on workplace and societal matters of concern, for gaining information, to make decisions as well as to develop further literacy capabilities as technology advances. For example, they are able to analyse and discern valid versus invalid opinions and identify and draw on multiple and multicultural perspectives to formulate arguments.</p>	<p><b>Literacy practices and activities:</b> Students use existing literacy practices to create new practices when technology dictates such, for example doing computer-aided design, drawing and machining of parts, doing research using the Internet, or using new communication technology to raise awareness and for advocacy. They also critically integrate literacy practices in the use of technology. For example, they are able to express views and opinions critically and appropriately in the social media or apply literacy practices critically in the use of new technology, such as robots in manufacturing.</p>

The same premises underpin this assessment framework as for the conceptualisation of workplace literacy (refer section 2.4.1). These are:

- (i) Workplace literacy and learning are situated social practices (refer section 2.2.2.1).
- (ii) Workplace literacy practices are developed through application within multiple contexts and modes of communication and meaning-making that relate to the vocation or workplace these students envisage transitioning into (refer section 2.2.2.2).
- (iii) Workplace literacy is used in a variety of functions and for different purposes (refer sections 2.2.2.1 and 2.2.2.2).
- (iv) Workplace literacy manifests in capabilities that find expression in a workplace-literate identity and behaviour.
- (v) Critical workplace literacy practices hold transformative and creative power (refer description in 2.2.2.3).
- (vi) Workplace literacy is assimilated in developmental layers, ranging from concept recognition to independent mastery and literate identity and behaviour (refer Langer, 2003:322–324; Langer & Knefelkamp, 2001). However, literacy does not develop sequentially in these layers, but rather evolves to a next.

Moreover, certain assumptions underpin the technical description grid. The main purpose of workplace literacy development is to develop multiple capabilities in terms of literacy practices so as to understand and use information from different multi-modal texts for work purposes, e.g. writing editorials, news stories, and factual reports; using checklists for a work process; participating in and leading briefing sessions; reading and interpreting the body language of the person with whom one is engaged in conversation; or drawing conclusions about the spatial information on a plan. It is also to develop document literacy – the ability to locate and use information in various documents such as job applications, payroll forms, transportation schedules, frameworks, tables and graphs and producing such documents in turn, for example completing an order form, designing a webpage, or crafting a presentation.

Although it is assumed that academic and workplace literacy practices will mainly develop in formal learning contexts, workplace literacy is also developed in non-curricular student life and activities, for example serving on the student representative body.

Workplace literacy development is not limited to language and mathematical proficiency. Development of numeracy (as defined in section 1.5.4) and integration of technology in literacy practices (as defined in section 1.5.5) as complementary to linguistic literacy practices are essential parts of workplace literacy development. Furthermore, development of workplace literacy should not be restricted to teaching and learning that occur in

fundamental subjects such as English and Mathematics or Mathematical Literacy. In the content analysis (refer conclusion in section 3.6), it was found that there is ample affordance literacy is as strongly developed in vocational core subjects. Therefore, workplace literacy development becomes the responsibility of all kinds of literacy mediators (these can be formal, e.g. lecturers, or informal, e.g. other students) and occurs in all domains of student and college life (refer implications in sections 4.4.2.1 to 4.4.2.3).

Workplace literacy development is envisaged to occur at the college. However, there is no guarantee that these capabilities will be successfully transferred to the workplace – that depends on the individual. However, in terms of this conceptualisation, should there be affordance for literacy to develop as critical literacy behaviour which is ingrained in a workplace-literate identity, transferability is greatly enabled. Moreover, the more literacy is contextualised in a workplace literacy practice, the stronger the likelihood that it will be transferred and transformed for the workplace.

These conceptualised workplace literacy capabilities have a distinctive link with employability attributes (refer frameworks in section 1.2.3.3) and their development should enhance workplace readiness, especially for those work practices mediated by literacy and in which literacy play a role.

#### **4.6 On a final note**

This was certainly the most difficult and arduous journey I have ever undertaken, but one with its own Pygmalion effect. It made me rethink the use of language and literacy as well as my own perceptions of what workplace literacy means and comprises. It furthermore took me on a journey of transforming my own literacy practices and establishing a literate identity in terms of this research.

As a practitioner in the TVET college sector, I could not continue to think along the rigid technical lines in terms of workplace literacy development as I had done before. However, changing these perceptions at policy level and other spheres of influence is going to be no mean feat. As shown in the content analysis of one curriculum programme (refer Chapter 3), workplace literacy could be developed to a fair extent in the colleges, not only as linguistic capabilities, but also inclusive of numeracy and computer literacy. But this development resides mainly at concept recognition and functional practice level. As conceptualised, workplace literacy requires to evolve to a workplace-literate identity and independent critical behaviour in order to reach a state of grace in Scribner and Cole's (1981) terms. Then literacy becomes a transcending power that allows individuals freedom of expression and mind and to act freely upon their world and work.

To develop workplace literacy as such, a powerful state of mind and being is what presents as key challenges to college systems and graduates. Moreover, at most a sound basis for workplace literacy is laid at colleges, but it remains up to the individual to uptake the practice when in the workplace and to strengthen and build on

what was developed. Ultimately, to become workplace literate and establish a literate identity is what is regarded as transforming, enhances employability so that workplace literacy becomes, in Street (2009:142) words, “a multi-modal sign by which we know the world we live in” – an identity as a working and thinking being.

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## ANNEXURE A: NCV SUBJECT MATRIX

## NATIONAL CERTIFICATE (VOCATIONAL) QUALIFICATION NQF LEVELS 2, 3 &amp; 4: MATRIX OF SUBJECTS

NB: (O) = OPTIONAL SUBJECTS\*


**higher education  
& training**

 Department:  
Higher Education and Training  
REPUBLIC OF SOUTH AFRICA

\* OPTIONAL SUBJECTS CAN ALSO BE CHOSEN FROM ANY OTHER PROGRAMMES

	Level 2 SAQA ID NO: 50440	Level 3 SAQA ID NO: 50442	Level 4 SAQA ID NO: 50441
<b>Fundamentals*</b> <i>*Note: The 3 fundamental subjects are compulsory. The 3 core vocational subjects are also compulsory. A 4<sup>th</sup> vocational subject must be taken but can also be a vocational subject from another programme.</i>	<ul style="list-style-type: none"> <li>English/Afrikaans/IsiXhosa (First Additional Language)</li> <li>Life Orientation</li> <li>Mathematics OR</li> <li>Mathematical Literacy</li> </ul>	<ul style="list-style-type: none"> <li>English/Afrikaans/IsiXhosa (First Additional Language)</li> <li>Life Orientation</li> <li>Mathematics OR</li> <li>Mathematical Literacy</li> </ul>	<ul style="list-style-type: none"> <li>English/Afrikaans/IsiXhosa (First Additional Language)</li> <li>Life Orientation</li> <li>Mathematics OR</li> <li>Mathematical Literacy</li> </ul>
<b>Engineering and Related Design</b>	<ul style="list-style-type: none"> <li>Engineering Fundamentals (06021002)</li> <li>Engineering Systems (06021022)</li> <li>Engineering Technology (06021012)</li> <li>Automotive Repair &amp; Maintenance (O)* OR</li> <li>Engineering Fabrication (O)* OR</li> <li>Fitting and Turning(O) * OR</li> <li>Physical Science (O)* OR</li> <li>Refrigeration Principles (O)* OR</li> <li>Welding (O)*</li> </ul>	<ul style="list-style-type: none"> <li>Engineering Practice and Maintenance (06021003)</li> <li>Engineering Graphics and Design (06021023)</li> <li>Materials Technology (06021013)</li> <li>Automotive Repair &amp; Maintenance (O)* OR</li> <li>Engineering Fabrication - Boilermaking (O)* OR</li> <li>Engineering Fabrication – Sheet Metal Work(O)* OR</li> <li>Fitting and Turning(O)* OR</li> <li>Physical Science (O)* OR</li> <li>Refrigeration Practice (O)* OR</li> <li>Welding (O)*</li> </ul>	<ul style="list-style-type: none"> <li>Engineering Processes (06021004)</li> <li>Applied Engineering Technology (06021024)</li> <li>Professional Engineering Practice (06021014)</li> <li>Automotive Repair &amp; Maintenance(O)* OR</li> <li>Engineering Fabrication - Boilermaking (O)* OR</li> <li>Engineering Fabrication – Sheet Metal Work(O)* OR</li> <li>Fitting and Turning(O)* OR</li> <li>Physical Science (O)* OR</li> <li>Refrigeration and Air-conditioning Processes (O)* OR</li> <li>Welding (O)*</li> </ul>

## ANNEXURE B: CONTENT ANALYSIS FINDINGS

### B1. Legend and method used for recording findings

The following legends are used to refer to the different subjects and curriculum documents to make recording of findings easier.

*Table B1: Subject acronyms*

WPL	Workplace literacy
EFAL	English First Additional Language
MATH	Mathematics
LO	Life Orientation
EP	Engineering Processes
AET	Applied Engineering Technology
PEP	Professional Engineering Practice

*Table B2: Curriculum acronyms*

AG	Assessment Guidelines
SG	Subject Guidelines
SO	Subject Outcome
LO	Learning Outcome
AS	Assessment Standard
AT	Assessment Task

The tables (B3 – B6) following reflects the recorded findings of the analysis of the subject and learning outcomes and assessment standards in the respective subject and assessment guidelines of the three fundamental and three core subjects (refer section 3.1). The reason for this selection was also explained in 3.1. Furthermore, as explained in 3.2, the four coding categories (developmental aspects in terms of the conceptual framework in 2.6) were defined and the kind of affordances expected for literacy development were formulated as questions. The questions have been labelled as the sub-categories in the tables and constitute the elements of workplace literacy in each developmental layer (refer conceptual frameworks in 2.4 and 2.6). The subject and assessment guidelines were analysed in terms of the affordances detected for each coding category and sub-category. For ease of comparison in the analysis, the fundamental and core subjects were juxtaposed in the tables.

By directing the analysis towards the expectations of favourable environments (or affordances) in the identified sections, implies conducting a discourse analysis to some extent. In some instances, a key word or phrase such as “purpose” or “apply” or “context” or “critical and creative thinking” were traced in the phrase, outcome statement or assessment standard and accepted to be indicative of the affordance for the particular category and sub-category. These key words and phrases were underlined. In other instances, the phrase, outcome statement or assessment standard was analysed and the affordance inferred. In such cases these key words and phrases indicative of the affordance for the particular category and sub-category were underlined as well, and a brief explanation for the inclusion in the analysis was added. Wherever the actual wording in the curriculum statements was used for analysis, it was cited. In some instances, a decision was taken to interpret the statements if poorly phrased or badly written. This could have led to subjective interpretation or even misinterpretation of these curriculum statements.

All the instances were counted and recorded and percentages calculated (refer Tables 3.3 – 3.6 in chapter 3). The findings were then discussed and interpreted (refer discussion and interpretation in sections 3.4 and 3.6). Some affordances, indicative of different developmental aspects, were recorded for all the categories that it relates to. Furthermore, should the affordance appear in a more than one curriculum statement, it was counted more than once.

## **B2. Recorded instances for literacy concept recognition**

The instances for the concept recognition were recorded as: (i) Awareness of value and purpose of literacy; (ii) Cognition and re-cognition of using literacy in context; (iii) Cognition and re-cognition of textual features and (iv) Cognition of technology in literacy practice (refer section 3.2).

Table B3: Recorded instances for literacy concept recognition

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
Awareness of value and purpose EFAL	<ol style="list-style-type: none"> <li>1. <u>"Listen and respond critically in diverse contexts for a variety of purposes"</u> (SO1.1);</li> <li>2. <u>"Speak accurately and correctly in diverse contexts for a variety of purposes and audiences"</u> (SO1.2);</li> <li>3. <u>"Formulate relevant critical questions for diverse purposes"</u> (SO1.2, LO4);</li> <li>4. <u>"Identify the purpose of reading and creative texts"</u> – refer ranges p.10 (SO2.1, LO3).</li> </ol>	<ol style="list-style-type: none"> <li>1. <u>"Speaking strategies are analysed and used for a wide range of purposes"</u> (SO1.2, AS1);</li> <li>2. <u>"Writing tasks are planned for specific purposes, audiences and contexts"</u> – refer range p.17 (SO3.1, AS1).</li> </ol>	Awareness of value and purpose AET	<ol style="list-style-type: none"> <li>1. <u>Demarcate the location of machines and walk ways to ensure that warning and informative signs are appropriately positioned</u> (SO7.1.4, LO1&amp;4).</li> </ol>	No instances found in AG of AET.
Awareness of value and purpose Math	<ol style="list-style-type: none"> <li>1. <u>"Use mathematics to plan and control financial instruments"</u> – refers to a specific use and purpose (SO5.1).</li> </ol>	No instances found in AG of Math.	Awareness of value and purpose EP	<ol style="list-style-type: none"> <li>1. <u>Attach information tag to component for future reference</u> -relates to purpose (SO7.1.3, LO1)</li> <li>2. <u>Ensure storage is appropriate</u> – refer range statement p.5, i.e. <u>delivery note attached</u> (SO7.1.3, LO4);</li> <li>3. <u>Inspect and diagnose carefully in disassembly</u> – refer range statement p.5, i.e. <u>tag for clarity</u> (SO7.2.1, LO4).</li> </ol>	<ol style="list-style-type: none"> <li>1. <u>Attaching information tag for identification purposes</u> (SO1.3, AS1);</li> <li>2. <u>Attaching relevant information</u> such as delivery note for <u>storing purposes</u> – refer to range statement p.11 (SO1.3, AS4);</li> <li>3. <u>Disassembled parts are tagged for clarity</u> (identification) - refer to range statement p.11 (SO2.1, AS4).</li> </ol>
Awareness of value and purpose LO	<ol style="list-style-type: none"> <li>1. <u>Explain the value of an online job application and posting CV on the Internet</u> –refer to value of written and digital texts (SO1.2, LO3);</li> <li>2. <u>"Using the Internet for various online applications and social communication purposes"</u> – refer ranges p.15 (SO 9.1, LO1-2).</li> </ol>	<ol style="list-style-type: none"> <li>1. <u>"The Internet is used for a variety of study and work-related applications"</u> – refer range p.25 for <u>purpose</u> (SO9.1, AS1);</li> <li>2. <u>Social electronic media and networks are used for various communication purposes</u> – refer range p.26 (SO9.1, AS2).</li> </ol>	Awareness of value and purpose PEP	<ol style="list-style-type: none"> <li>1. <u>"Consider the necessity for reporting in various stages of a project"</u> (SO7.3.3, LO2).</li> </ol>	<ol style="list-style-type: none"> <li>1. <u>"The need for reporting in various stages of a project is considered and explained"</u> (SO3.3, AS2).</li> </ol>
Cognition and re-cognition in context EFAL	<ol style="list-style-type: none"> <li>1. <u>"Listen and respond critically in diverse contexts for a variety of value and purposes"</u> (SO1.1);</li> <li>2. <u>"Speak accurately and correctly in diverse contexts for a variety of value and purposes and audiences"</u> (SO1.2);</li> <li>3. <u>"Engage in sustained interaction in diverse contexts"</u> – refer range p.9 (SO1.2, LO6);</li> <li>4. <u>Write and present texts for a wide range of value and purposes and audiences</u></li> </ol>	<ol style="list-style-type: none"> <li>1. <u>"Different forms of oral communication are used in diverse contexts"</u> – refer range of spoken texts p.14 (SO1.2, AS2);</li> <li>2. <u>"Oral presentations are researched, planned and delivered in diverse contexts"</u> (SO1.2, AS3);</li> <li>3. <u>"Writing tasks are planned for specific value and purposes, audiences and context"</u> – refer range p.17 (SO3.1, AS1);</li> </ol>	Cognition and re-cognition in context AET	No instances found in SG of AET.	No instances found in AG of AET.

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
	<p>appropriate to diverse contexts – refer range p.12 (SO3.1);</p> <p>5. "Correctly <u>apply a variety of language structures and grammar conventions in diverse settings</u>" – refer range p.13 (SO4.2, LO1).</p>	<p>4. "Final texts are presented using the <u>conventions and formats required by the context</u>".(SO3.1, AS5);</p> <p>5. "A range of <u>language structures and grammar conventions</u> of South African English are accurately identified and <u>applied in diverse contexts</u>" (SO4.2, AS1).</p>			
Cognition and re-cognition in context Math	<p>1. Interpret models both in <u>mathematical and real-life situations</u> (SO2.4);</p> <p>2. "Analyse and represent <u>mathematical and contextual situations</u> using integrals" (SO2.5);</p> <p>3. "<u>Identify situations or issues that can be dealt with through statistical methods</u>" (SO4.1, LO1);</p> <p>4. Record and interpret data <u>using graphical representations and numerical summaries which are consistent with the data, and clear and appropriate to the situation and target audience</u> - refer range p.12 (SO4.1, LO2);</p> <p>5. "<u>Interpret and clearly communicate results of probability experiments correctly in terms of real context</u>" (SO4.3, LO4).</p>	<p>1. "<u>Situations or issues that can be dealt with through statistical methods are identified</u>" (SO4.1, AS1).</p>	Cognition and re-cognition in context EP	<p>1. "Understand and follow verbal or written instructions <u>in accordance with workplace procedures</u>" (SO7.3.1, LO10).</p>	<p>1. <u>Parts have been identified and placed in order for assembly</u> – implies awareness of context and work process (SO1.1, AS4);</p> <p>2. <u>Verbal and written instructions are followed in line with workplace procedures</u> (SO3.1, AS10).</p>
Cognition and re-cognition in context LO	<p>1. "List <u>typical interview questions and prepare suitable answers</u>" – implies literacy practice in a certain context (SO1.3, LO4);</p> <p>2. "Explore <u>the effects of ICT in terms of a social computer environment</u>" – refers to literacy practice in a certain context, i.e. range p.12 (SO5.1, LO1-2);</p> <p>3. Explore <u>precautionary and safety measures in a legal computer environment</u> - refers to literacy practice in a certain context (SO5.2, LO1-3);</p> <p>4. "<u>Do advanced calculations within different assignments/context</u>s" – refer range p.13 (SO7.2, LO1);</p> <p>5. "Practise <u>creating and editing charts for different assignments/context</u>s" (SO7.3).</p>	No instances found in AG of LO.	Cognition and re-cognition in context PEP	No instances found in SG of PEP.	No instances found in AG of PEP.

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
Cognition and re-cognition of textual features EFAL	<ol style="list-style-type: none"> <li>1. "Formulate <u>logical and coherent sentences</u>" – relates to cognition of spoken text and language structure (SO1.2, LO3);</li> <li>2. Express appreciation and enjoyment related to <u>aspects of creative texts</u> – refer range p.8 (SO1.2, LO11);</li> <li>3. <u>Examine reading and creative texts</u> thoroughly – refer ranges of texts and features p.10 (SO2.1, LO1);</li> <li>4. "View <u>multi-media texts</u> with attention to <u>format, layout, use of colour, meaning, message and value and purpose</u>" – refer ranges of texts and features p.11 (SO2.2, LO1);</li> <li>5. Write and present texts <u>using correct language and grammar structures as well as conventions and formats</u> appropriate to diverse contexts – refer range p.12 (SO3.1);</li> <li>6. "<u>Plan for a persuasive writing task</u> (<u>brainstorming, mind-mapping, etc.</u>) and <u>organise information according to the structure and features of the required text type</u>" (SO3.1, LO1);</li> <li>7. "Investigate and explain <u>different types of media communication</u>" - refer ranges of types and features p.12 (SO4.1, LO1)</li> <li>8. Investigate and explain <u>strategies and elements used in media communication</u> – refer range p.12 (SO4.1, LO2);</li> <li>9. "Accurately identify and apply a <u>range of language structures and grammar conventions</u> of South African English in diverse contexts" – refer range p.13 (SO4.2, LO1).</li> </ol>	<ol style="list-style-type: none"> <li>1. "The <u>structure and key features of texts</u> are examined and reflected on in order to show how they shape meaning" – refer ranges p.15-16 (SO2.1, AS3);</li> <li>2. "Familiar <u>creative texts are evaluated and analysed in terms of background, stylistic devices, theme, characters</u>" – refer range p.16 (SO2.1, AS7);</li> <li>3. The <u>structure and key features of multi-modal texts</u> are examined and reflected on – refer range of features p.16 (SO2.2, AS3);</li> <li>4. "<u>Different types of media communication</u> are investigated and explained" – refer range p.18 (SO4.1, AS1);</li> <li>5. "<u>Elements used in media communication</u> are investigated and explored" – refer range p.18 (SO4.1, AS2);</li> <li>6. A range of <u>language structures and grammar conventions of South African English</u> are accurately applied – refer range p.19 (SO4.2, AS1).</li> </ol>	Cognition and re-cognition of textual features AET	<ol style="list-style-type: none"> <li>1. "<u>Design prototype of a structure with new and different technological impact</u>, considering a range of factors" – relates to cognition of features of specific designs (SO7.2.2, LO2).</li> <li>2. "Check all <u>specifications, their corrections</u> and identify them in the <u>prototype upgrade</u>" – relates to features in designs (SO7.3.2, LO4);</li> <li>3. "Include the <u>control system components and structure, material/s, and construction process</u> in the <u>design of the prototype</u>" (SO7.4.2, LO4).</li> </ol>	<ol style="list-style-type: none"> <li>1. "<u>Design of a prototype includes material/s and construction processes</u> to take account of minimal engineering practices" - relates to cognition of features in designs (SO2.2, AS1; SO3.2, AS2; SO4.2, AS4).</li> </ol>
Cognition and re-cognition of textual features Math	<ol style="list-style-type: none"> <li>1. Identify <u>characteristics</u> in respect of <u>graphs and algebraic functions</u> - refer to range p.7 (SO2.2, LO3);</li> <li>2. Record, organise and interpret data using <u>samples of correct size and representative</u> - refer to elements of data texts (SO4.1, LO1);</li> </ol>	<ol style="list-style-type: none"> <li>1. <u>Characteristics are identified</u> with respect to mathematical functions – refer range p.15 (SO2.2, AS2).</li> </ol>	Cognition and re-cognition of textual features EP	<ol style="list-style-type: none"> <li>1. "Communicate <u>understanding of verbal instructions</u>"– relates to cognition of features of verbal (oral) texts (SO7.3.1, LO2);</li> <li>2. "Read and <u>understand drawing information</u>" – relates to cognition of drawing texts (SO7.3.1, LO3).</li> </ol>	<ol style="list-style-type: none"> <li>1. "<u>Understanding of verbal instructions</u> is communicated " – relates to that verbal instructions are comprehended and followed (SO3.1, AS2);</li> <li>2. "<u>Drawing information is read and understood</u>" – relates to comprehension of drawing texts (SO3.1, AS3).</li> </ol>

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
	3. Record, organise and interpret data using <u>graphical representations and numerical summaries</u> – refer to features of data texts (SO4.1, LO2).				
Cognition and re-cognition of textual features LO	<ol style="list-style-type: none"> <li>1. "Explain the <u>meaning of common words used in exam questions</u>" – refer range p.9, relates to features of examination questions (SO2.2, LO5);</li> <li>2. "List the <u>basic items a job contract should cover</u>" – relates to features of such document (SO4.1, LO3);</li> <li>3. "Integrate and practise <u>features and functions to create and edit a Word document</u>" - refer range p.12 (SO6.1, LO1-2);</li> <li>4. "Use the <u>mail merge feature</u> in a Word document" (SO6.2)</li> <li>5. "Use <u>integrated features to format a spreadsheet</u>" (SO7.1, LO1);</li> <li>6. "<u>Display the formulas in spreadsheets</u>" – relates to certain feature in digital text (SO7.2, LO2);</li> <li>7. "Create a <u>column, line and pie chart</u>" - - relates to certain features in digital texts (SO7.3, LO1);</li> <li>8. "<u>Insert chart titles and legends</u>" - relates to certain features in digital texts (SO7.3, LO2);</li> <li>9. "<u>Edit the appearance</u> of a chart by <u>changing the fill colour and size</u>" - relates to certain features in digital texts (SO7.3, LO3);</li> <li>10. "Identify the <u>options on the Menu and Database toolbar</u>" relates to certain features in digital texts (SO8.1, LO2);</li> <li>11. "<u>Create a report</u> based on a table <u>using basic features</u>" (SO8.3, LO1-3).</li> </ol>	<ol style="list-style-type: none"> <li>1. A <u>typical job contract is described</u> - relates to features of such document (SO4.1, AS1);</li> <li>2. <u>Integrated features are used to format a Word document</u> – refer range p.21 (SO6.1, AS1);</li> <li>3. <u>Integrated features are used to format a spreadsheet document</u> - refer range p.23 (SO7.1, AS1);</li> <li>4. "The <u>difference between a table, a record and a field</u> is explained" – relates to awareness of different features in a specific type of digital text (SO8.1, AS2).</li> </ol>	Cognition and re-cognition of textual features PEP	<ol style="list-style-type: none"> <li>1. "<u>Identify the different features</u> from a given <u>sketch, drawing or graph</u>" (SO7.3.1, LO1);</li> <li>2. "<u>Identify different system representations</u> in manufacturing, engineering and technology" – relate to range, i.e. block diagrams, flow charts and/or logical networks (SO7.3.2, LO1-4);</li> <li>3. "Identify <u>different approaches to compiling a technical report</u>" (SO7.3.3, LO1).</li> </ol>	<ol style="list-style-type: none"> <li>1. "Different <u>sketch, drawing or graph features are identified and presented</u>" (SO3.1, AS1);</li> <li>2. <u>Different system representations</u> are identified, discussed and designed – relate to range, i.e. block diagrams, flow charts and/or logical networks (SO3.2, AS1);</li> <li>3. "<u>Approaches to compiling a technical report</u> are identified" (SO3.3, AS1).</li> </ol>
Cognition of technology in literacy practice EFAL	No instances found in SG of EFAL.	No instances found in AG of EFAL.	Cognition of technology in literacy practice AET	No instances found in SG of AET.	No instances found in AG of AET.

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
Cognition of technology in literacy practice Math	No instances found in SG of Math.	No instances found in AG of Math.	Cognition of technology in literacy practice EP	<ol style="list-style-type: none"> <li>1. <u>"Inspect and check machines in readiness to achieve job specifications"</u> (SO7.4.1, LO8);</li> <li>2. <u>"Identify and select cutting machines and lubricants in accordance with manufacturer's specifications"</u> (SO7.4.1, LO8);</li> <li>3. <u>"Apply to the machine a programme</u> that is compatible with the process and drip feeding" (SO7.5.3, LO1);</li> <li>4. <u>"Prepare the machine by setting the tool lengths and zeroing axes X, Y and Z"</u> (SO7.5.3, LO2).</li> </ol>	<ol style="list-style-type: none"> <li>1. <u>"Machines are inspected and checked in readiness to achieve job specifications"</u> (SO4.1, AS6);</li> <li>2. <u>"Cutting machines and lubricants are identified and selected in accordance with manufacturer's specifications"</u> (SO4.1, AS8);</li> <li>3. <u>The programme applied to the machine is compatible</u> with the process and drip feeding (SO5.3, AS1);</li> <li>4. <u>Machine is prepared by applying settings</u> (SO5.3, AS2).</li> </ol>
Cognition of technology in literacy practice LO	<ol style="list-style-type: none"> <li>1. Explain the value of an <u>online job application and posting CV on the Internet</u> (SO1.2, LO3);</li> <li>2. <u>"Using the Internet for various online applications and social communication purposes"</u> – refer ranges p.15 (SO 9.1, LO1-2).</li> </ol>	No instances found in AG of LO.	Cognition of technology in literacy practice PEP	<ol style="list-style-type: none"> <li>1. <u>"Identify and explain different computer hardware devices and their functions in the engineering field"</u> (SO7.4.1, LO1-4);</li> <li>2. <u>Compare computer languages and software systems</u> (SO7.4.2, LO1&amp;4).</li> </ol>	<ol style="list-style-type: none"> <li>1. <u>"Functions of memory and storage devices are explained"</u> (SO4.1, AS1);</li> <li>2. <u>"The difference between input and output devices are identified and discussed"</u> (SO4.1, AS2);</li> <li>3. <u>"Computer languages and concepts of complex software systems are discussed"</u> (SO4.2, AS1).</li> </ol>

### B3. Recorded instances for integration and application of functional literacy practices

The instances for integration and functional use of literacy were recorded as: (i) Apply literacy practices in context; (ii) Use and integrate multi-modal texts; (iii) Produce multi-modal texts and (iv) Use and integrate technology in literacy practices (refer section 3.2).

**Table B4:** *Recorded instances for integration and application of functional literacy practices*

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
Apply literacy practices in context EFAL	<ol style="list-style-type: none"> <li>1. <u>Take and review notes</u> (SO1.1, LO4&amp;6);</li> <li>2. <u>"Summarise the main points</u> of a listening text by <u>writing a précis"</u> (SO1.1, LO7);</li> <li>3. <u>Respond to the verbal (oral) text by answering</u> critical questions (SO1.1, LO8);</li> </ol>	<ol style="list-style-type: none"> <li>1. <u>Notes are taken and reviewed</u> (SO1.1, AS4&amp;6);</li> <li>2. <u>"Main points of a listening texts are summarised</u> in a précis" (SO1.1, AS7);</li> <li>3. <u>"Critical questions</u> based on the listening texts <u>are answered"</u> (SO1.1, AS8);</li> </ol>	Apply literacy practices in context AET	<ol style="list-style-type: none"> <li>1. <u>"Carry out a diagnostic analysis on mechanical equipment and report the findings"</u> (SO7.1.3, LO2);</li> <li>2. <u>Demarcate the location</u> of machines and walk ways by <u>placing warning and informative signs</u> (SO7.1.4, LO1&amp;4);</li> </ol>	<ol style="list-style-type: none"> <li>1. <u>"Forces acting in the members of a simply supported structure are calculated and described</u> in terms of their effects on the structure" (SO2.1, AS2);</li> </ol>

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
	<p>4. "Plan, research and organise ideas and information" (SO1.2, LO1);</p> <p>5. Practise <u>speaking in a variety of contexts</u> – refer range p.9 (SO1.2, LO2);</p> <p>6. "<u>Respond appropriately to questions</u>" – relates to verbal responses in context (SO1.2, LO5);</p> <p>7. <u>Examine multi-modal reading and creative texts thoroughly and make predictions</u> – refer ranges p.10 (SO2.1, LO1&amp;2);</p> <p>8. <u>Read and understand texts</u> at a whole text level - refer range p.11 (SO2.1, LO4);</p> <p>9. "<u>Summarise the main points</u> of a written text by <u>writing a précis</u>" (SO2.1, LO10);</p> <p>10. <u>Infer meaning and effectiveness from visual and other multi-modal texts</u> (SO2.2, LO3&amp;5);</p> <p>11. "<u>Recognise the emotions</u> evoked by the visual text" (SO2.2, LO4);</p> <p>12. <u>Write and present texts</u> for a wide range of value and purposes and audiences appropriate to diverse contexts – refer range p.12 (SO3.1);</p> <p>13. "<u>Write a first draft</u>" (SO3.1, LO2);</p> <p>14. Make <u>use of an appropriate voice, correct punctuation, spelling, sentence structure and paragraphing in writing</u> (SO3.1, LO3&amp;4);</p> <p>15. "<u>Apply appropriate argument structure and language features of a persuasive text</u>" (SO3.1, LO5);</p> <p>16. <u>Edit, proofread and incorporate feedback into a final draft of writing</u> (SO3.1, LO6&amp;8).</p> <p>17. "Accurately <u>identify and apply a range of language structures and grammar conventions</u> of South African English in diverse contexts" – refer range p.13 (SO4.2, LO1).</p>	<p>4. "A <u>variety of reading strategies are applied</u> to comprehend, analyse, synthesise and appreciate language and information" (SO2.1, AS1);</p> <p>5. Comprehension of reading and creative texts is demonstrated by <u>answering questions accurately</u> (SO2.1, AS4);</p> <p>6. <u>Information in reading and creative texts is summarised</u> (SO2.1, AS5);</p> <p>7. "A <u>variety of viewing strategies are applied</u> to comprehend, analyse, synthesis and appreciate language and information" (SO2.2, AS1);</p> <p>8. "<u>Writing strategies and techniques are used for first drafts</u>" (SO3.1, AS2);</p> <p>9. "Language structures and conventions are used to <u>create and write texts</u> that are appropriate, logical as well as stylistically and grammatically correct" (SO3.1, AS3);</p> <p>10. "<u>Own writing is proofread and edited to produce final texts</u>" (SO3.1, LO5);</p> <p>11. <u>Final texts are presented in line with the conventions and formats required by the context</u> (SO3.1, LO6);</p> <p>12. Assessment tasks (EFAL AG), in which <u>academic literacy practices are applied</u>, include:</p> <ul style="list-style-type: none"> <li>o Portfolio of evidence (Section C of AG)</li> <li>o Formal test inclusive of comprehension and summary or précis, contextual questions for language and grammar structures and communication theory (ICASS table, SO 2.1, 4.1)</li> <li>o Literature assignment relating to a film study and/or novel (ICASS table, SO 2.2)</li> <li>o Oral presentation or speech (ICASS table, SO 1.2)</li> <li>o Listening test/comprehension (ICASS table, SO 1.1)</li> </ul>		<p>3. "<u>Perform calculations</u> of bending moments and shear forces applicable to the design" – relates to numeracy (SO7.2.1, LO3);</p> <p>4. "<u>Apply calculations and their representation in the prototype design</u>" relates to numeracy and literacy practices in design texts (SO7.2.2, LO1);</p> <p>5. "<u>Apply new design concepts onto an illustrative plan</u>" (SO7.3.2, LO1);</p> <p>6. Assimilate operating conditions for prototype, <u>record and analyse test results</u> – relates to reading and writing practices (SO7.3.3, LO1-3);</p> <p>7. Evaluate modification to prototype and <u>record the results</u> (SO7.4.3, LO4).</p>	<p>2. Assessment tasks (AET AG), in which <u>academic literacy practices are applied</u>, include:</p> <ul style="list-style-type: none"> <li>o Portfolio of evidence (Section C of AG)</li> <li>o Written test (SO 1.1, 1.2, 1.3, 1.4, 2.1, 3.1, 4.1)</li> <li>o Practical project (SO 2.2, 2.3, 3.2, 3.3, 4.2, 4.3)</li> <li>o Demonstrations (SO 1.1, 1.2, 1.3, 1.4, 3.1, 4.4)</li> <li>o Illustrations (SO 1.1, 1.2, 1.3, 1.4, 2.1, 3.1, 4.1)</li> <li>o Group discussions (SO 1.1, 1.2, 1.3, 1.4, 2.1, 3.1)</li> <li>o Sketches (SO 1.1, 1.2, 1.3, 1.4, 4.1)</li> <li>o Drawings (SO 2.1, 3.1, 4.1).</li> </ul>

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
		<ul style="list-style-type: none"> <li>o Functional writing tasks such as articles, reports, letters, proposals, CV (ICASS table, SO 3.1)</li> <li>o Examination Papers (ICASS table).</li> </ul>			
Apply literacy practices in context Math	<ol style="list-style-type: none"> <li>1. "<u>Work with complex numbers</u>" (SO1.1, LO1-4);</li> <li>2. "<u>Solve problems using complex numbers</u>" (SO1.1, LO1-2);</li> <li>3. <u>Work with algebraic expressions using and applying the remainder and the factor theorems</u> (SO2.1, LO1-2); [academic literacy]</li> <li>4. "<u>Use instantaneous rate of change of a variable when interpreting models both in mathematical and real-life situations</u>" (SO2.4, LO3-7);</li> <li>5. <u>Analyse and represent mathematical and contextual situations using integrals and integration rules</u> (SO2.5, LO2-3);</li> <li>6. "<u>Use the Cartesian co-ordinate system to derive and apply equations</u>" (SO3.1, LO1-2)</li> <li>7. "<u>State and apply the following theorems of circles</u>" (SO3.2, LO2);</li> <li>8. "<u>Solve problems by constructing and interpreting trigonometric models</u>" (SO3.3, LO1-5); [academic literacy]</li> <li>9. "<u>Represent, analyse and interpret data using various techniques</u>" (SO4.1, LO2-5)</li> <li>10. <u>Calculate and interpret variance and standard deviation</u> for small sets of data only (SO4.2, LO1-2);</li> <li>11. "<u>Make predictions based on validated experimental or theoretical probabilities</u>" – relates to application of mathematical theory (SO4.3, LO2);</li> <li>12. "<u>Interpret and clearly communicate results of probability experiments correctly in terms of real context</u>" (SO4.3, LO4).</li> <li>13. "<u>Use mathematics to plan and control financial instruments</u>" (5.1, LO1-3).</li> </ol>	<ol style="list-style-type: none"> <li>1. <u>Operations are performed to work with complex numbers</u> in standard and polar form (SO1.1, AS 1-3);</li> <li>2. "<u>Complex numbers are used to solve problems</u>" (SO1.2, AS2);</li> <li>3. "<u>Know and apply the remainder and the factor theorem</u>" (SO2.1, AS1-2); [academic literacy]</li> <li>4. "<u>Practical problems</u> regarding rates of change of a variable <u>are solved</u>" (SO2.4, AS1-5&amp;7);</li> <li>5. Integrals are found and calculated by using <u>appropriate rules and simplifications correctly</u> – relates to mathematical operations (SO2.5, AS1-2);</li> <li>6. "The Cartesian co-ordinate system is used to derive and <u>apply the equation of a circle with any centre</u>" - relates to mathematical operations (SO3.1, AS1);</li> <li>7. "The Cartesian co-ordinate system is used to derive and <u>apply the equation of a tangent to a circle</u>" - relates to mathematical operations (SO3.1, AS2);</li> <li>8. "The <u>major theorems of circles</u> are stated and <u>applied</u>" – refer range p. 20 (SO3.2, AS2);</li> <li>9. <u>Problems are solved</u> by constructing and interpreting trigonometric models (Math: 3.3, AS1-4); [academic literacy]</li> <li>10. "<u>Statistics is applied</u> to answer questions about problems" (SO4.1, LO2&amp;4);</li> <li>11. "<u>Measures of deviation and dispersion of bivariate data</u> are used, <u>calculated and interpreted</u>" (SO4.2, AS1);</li> <li>12. <u>Variance and regression analysis is used to predict outcome of a given problem</u> (AS4.2, AS4);</li> </ol>	Apply literacy practices in context EP	<ol style="list-style-type: none"> <li>1. "<u>Record service information</u>" – see range p.5 (SO7.1.2, LO1);</li> <li>2. "<u>Record reasoning</u> for component replacement" (SO7.2.2, LO3);</li> <li>3. "<u>Check and run assembly and record result</u>" (SO7.2.3, LO3);</li> <li>4. <u>Read, understand and apply drawing information to task</u> (SO7.3.1, LO3-4);</li> <li>5. "<u>Understand and follow verbal or written instructions</u> in accordance with workplace procedures" (EP, 7.3.1, LO10);</li> <li>6. "<u>Identify and report non-conformance to job specifications</u>" (SO7.4.3, LO2).</li> </ol>	<ol style="list-style-type: none"> <li>1. "<u>Service information is recorded</u>" (SO1.2, AS1);</li> <li>2. "<u>Component replacement is recorded with reasons</u>" (SO2.2, AS3);</li> <li>3. "<u>Assembly is checked and run and the results are recorded</u>" (SO2.3, AS3);</li> <li>4. <u>Drawing information is read, understood and applied to task</u> (SO3.1, AS3-4);</li> <li>5. <u>Verbal and written instructions are followed</u> (SO3.1, AS10);</li> <li>6. <u>Report on non-conformance of cut material</u> (SO4.3, AS2);</li> <li>7. Assessment tasks (EP AG), in which <u>academic literacy practices are applied</u>, include: <ul style="list-style-type: none"> <li>o Portfolio of evidence (Section C of AG)</li> <li>o Written test (SO 1.1, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3)</li> <li>o Practical project (SO 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3)</li> <li>o Record sheet or log books (SO 1.2)</li> <li>o Report (SO 2.2).</li> </ul> </li> </ol>

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
		<p>13. <u>"Predictions are made based on validated experimental or theoretical probabilities"</u> (SO4.3, AS2);</p> <p>14. <u>"Results are interpreted correctly and clearly communicated"</u> (SO4.3, AS4);</p> <p>15. <u>Mathematical growth and decay formulae are used and applied</u> to solve finance-related problems (SO5.1, AS1&amp;3);</p> <p>16. Assessment tasks (Math AG), in which <u>academic literacy practices are applied</u>, include:</p> <ul style="list-style-type: none"> <li>o Portfolio of evidence (Section C of AG)</li> <li>o Written Test (ICASS Table, p.10; SO 1.1, 1.2, 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.2, 3.3, 4.2, 4.3, 5.1)</li> <li>o Assignment (ICASS Table, p.10; SO 1.1, 1.2, 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 5.1)</li> <li>o Practical Assessment or Exercise (ICASS Table, p.10; SO 2.5, 3.2, 4.2, 4.3, 5.1)</li> <li>o Examination paper (AG ICASS Guide, p.10; SO 1.1, 1.2, 2.1, 2.2, 2.3, 2.4, 2.5, 3.1, 3.2, 3.3, 4.2, 4.3, 5.1)</li> <li>o Discussion (SO 4.1)</li> <li>o Group Activities (SO 4.1).</li> </ul>			
Apply literacy practices in context LO	<p>1. <u>A revised personal development plan (PDP) is compiled</u> in terms of chosen career path (SO1.1);</p> <p>2. <u>"Draft and update a brief CV"</u> (SO1.2, LO1);</p> <p>3. <u>"Prepare and type documents to lodge a job application"</u> – refer range p.8 (SO1.2, LO2);</p> <p>4. <u>"List typical interview questions and prepare suitable answers"</u> (SO1.3, LO4);</p> <p>5. <u>"Investigate and calculate the costs of having a baby and raising a child"</u>– relates to numeracy (SO1.4, LO4);</p> <p>6. <u>"Apply reflective strategies and techniques to personal learning experiences and studies"</u> – implies academic literacy practice (SO2.1, LO3);</p>	<p>1. <u>"A PDP is developed"</u> – relates to document literacy (SO1.1, AS1);</p> <p>2. <u>"Job application toolkit is compiled"</u> - relates to document literacy (SO1.2, AS1);</p> <p>3. Students <u>investigate child abuse reporting processes</u> – implies research as academic literacy practice (SO1.4, AT3);</p> <p>4. <u>"Students analyse case studies to apply logical reasoning and argument"</u> – implies academic literacy practice (SO2.1, AT1);</p> <p>5. <u>"Action plans to manage stress are developed"</u> – relates to document literacy (SO3.1, AS6);</p> <p>6. <u>"An appropriate nutritional plan for people living with HIV and AIDS is developed"</u> – relates to document literacy (SO3.3, AS2);</p>	Apply literacy practices in context PEP	<p>1. <u>"Perform after sales service with clientele"</u> – refer to range p.5, i.e. <u>periodical telephone contact, discussions about products, conferences</u> (SO7.1.2, LO3);</p> <p>2. <u>Structure, compile and present a comprehensive technical report</u> (SO7.3.3, LO3-5).</p>	<p>1. <u>"Report is structured, compiled and presented"</u> (PEP, 3.3, AS3);</p> <p>2. Assessment tasks (PEP AG), in which <u>academic literacy practices are applied</u>, include:</p> <ul style="list-style-type: none"> <li>o Portfolio of evidence (Section C of AG)</li> <li>o Written test and case study (SO 1.1, 1.2, 1.4, 3.1)</li> <li>o Computer test (SO 4.2, 4.3)</li> <li>o Practical project (SO 1.3, 3.2)</li> <li>o Presentations (SO 3.1, 3.3)</li> <li>o Exercises (SO 1.1, 1.4, 2.1, 4.1)</li> <li>o Group discussions (SO 4.1)</li> <li>o Constructing a model (SO 3.1)</li> <li>o Report (SO 3.3).</li> </ul>

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
	<p>7. <u>"Track academic progress</u> in all subjects and <u>devise an action plan</u> to maintain or improve academic performance" - relates to academic literacy practice (SO2.2, LO6).</p> <p>8. <u>Stress management plans are developed</u> - relates to document literacy (SO3.1, LO7).</p>	<p>7. "Students <u>analyse case studies and scenarios</u> to suggest ways to counter stigma, discrimination and human rights violations related to HIV and TB" – implies academic literacy practice (SO3.3, AT1);</p> <p>8. Students <u>analyse case studies and scenarios</u> to advise victims regarding workers' rights - implies academic literacy practice (SO4, AT1);</p> <p>9. Assessment tasks (LO AG), in which <u>academic literacy practices are applied</u>, include:</p> <ul style="list-style-type: none"> <li>o Portfolio of evidence (Section C of AG)</li> <li>o Formal test (ICASS table, p.9-10)</li> <li>o Examination paper (ICASS table, p.9-10)</li> <li>o Practical or project assignment (ICASS table, p.9-10; SO1.1, 3.1, 3.4, 4.3)</li> <li>o Role Play (SO 1.3, 1.4)</li> <li>o Scenarios &amp; case studies (SO 1.3, 2.1, 3.3, 4.2)</li> <li>o Research &amp; Investigations (SO 1.4)</li> <li>o Outings (SO 3.1).</li> </ul>			
Use and integrate multi-modal texts EFAL	<p>1. <u>"Use feedback to improve on their listening performance"</u> - relates to incorporating verbal or non-verbal feedback to improve literacy practice (SO1.1, LO9);</p> <p>2. <u>"Use non-verbal communication effectively when speaking"</u> (SO1.2, LO9);</p> <p>3. <u>"Critically read texts and formulate insightful responses to the intended message"</u> – refer range of multi-modal texts p.10 (SO2.1);</p> <p>4. <u>"Respond to feedback to improve their performance"</u> - relates to incorporating verbal or written feedback to improve literacy practice (SO2.1, LO12);</p> <p>5. <u>"Critically read/view multimodal forms of communication and formulate insightful responses to the intended meaning"</u> - refer ranges p.11 (SO2.2);</p> <p>6. <u>Infer meaning and effectiveness from visual and other multi-modal texts</u> (SO2.2, LO3&amp;5);</p>	<p>1. <u>Feedback is used to improve on subsequent performances</u> - relates to incorporating verbal or non-verbal feedback to improve literacy practice (SO1.1, AS9);</p> <p>2. <u>Oral presentations (multi-modal) are evaluated</u> using appropriate speaking techniques (SO1.2, AS4);</p> <p>3. <u>"Written texts are investigated to explain meaning, values and attitudes"</u> – refer multi-modal text range p.15 (SO2.1, AS2);</p> <p>4. <u>"Visual texts are investigated to explain meaning, values and attitudes"</u> – refer range of visual texts p.16 (SO, 2.2, AS2);</p> <p>5. <u>"Different forms of multimodal communication are examined and interpreted</u> to explain meaning, values and attitudes" – refer range of multi-modal texts p.16 (SO2.2, AS4);</p>	Use and integrate multi-modal texts AET	<p>1. <u>"Ensure that warning and informative signs are appropriately positioned"</u> (SO7.1.4, LO4);</p> <p>2. <u>"Explain with sketches</u> the difference between point loading and distributed loading" (SO7.2.1, LO1);</p> <p>3. <u>"Interpret the prototype</u> of a structure, its constructional design and relevancy to the point of application" (SO7.2.2, LO3);</p> <p>4. <u>"Interpret illustrations and create a new prototype design"</u> (SO7.3.2, LO2);</p> <p>5. <u>"Examine the prototype for comparisons of previous design faults"</u> – relates to reading and interpreting the design (SO7.3.2, LO3);</p> <p>6. <u>"Check all specifications, their corrections and identify them in the prototype upgrade"</u> (SO7.3.2, LO4).</p>	<p>1. The <u>structure prototype is tested and evaluated against the given specifications of the design problem, and modifications are identified</u>, where necessary (SO2.3, AS1);</p> <p>2. <u>"The prototype, with any necessary modifications made, is justified in terms of the design problem"</u> (SO2.3, AS2);</p> <p>3. <u>Prototype of functional dependant mechanisms and its modifications are tested, evaluated and justified against the given specifications of the design problem</u> (SO3.3, AS1-2);</p> <p>4. <u>"Control systems are described using diagrams to show the structure and components of the systems"</u> (SO4.1, AS1&amp;4).</p>

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
	<p>7. "<u>Recognise the emotions evoked by the visual text</u> and respond critically (SO, 2.2, LO4);</p> <p>8. "<u>Incorporate feedback provided during the writing process to improve subsequent drafts</u>" (SO3.1, LO8).</p>	<p>6. "<u>Feedback from others is analysed and incorporated where necessary into written texts</u>" - relates to incorporating verbal or written feedback to improve literacy practice (SO3.1, AS4).</p>			
Use and integrate multi-modal texts Math	<p>1. "<u>Obtain the equation of any of the following inverse graphs given as a sketch</u>" (SO2.2, LO2);</p> <p>2. "<u>Use mathematical models to investigate linear programming problems</u>" (SO2..3);</p> <p>3. <u>Determine the area under a curve by working from a given graph or by sketching a graph</u> (SO2.5, LO3);</p> <p>4. "<u>Use the Cartesian co-ordinate system to derive and apply equations</u>" (SO3.1, LO1-2);</p> <p>5. <u>Solve problems from a given diagram in two and three dimensions</u> by applying trigonometric rules (SO3.3, LO5);</p> <p>6. "<u>Take a position on an issue by comparing different representations of given data</u>". (SO4.1, LO5);</p> <p>7. "<u>Use experiments, simulation and probability distribution to set and explore probability models</u>" (SO4.3).</p>	<p>1. "<u>The Cartesian co-ordinate system is used to derive and apply equations</u>" (SO3.1, AS1-2);</p> <p>2. "<u>Geometry involving straight lines and triangles is used to solve problems in geometrical figures</u>" (SO3.2, AS1);</p> <p>3. <u>Problems in two and three dimensions are solved from a given diagram</u> by using trigonometric rules (SO3.3, AS5).</p> <p>4. "<u>Resolutions are made to maximize efficiency from given data which has been organised and graphically represented</u>" (SO4.1, AS2);</p> <p>5. "<u>Scatter plots are used to represent bivariate numerical data</u>" (SO4.2, AS2);</p> <p>6. "<u>Predictions are made based on validated experimental or theoretical probabilities</u>" (SO4.3, AS2);</p> <p>7. "<u>Tax tables are understood, used and interpreted</u>" (SO5.1, AS2).</p>	Use and integrate multi-modal texts EP	<p>1. "<u>Use component manual for assembly</u>" – text usually includes diagrams and sketches (SO7.1.2, LO2);</p> <p>2. "<u>Apply drawing information to task</u>" (SO7.3.1, LO4);</p> <p>3. "<u>Check measurement of machined component against drawing information</u>" (SO7.3.2, LO4);</p> <p>4. "<u>Check computer program of machine component against drawing measurements</u>" (SO7.3.2, LO5);</p> <p>5. "<u>Check components</u>" – refer to range p.6, i.e. comparing accuracy of machined components to drawings (SO7.3.3, LO1);</p> <p>6. Define and <u>verify the component surfaces and tool processes on drawn outline</u> (SO7.5.2, LO7-8).</p>	<p>1. "<u>Component manual is used for assembly</u>" – text usually includes diagrams and sketches (SO1.2, AS2);</p> <p>2. "<u>Drawing information is applied to task</u>" (SO1.3, AS4);</p> <p>3. "<u>Measurements of machined components are checked against drawing information</u>" (SO3.2, AS4);</p> <p>4. "<u>Computer program of machine component is checked against drawing measurements</u>" (SO3.2, AS5);</p> <p>5. "<u>Components are checked</u> according to operating instructions" – refer range p.14, i.e. checking accuracy pertaining to drawing (SO3.3, AS1);</p> <p>6. "<u>Drawing of the outline for the manufacturing of the final product enables machining of the product</u>" (SO5.2, AS6);</p> <p>7. The component surfaces and tool processes are defined and <u>verified on the drawn outline</u> (SO5.2, AS7-8).</p>
Use and integrate multi-modal texts LO	<p>1. "<u>Use case studies and problem scenarios to develop logical reasoning and argument skills</u>" (SO2.1, LO1);</p> <p>2. "<u>Describe basic workers' rights and responsibilities as cited in labour legislation</u>" – relates to interpreting legislative texts and using the website of the Department of Labour to access resources, range p.11 (SO4.1, LO4);</p> <p>3. "<u>Create a data table report using the report wizard tool to select layout, orientation and style</u>" (SO8.3, LO1).</p>	<p>1. "<u>Students respond to scenarios and cartoons showing a range of interview behaviours</u>" (SO1.3, AT2);</p> <p>2. "<u>Case studies and problem scenarios are used to develop logical reasoning and argument skills</u>" (SO2.1, AS1).</p>	Use and integrate multi-modal texts PEP	<p>1. "<u>Use engineering drawings and diagrams to construct small-scale models to demonstrate understanding of the given drawing</u>" (SO7.3.1, LO3).</p>	

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
Produce multi-modal texts EFAL	<ol style="list-style-type: none"> <li>1. "Present an unprepared speech" – relates to incorporating linguistic, aural and gestural modes (SO1.2, LO7);</li> <li>2. "Prepare and present a fully integrated multimedia group presentation" (SO1.2, LO8);</li> <li>3. "Reproduce the text types in their own writing" – refer ranges p.10 (SO2.1, LO11);</li> <li>4. "Plan for a persuasive writing task (brainstorming, mind-mapping, etc.) and organise information according to the structure and features of the required text type" (SO3.1, LO1);</li> <li>5. "Present a final draft using the conventions and formats required by the context" – refer range of multi-modal texts p.12 (SO3.1, LO7).</li> </ol>	<ol style="list-style-type: none"> <li>1. "Oral presentations are researched, planned and delivered in diverse contexts" - relates to incorporating linguistic, aural and gestural modes (SO1.2, AS3);</li> <li>2. "Text types are reproduced" – refer ranges p.15 (SO2.1, AS6).</li> <li>3. "Own writing is proofread and edited to produce final texts" (SO3.1, AS5);</li> <li>4. "Final texts are presented using the conventions and formats required by the context" – refer ranges p.17 (SO3.1, AS6).</li> </ol>	Produce multi-modal texts AET	<ol style="list-style-type: none"> <li>1. "Explain with examples beam loading, identifying the different fields/methods of application" – relates to illustrations and drawings (SO7.2.1, LO2)</li> <li>2. "Design and construct a prototype of a structure for a given design problem" (SO7.2.2, LO2);</li> <li>3. "Apply new design concepts onto an illustrative plan" (SO7.3.2, LO1);</li> <li>4. "Interpret illustrations and create a new prototype design" (SO7.3.2, LO2);</li> <li>5. Illustrate diagrammatically different control systems (AET, 7.4.1, LO1&amp;4).</li> </ol>	<ol style="list-style-type: none"> <li>1. "Interpret, draw and make calculations of a minimally engineered, supported structure" (SO2.1, AS1&amp;3);</li> <li>2. Construction of the prototype solves the design problem and includes material/s and construction processes (SO2.2, AS1-2);</li> <li>3. "Test and evaluate the prototype and make any necessary modifications" (SO2.3, AS2);</li> <li>4. Prototype with modifications solves design problem (SO3.2, AS2-3);</li> <li>5. "Explain and sketch different control systems" (SO4.1, AS2-3);</li> <li>6. "Construct a control system to solve a given design problem" (SO4.2, AS2&amp;4).</li> <li>7. Safe work practices for working with mechanical equipment in accordance with organisational requirements are demonstrated – could refer to visual or practical demonstration (SO4.4, AS2).</li> </ol>
Produce multi-modal texts Math	<ol style="list-style-type: none"> <li>1. "Investigate and represent a wide range of algebraic expressions and functions and solve related problems" (SLO2, p.4);</li> <li>2. "Sketch the graphs of the inverse of the functions" (SO2.2, LO2);</li> <li>3. "Draw graphs of cubic functions" (Math, 2.4, LO6);</li> <li>4. "Represent bivariate numerical data as a scatter plot" (SO4.2, LO3);</li> <li>5. "Draw the intuitive line of best fit" (SO4.2, LO5);</li> <li>6. Draw Tree diagrams, Venn diagrams to solve probability problems (SO4.3, LO3).</li> </ol>	<ol style="list-style-type: none"> <li>1. "Cubic functions are sketched by using differentiation" (SO2.4, AS6);</li> <li>2. "Scatter plots are used to represent bivariate numerical data" (SO4.2, AS2);</li> <li>3. "Tree diagrams, Venn diagrams and contingency two-way tables are drawn/completed to solve probability problems" (SO4.3, AS3).</li> </ol>	Produce multi-modal texts EP	<ol style="list-style-type: none"> <li>1. "Convert the planned machining operation into a set of instructions and draw up the operation planning sheet" (SP7.5.2, LO5);</li> <li>2. "Draw the outline for the manufacturing of the final product enabling the machining of the product" (EP, 7.5.2, LO6).</li> </ol>	<ol style="list-style-type: none"> <li>1. The planned machining operation is converted into a set of instructions and the operation planning sheet is drawn up" (5.2, AS5);</li> <li>2. Assessment tasks (EP AG) in which multi-modal texts will be produced include: <ul style="list-style-type: none"> <li>o Practical project (SO 1.1, 1.2, 1.3, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3)</li> <li>o Demonstration (SO 1.1, 2.1, 2.2, 2.3, 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3)</li> <li>o Role play (SO 3.1)</li> <li>o Simulation (SO 2.3, 3.1, 3.2, 5.1, 5.2, 5.3, 6.1, 6.2, 6.3).</li> </ul> </li> </ol>
Produce multi-modal texts LO	<ol style="list-style-type: none"> <li>1. "Create a column, line and pie chart" (SO7.3, LO1);</li> <li>2. "Create a data table report using the report wizard tool to select layout, orientation and style" (SO8.3, LO1).</li> </ol>	<ol style="list-style-type: none"> <li>1. "Students role play good interview behaviour" (SO1.3, AT1);</li> <li>2. "Students create a PPT to showcase strategies for showing care, love and respect for children" (SO1.4, AT2);</li> <li>3. Students submit typed reports on the outing (SO3.1, AT2);</li> </ol>	Produce multi-modal texts PEP	<ol style="list-style-type: none"> <li>1. "Make a presentation to demonstrate understanding of the given sketch, drawing or graph" (SO7.3.1, LO2);</li> <li>2. "Use engineering drawings and diagrams to construct small-scale models to demonstrate understanding of the given drawing" (SO7.3.1, LO3);</li> </ol>	<ol style="list-style-type: none"> <li>1. "Small-scale models are constructed to show understanding of the sketch" (SO3.1, AS2);</li> <li>2. Different system representations are identified, discussed and designed using a block diagram, a flow chart, a logical network in an inclusive project (SO3.2, AS1);</li> </ol>

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
		<ol style="list-style-type: none"> <li>4. "Students use the computer to <u>create inspirational messages</u> to affirm and comfort depressed peers" (SO3.2, AT2);</li> <li>5. "Students <u>produce road safety promotional material</u> on the computer" (SO3.4, AT2);</li> <li>6. Students <u>create graphs</u> to show the link between traffic accidents and alcohol abuse (SO3.4, AT3);</li> <li>7. "<u>Election posters and ballot papers</u> are <u>created</u> on computers" (SO4.3, AT2);</li> <li>8. "A <u>PPT of at least 8 slides</u> showcasing potential office bearers is created" (SO4.3, AT3);</li> <li>9. "A <u>webpage</u> such as a Facebook page is <u>created and maintained</u> to promote the election campaign" (SO4.3, AT4);</li> <li>10. <u>Election reports</u> are typed using a computer (SO4.3, AT8);</li> <li>11. "A <u>short video clip is created</u>" (SO4.3, AT5);</li> <li>12. "Results are captured in Excel and <u>graphs produced to indicate voting patterns</u>" (SO4.3, AT7);</li> <li>13. "<u>Charts are created and edited</u> within a spreadsheet" – refer range p.24 (SO7.3, AS1).</li> </ol>		<ol style="list-style-type: none"> <li>3. <u>Design system representations</u> – refer to range p.6, i.e. block diagrams, flow charts and/or logical networks (SO7.3.1, LO2-4);</li> <li>4. Structure, <u>compile and present a comprehensive technical report</u> (SO7.3.3, LO3-5);</li> <li>5. "Use software tools to <u>produce spreadsheets</u>" – refer to range inclusive of CAD p. 7 (SO7.4.3, LO1);</li> <li>6. "Use specialised software tools to <u>produce graphics and drawings</u> – refer to range inclusive of CAD p.7 (SO7.4.3, LO2).</li> </ol>	<ol style="list-style-type: none"> <li>3. A <u>report on data received</u> is structured, compiled and presented (SO3.3, AS3).</li> </ol>
Use and integrate technology in literacy practices EFAL	<ol style="list-style-type: none"> <li>1. "<u>Navigate the Internet</u> to access texts regarding current events" (SO2.1, LO6).</li> </ol>	No instances found in AG of EFAL.	Use and integrate technology in literacy practices AET	No instances found in SG of AET.	No instances found in AG of AET.
Use and integrate technology in literacy practices Math	No instances found in SG of Math.	No instances found in AG of Math.	Use and integrate technology in literacy practices EP	<ol style="list-style-type: none"> <li>1. "<u>Adjust machine settings for the required functions</u>" – relates to operating engineering machines such as hydraulic and drill presses (SO7.3.1, LO5);</li> <li>2. "Make <u>corrections to computer program</u> if necessary" (SO7.3.2, LO6);</li> </ol>	<ol style="list-style-type: none"> <li>1. "<u>Machine settings are adjusted for the required functions</u>" – relates to operating engineering machines such as hydraulic and drill presses (SO3.1, AS5);</li> <li>2. "<u>Computer program of machine component is checked</u> against drawing measurements" (SO3.2, AS5);</li> <li>3. "<u>Corrections to computer program are made</u> if necessary" (SO3.2, AS6);</li> <li>4. "Machining faults are eliminated by <u>correction through specific adjustments</u>" -</li> </ol>

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
				<p>3. "Inspect machine components in <u>CAM</u><sup>28</sup>" (SO7.3.2, LO8);</p> <p>4. "Eliminate machining faults by <u>correction through specific adjustments</u>" - relates to operating engineering machines (SO7.3.2, LO9);</p> <p>5. "Inspect and <u>check machines in readiness to achieve job specifications</u>" (SO7.4.1, LO6);</p> <p>6. <u>Prepare and configure the machine (CAM) and equipment</u> for cutting according specifications (SO7.5.1, LO1-8);</p> <p>7. <u>Simulate the programme to test the CAM specification. Adjust</u> if required (SO7.5.2, LO1-2);</p> <p>8. "<u>Save programme</u> on a disk or hard drive of computer" (SO7.5.2, LO3)</p> <p>9. "<u>Manufacture components using CAM process</u>" – relates to apply, set up and simulate a programme, check machine components and quality according to drawing specifications, adjust and test programme (SO7.5.3, LO1-5, LO7&amp;10).</p>	<p>refer to adjustments to cutting program (SO3.2, AS9);</p> <p>5. The <u>necessary post processor, tools and order of operation</u> are selected for <u>computer-aided machining</u> (SO5.1, AS1-3);</p> <p>6. <u>Primary and secondary machining operations</u> are assessed to <u>suit material type and composition</u> – refers to computer-aided machining (SO5.1, AS4-5);</p> <p>7. <u>Configuration and setting of the machine to suit material type and composition</u> – refers to computer-aided machining (SO5.1, AS6-8);</p> <p>8. "<u>The programme to test</u> for correct drawing dimensions, tooling effect and elimination of tool breakage is <u>simulated</u>" (SO5.2, AS1);</p> <p>9. "The <u>programme is re-edited</u> if adjustments are required" (SO5.2, AS2);</p> <p>10. <u>Programme is saved</u> on a disk or hard drive of the computer (SO5.2, AS3);</p> <p>11. "The <u>programme applied to the machine</u> is compatible with the process and drip feeding" (SO5.3, AS1);</p> <p>12. "The <u>machine is prepared by setting the tools lengths and zeroing axes X, Y and Z</u>" (SO5.3, AS2);</p> <p>13. "The <u>programme is simulated on the machine simulator</u>" (SO5.3, AS3);</p> <p>14. "<u>Components are machined to drawing specifications</u>" - refers to computer-aided machining (SO5.3, AS4);</p> <p>15. <u>Machining program is tested and edited</u> (SO5.3, AS5&amp;7, AS10).</p>

<sup>28</sup> CAM or computer aided machining is a subsequent computer aided process after computer aided design (CAD) and sometimes computer aided engineering (CAE), as the model generated in CAD and verified in CAE can be input into CAM software, which then controls the machine tool.

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
Use and integrate technology in literacy practices LO	<ol style="list-style-type: none"> <li>1. "Prepare and <u>type documents</u> to lodge a job application" – refer range p.8 (SO1.2, LO2);</li> <li>2. "Complete an <u>online job application and post a CV on the Internet</u>" (SO1.2, LO4);</li> <li>3. "<u>Word documents are created, opened, formatted, saved and printed</u> using integrated features" – refer range p.12 (SO6.1, LO2-3);</li> <li>4. "Use the Mail merge feature in a <u>Word document</u>"– refer ranges p.13 (SO6.2, LO1-3);</li> <li>5. "<u>Excel (Spreadsheet) documents are created, opened, formatted, saved and printed</u> using integrated features" – refer range p.13 (SO7.1, LO2-3);</li> <li>6. "Use formulas to <u>perform advanced calculations in a spreadsheet</u>" (SO7.2, LO1);</li> <li>7. "<u>Spell check, preview and print the chart</u>" (SO7.3, LO4);</li> <li>8. "<u>Create a data structure and capture information in a data table</u>" – refer ranges p.14 (SO8.1, LO1&amp;4-6);</li> <li>9. "<u>Edit records and information in a data table</u>" (SO8.2, LO1-3);</li> <li>10. <u>Create a database report</u> based on a table using basic features" - refer ranges p.14 (SO8.3, LO1-3)</li> <li>11. "<u>Use the internet</u> as a communication medium - refer ranges p.15 (SO9.1, LO1-2).</li> </ol>	<ol style="list-style-type: none"> <li>1. "An <u>online audit of job market related skills is completed</u>" (SO1.1, AS3);</li> <li>2. "Students <u>develop a PDP, using the computer</u>" (SO1.1, AT1);</li> <li>3. "An <u>online job application is completed</u> and a <u>CV posted on the Internet</u>" (SO1.2, AS2);</li> <li>4. "Students <u>use the computer</u> to compile the job application toolkit" (SO1.2, AT1);</li> <li>5. "Students <u>use Excel</u> to work out a budget" (SO1.4, AT1);</li> <li>6. "Students <u>post exam writing hints on the Internet</u>" (SO2.2, AT1);</li> <li>7. "Students <u>download exam writing hints from the Internet</u>" (SO2.2, AT2);</li> <li>8. "Students track their academic progress by <u>collating data in Excel and creating bar charts</u>" (SO2.2, AT3);</li> <li>9. Students <u>compile action plans to manage their stress on a computer</u> (SO3.1, AT1);</li> <li>10. Students <u>submit typed reports</u> on the outing (SO3.1, AT2);</li> <li>11. Students <u>run an online helpline</u> to give advice to peers who are depressed (SO3.2, AT1);</li> <li>12. "Students <u>use the computer to create inspirational messages</u> to affirm and comfort depressed peers" (SO3.2, AT2);</li> <li>13. "Students <u>produce road safety promotional material on the computer</u>" (SO3.4, AT2);</li> <li>14. "Students <u>use Excel to capture data</u> on road deaths and <u>create graphs</u>" (SO3.4, AT3);</li> <li>15. "Students <u>send informative emails</u> to peers with strong road safety messages" (SO, 3.4, AT4);</li> <li>16. Students <u>use the computer to create a job contract and a table citing workers' basic rights and responsibilities</u> (SO4.1, AT1&amp;2);</li> <li>17. Students <u>download labour legislation</u> from the Internet (SO4.1, AT3);</li> </ol>	Use and integrate technology in literacy practices PEP	<ol style="list-style-type: none"> <li>1. "<u>Perform a simple in-line code in a high-level language</u>" – relates to applying digital coding practice (SO7.4.2, LO2);</li> <li>2. "<u>Perform simple structured programming</u>" – relates to applying digital coding practices (SO7.4.2, LO3).</li> <li>3. "<u>Use software tools to produce spreadsheets</u>" – refer to range inclusive of CAD p. 7 (SO7.4.3, LO1);</li> <li>4. "<u>Use specialised software tools to produce graphics and drawings</u> – refer to range inclusive of CAD p.7 (SO7.4.3, LO2).</li> </ol>	<ol style="list-style-type: none"> <li>1. <u>Differences and functions of computer hardware devices are explained and discussed</u> – refer to assessment task p.13, i.e. computer exercises using applicable software (SO4.1, AS2);</li> <li>2. "<u>Simple in-line coding and structured programming are performed</u>" (SO4.2, AS1);</li> <li>3. "<u>Software tools are used to produce spreadsheets, graphics and drawings</u>" (SO4.3, AS1).</li> </ol>

Sub- Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub- Categories	SG (Core subject)	AG (Core subject)
		<p>18. "Students <u>send emails</u> to peers <u>with labour legislation documents as attachments</u>" (SO4.1, AT4);</p> <p>19. "Election posters and ballot papers are <u>created on computers</u>" (SO4.3, AT2);</p> <p>20. <u>Election speeches and reports are typed using a computer</u> (SO4.3, AT6&amp;8);</p> <p>21. "<u>Results are captured in Excel</u>" (SO4.3, AT7);</p> <p>22. "Integrated features are used to <u>edit, spell check and print a Word document</u>" – refer ranges p.21 (SO6.1, AS1);</p> <p>23. "<u>A main document is created and spell checked</u> for mailing value and purposes" (SO6.2, AS1);</p> <p>24. <u>A data source file containing the variables is created and printed</u> (SO6.2, AS2);</p> <p>25. "The <u>main document as well as the merge document are printed</u>" (SO6.2, AS3);</p> <p>26. "<u>Integrated features are used to edit, spell check and print a spreadsheet document</u>" - refer ranges p.23 (SO7.1, AS1);</p> <p>27. <u>Charts are created, edited, previewed and printed</u> – refer range p.24 (SO7.3, AS1-2);</p> <p>28. "<u>A database file is created</u>" (SO8.1, AS4);</p> <p>29. <u>A database table structure is created and printed</u> (SO8.1, AS5);</p> <p>30. "<u>Data is entered in a table and records are printed</u>" (SO8.1, AS6);</p> <p>31. "The <u>internet is used for a variety of study and work-related applications</u>" – refer range p.25 (SO9.1, AS1);</p> <p>32. "<u>Social electronic media and networks are used for various communication value and purposes</u>" – refer range p.26 (SO9.1, AS2);</p> <p>33. Assessment tasks (LO AG), in which <u>computer literacy practices are applied</u>, include: Practical task or test or examination (ICASS table, p. 9-10; SO 1.1, 1.2, 1.4, 2.2, 3.1, 3.2,</p>			

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
		3.4, 4.1, 4.3, 6.1, 6.2, 7.1, 7.2, 7.3, 8.1, 8.2, 8.3, 9.1).			

#### B4. Recorded instances for mastery of capabilities and manifestation of a literate identity

The instances for mastery of literacy capabilities and manifestation of literate identity were recorded as the following elements: (i) Mastered capabilities manifest as literate identity and behaviour; (ii) Employability and work attributes are demonstrated in literacy practices (iii) Sensitivity to work process flow and standard for performance and (iv) Requirements for supervision or mediation diminishes.

**Table B5: Recorded instances for mastery of capabilities and manifestation of a literate identity**

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
Literate identity EFAL	<ol style="list-style-type: none"> <li>1. "Listen for <u>appreciation</u>" – implies a level of literacy as <u>ingrained behaviour</u> more than mere functional use (SO1.1, LO5);</li> <li>2. "<u>Use feedback to improve on their listening performance</u>" - relates to confidence and identity in literacy practice (SO1.1, LO9);</li> <li>3. <u>Express appreciation and enjoyment</u> related to aspects of creative texts – relates to expressing own views (SO1.2, LO11);</li> <li>4. "<u>Provide constructive feedback</u> to other speakers" – relates to confidence and identity in literacy practice (SO1.2, LO12);</li> <li>5. "<u>Reflect on and improve their performance</u>" – relates to confidence and identity in literacy practice (SO1.2, LO13);</li> <li>6. "Engage in <u>extended reading for enjoyment</u>" -implies a level of literacy as <u>ingrained behaviour</u> more than mere functional use (SO2.1, LO5);</li> <li>7. "<u>Incorporate explicit feedback into their work to improve their performance</u>" - relates to</li> </ol>	<ol style="list-style-type: none"> <li>1. "<u>Appreciation is expressed</u> in response to listening texts" – implies a level of literacy as <u>ingrained behaviour</u> more than mere functional use (SO1.1, AS5);</li> <li>2. "<u>Feedback is used to improve on subsequent performances</u>" - relates to confidence and identity in literacy practice (SO1.1, AS9).</li> </ol>	Literate identity AET	No instances found in SG of AET.	No instances found in AG of AET.

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
	confidence and identity in literacy practice (viewing texts) (SO2.2, LO6); 8. " <u>Incorporate feedback provided during the writing process to improve subsequent drafts</u> " - relates to confidence and identity in literacy practice (SO3.1, LO8).				
Literate identity Math	1. " <u>Justify and apply statistics</u> to answer questions about problems" (SO4.1, LO3). 2. " <u>Take a position on an issue</u> by comparing different representations of given data" – relates to confidence in literacy practice (SO4.1, LO5).	1. " <u>Resolutions are made to maximize efficiency</u> from given data which has been organised and graphically represented" – relates to confidence in literacy practice (SO4.1, AS2).	Literate identity EP	No instances found in SG of EP.	No instances found in AG of EP.
Literate identity LO	No instances found in SG of LO.	No instances found in AG of LO.	Literate identity PEP	No instances found in SG of PEP.	No instances found in AG of PEP.
Employability attributes EFAL	1 " <u>Use non-verbal communication effectively</u> " (SO1.2, LO9); 2 "Study and use a variety of theories <u>to improve effectiveness of 'communication in diverse contexts'</u> " (SO4.1).	1 " <u>Different forms of oral communication are used in diverse contexts</u> " (SO1.2, AS4).	Employability attributes AET	No instances found in SG of AET.	1. No instances found in AG of AET.
Employability attributes Math	1 " <u>Interpret and clearly communicate results</u> of the experiments correctly in terms of real context" (SO4.3, LO4).	1 " <u>Results are interpreted correctly and clearly communicated</u> " (SO4.3, AS4).	Employability attributes EP	1. " <u>Communicate understanding</u> of verbal instructions" (SO7.3.1, LO2).	1. " <u>Understanding of verbal instructions is communicated</u> " (SO7.3.1, AS2).
Employability attributes LO	1. " <u>Explain and factor into plan how to continue developing employability and job market related skills sets</u> " (SO1.1, LO3).	1. "A PDP is developed" – planning own performance and development (SO1.1, AS1-3, AT1-2).	Employability attributes PEP	No instances found in SG of PEP.	No instances found in AG of PEP.
Sensitivity to work process flow and standard for performance EFAL	1 " <u>Use grammatically correct language</u> " (SO1.2, LO10); 2 "Write and present texts for a wide range of purposes and audiences <u>using correct language and grammar structures as well as conventions and formats appropriate to diverse contexts</u> " (SO 3.1, LO4-5&7); 3 "Study and <u>correctly apply a variety of language structures and grammar conventions in diverse settings</u> " (SO4.2); 4 " <u>Accurately identify and apply</u> a range of language structures and grammar conventions of South African English in <u>diverse contexts</u> " (SO4.2, LO1).	1 " <u>Language structures and conventions are used to create and write texts that are appropriate, logical as well as stylistically and grammatically correct</u> "- (SO3.1, AS3); 2 "A range of <u>language structures and grammar conventions of South African English are accurately identified and applied in diverse contexts</u> " (SO4.2, AS1).	Sensitivity to work process flow and standard for performance AET	1. " <u>Design prototype</u> with new and different technological impact, <u>considering a range of factors</u> " – refer range p.6 (SO7.2.2, LO2); 2. " <u>Interpret the prototype</u> , its constructional design and <u>relevancy to the point of application</u> " (SO7.2.2, LO3); 3. " <u>Check all specifications</u> , their corrections and identify them in the prototype upgrade" (SO7.3.2, LO4); 4. " <u>Check prototype against design specifications</u> and analyse results" (SO7.3.3, LO3); 5. " <u>Select the form of a control system and justify components used against the requirements of the design problem</u> " (SO 7.4.2, LO3);	1. The <u>prototype</u> , with modifications made, is <u>tested, evaluated and justified in terms of the design problem</u> (SO2.3, AS1-2); 2. " <u>Specific performance requirements are identified</u> for the design problem" (SO3.2, AS1); 3. " <u>Construction of the prototype solves the design problem and is in accordance with the design process</u> " (SO3.2, AS3); 4. "The prototype is <u>tested and evaluated against the given specifications</u> of the design problem" (SO3.3, AS1); 5. "The <u>prototype</u> , with any necessary modifications made, <u>is justified in terms of the design problem</u> " (SO3.3, AS2);

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
				<p>6. "Make further modification where necessary, <u>taking into account circumstantial considerations</u>" – refer range p. 7, i.e. specific time, skills availability, replacement of parts onsite, time for modification, testing and reversal of the situation (SO7.4.3, LO5);</p> <p>7. "Apply the prototype <u>according to organisational requirements</u>" (SO7.4.4)</p> <p>8. "<u>Demonstrate safe working practices for working with mechanical equipment in accordance with organisational requirements</u>" (SO7.4.4, LO2).</p>	<p>6. "Components are <u>described in terms of requirements for the operation of the control systems</u>" (SO4.1, AS3);</p> <p>7. "The form of a <u>control system</u> is selected and <u>components used against the requirements of the design problem are justified</u>" (SO4.2, AS3);</p> <p>8. "Further modifications are made where necessary, <u>taking into account circumstantial considerations</u>" -refer range p.15 (SO4.3, AS5);</p> <p>9. "<u>Safe work practices for working with mechanical equipment in accordance with organisational requirements are demonstrated</u>" (SO4.4., AS2).</p>
Sensitivity to work process flow and standard for performance Math	No instances found in SG of Math.	No instances found in AG of Math.	Sensitivity to work process flow and standard for performance EP	<p>1. "<u>Check quality of serviced components for compliance with servicing specification and store or move as instructed</u>" – refer range p.5 (SO7.1.3, LO2-4);</p> <p>2. Correctly <u>select and fit</u> the component parts <u>within the specified time</u> (SO7.2.3, LO2);</p> <p>3. "<u>Accommodate environmental conditions relevant to design</u>" – refer to range p. 6, i.e. financial constraints, consumer pressure, political implications, professionalism (SO7.2.3, LO1);</p> <p>4. "Store completed components <u>according to workplace procedures</u>" – refer range p.6 (SO7.3.3, LO2);</p> <p>5. Clean applicable equipment <u>according to manufacturer's specifications</u> (SO7.3.3, LO3);</p> <p>6. "Inspect and <u>check machines in readiness to achieve job specifications</u>" (SO7.4.1, LO6);</p> <p>7. "Identify and <u>select cutting machines and lubricants in accordance with manufacturer's specifications</u>" (SO7.4.1, LO8);</p> <p>8. "Cut materials <u>in accordance to job specifications</u>" (SO7.4.2, LO5);</p>	<p>1. "The replacement parts are <u>suitable to performance and environmental condition</u>" (SO1.1, AS2);</p> <p>2. "The component parts of the assembly are correctly <u>selected and fitted within the specified time</u>" (SO2.3, AS2);</p> <p>3. "Correct equipment and tools are selected for <u>appropriate machining process</u>" (SO3.1, AS6);</p> <p>4. "All significant points are lubricated <u>in accordance with workplace procedures</u>" (SO3.1, AS9);</p> <p>5. "Verbal and written instructions are understood and followed <u>in accordance with workplace procedures</u>" (SO3.1, AS10);</p> <p>6. Machine is operated <u>in accordance with workplace procedures and operational requirements</u> (SO3.2, AS1-2);</p> <p>7. "Completed components are stored <u>according to workplace procedures</u>" – refer range p.14 (SO3.3, AS2);</p> <p>8. "Equipment is cleaned <u>according to manufacturer's specifications</u>" (SO3.3, AS3);</p> <p>9. "Machines are inspected and checked in readiness <u>to achieve job specifications</u>" (SO4.1, AS6);</p>

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
				<p>9. "Confirm blade clearances to achieve shearing consistent with <u>job specifications</u>" (SO7.4.2, LO6);</p> <p>10. "Cut edges to conform <u>to job specification or workplace procedure</u>" (SO7.4.2, LO7);</p> <p>11. <u>Prepare the computer aided machine</u> and equipment for cutting process in terms of <u>design requirements and machine specifications</u> (SO7.5.1, LO4-8);</p> <p>12. "Define and <u>verify the component surfaces on the drawn outline</u>, if necessary, <u>in accordance with the final design and site requirements</u>" (SO7.5.2, LO7);</p> <p>13. "Define and <u>verify tool processes on the drawn outline</u>, if necessary, <u>in accordance with the final design and site requirements</u>" (SO7.5.2, LO8);</p> <p>14. "<u>Machine components to drawing specifications</u>" (SO7.5.3, LO4);</p> <p>15. "Examine components for inaccuracies, <u>making editing adjustments to programme until components meet requirements</u>" (SO7.5.3, LO5);</p> <p>16. "Measure, examine and record the quality of completed components <u>according to specified requirements</u>" (SO7.5.3, LO6);</p> <p>17. <u>Test machining program against the design specification</u> so as to determine conformity to the product design (SO7.5.3, LO7);</p> <p>18. "Set up cutting lubrication to suit the material and check to <u>determine conformity to CAM manufacturer's recommendations</u>" (SO7.5.3, LO8);</p> <p>19. "Check that the <u>manufacturing of components complies with the design specifications, health and safety requirements, and site requirements</u>" (SO7.5.3, LO9);</p> <p>20. "Verify components <u>in relation to the design specifications</u>, and <u>adjust CAM</u>, where</p>	<p>10. "Cutting machines and lubricants are identified and selected <u>in accordance with manufacturer's specifications</u>" (SO4.1, AS8);</p> <p>11. Materials are cut in accordance and conform <u>to job specifications</u> (SO4.2, AS5-7);</p> <p>12. "Cut materials are inspected and measured for <u>compliance to job specifications</u>" (SO4.3, AS1);</p> <p>13. "<u>Non-conformance to job specifications</u> is identified and <u>reported</u>" (SO4.3, AS2);</p> <p>14. "<u>Program</u> is assessed and <u>configured to the design of the project, and to site requirements</u>" (SO5.1, AS7);</p> <p>15. The component surfaces and tool processes are defined and verified on the drawn outline, if necessary, <u>in accordance with the final design and site requirements</u> (SO5.2, AS7-8);</p> <p>16. "Components are machined <u>to drawing specifications</u>" (SO5.3, AS4);</p> <p>17. The quality of completed components is measured, examined and recorded <u>according to specified design requirements</u> (SO5.3, AS5-6&amp;10);</p> <p>18. <u>Machining program is tested against the design specification</u> to determine conformity to the product design (SO5.3, AS7);</p> <p>19. Cutting lubrication to suit the material is set up and checked to <u>determine conformity to CAM manufacturer's recommendations</u> design (SO5.3, AS8);</p> <p>20. "The manufacturing of components <u>complies with the design specifications, health and safety, and site requirements</u>" (SO5.3, AS9);</p> <p>21. Joining systems and methods enable the <u>design and product specifications</u> to be met (SO6.1, AS1-2);</p> <p>22. Joining systems and process are applied <u>in accordance with manufacturer's and site requirements</u>" (SO6.3, AS1);</p>

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
				necessary, to <u>achieve the specification</u> " (SO7.5.3, LO10); 21. "Apply joining systems and process <u>in accordance with manufacturer's and site requirements</u> " (SO7.6.3, LO1); 22. "Use joining techniques <u>in accordance with design and product specifications</u> (SO7.6.3, LO2); 23. Examine and assess joined materials <u>in relation to design, required standard</u> and for redress (SO7.6.3, LO4-5&8). 28	23. "Joining techniques are used <u>in accordance with design and product specifications</u> " (SO6.3, AS2); 29 30
Sensitivity to work process flow and standard for performance LO	No instances found in SG of LO.	No instances found in AG of LO.	Sensitivity to work process flow and standard for performance	No instances found in SG of PEP.	1. Possible <u>environmental problems resulting from engineering are identified and solutions recommended</u> (SO1.3, AS1).
Diminished supervision EFAL	No instances found in SG of EFAL.	No instances found in AG of EFAL.	Diminished supervision AET	No instances found in SG of AET.	No instances found in AG of AET.
Diminished supervision Math	No instances found in SG of Math.	No instances found in AG of Math.	Diminished supervision EP	No instances found in SG of EP.	No instances found in AG of EP.
Diminished supervision LO	No instances found in SG of LO.	No instances found in AG of LO.	Diminished supervision PEP	No instances found in SG of PEP.	No instances found in AG of PEP.

## B5. Recorded instances for critical and creative literacy behaviour

The instances for critical and creative literacy behaviour were recorded as the following elements: (i) Critical literacy behaviour; (ii) Creativity in engagement with complex social and cultural forms (iii) Transforming and adapting literacy practices for the workplace and (iv) Independent literate behaviour.

**Table B6: Recorded instances for critical and creative literacy behaviour**

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
Critical Literacy Behaviour EFAL	<ol style="list-style-type: none"> <li>1. <u>"Listen and respond critically</u> in diverse contexts for a variety of purposes" (SO1.1);</li> <li>2. Listen to <u>critically analyse and evaluate content</u> and <u>infer meaning</u> – refer ranges p.7 (SO1.1, LO2&amp;3);</li> <li>3. <u>"Formulate relevant critical questions</u> for diverse purposes" (SO1.2, LO4);</li> <li>4. <u>Provide constructive feedback</u> to other speakers – relates to interpretation of spoken texts (SO1.2, LO12);</li> <li>5. <u>"Critically read texts</u> and formulate insightful responses to the intended message" (SO2.1);</li> <li>6. <u>"Answer questions critically</u> and accurately" – relates to responding after critical reading of different texts (SO2.1, LO7);</li> <li>7. <u>"Consider the points of view of more than one source in order to reach a conclusion"</u> (SO2.1, LO8);</li> <li>8. <u>Justify own opinion</u> with reference to multi-modal reading texts – relates to critical engagement with texts (SO2.1, LO9);</li> <li>9. <u>"Critically read/view multimodal forms</u> of communication and formulate insightful responses to the intended meaning" (SO2.2, LO5);</li> <li>10. <u>"Answer questions critically</u> and accurately" – relates to responding after critically viewing multi-modal texts (SO2.2, LO2);</li> <li>11. "Recognise the emotions evoked by the visual text and <u>respond critically</u>" (SO2.2, LO4);</li> <li>12. <u>Reflect critically</u> on impact and consequences of media communication (SO4.1, LO3).</li> </ol>	<ol style="list-style-type: none"> <li>1. Texts are <u>critically analysed and evaluated</u> and meaning inferred (SO1.1, AS2&amp;3);</li> <li>2. <u>"A critical awareness of language usage</u> is applied in diverse oral situations" (SO1.2, AS5);</li> <li>3. <u>"Written texts are investigated to explain meaning, values and attitudes"</u> – implies critical engagement (SO2.1, AS2);</li> <li>4. <u>"Visual texts are investigated to explain meaning, values and attitudes"</u> – implies critical engagement (SO2.2, AS2);</li> <li>5. <u>"Different forms of multimodal communication are examined and interpreted</u> to explain meaning, values and attitudes" (SO2.2, AS4);</li> <li>6. "Case studies are used to <u>reflect critically</u> on the impact and consequences of media communication" (SO4.1, AS3).</li> </ol>	Critical Literacy Behaviour AET	No instances found in SG of AET.	No instances found in AG of AET.
Critical Literacy Behaviour Math	<ol style="list-style-type: none"> <li>1. <u>"Use mathematical models to investigate and solve linear programming problems"</u> (SO2.3);</li> </ol>	No instances found in AG of Math.	Critical Literacy Behaviour EP	No instances found in SG of EP.	No instances found in AG of EP.

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
	<p>2. <u>"Use geometry of straight lines and triangles to solve problems and to justify relationships in geometric figures"</u> (SO3.2, LO2);</p> <p>3. <u>"Justify and apply statistics to answer questions about problems"</u> (SO4.1, LO3);</p> <p>4. <u>"Take a position on an issue by comparing different representations of given data"</u> (SO4.1, LO5).</p>				
Critical Literacy Behaviour LO	<p>1. <u>"Differentiate between good and bad interviewee behaviour"</u> (SO1.3, LO5);</p> <p>2. <u>"Use case studies and problem scenarios to develop logical reasoning and argument skills"</u> (SO2.1, LO1);</p> <p>3. <u>"Analyse own exam writing skills and study techniques"</u> – critique own literacy practice (SO2.2, LO1);</p> <p>4. <u>"Critically analyse the role of the IEC in elections"</u> – relates to use of a literacy practice to do so (SO 4.3, LO5).</p>	<p>1. <u>"Case studies and problem scenarios are used to develop logical reasoning and argument skills"</u> (SO2.1, AS1, AT1);</p> <p>2. <u>"Students analyse case studies and scenarios to advise victims of wrongful actions on the correct procedures to follow regarding workers' rights"</u> (SO4.2, AT1);</p> <p>3. <u>"The role of the IEC is critically analysed"</u> – relates to use of a literacy practice to do (SO4.3, AS3).</p>	Critical Literacy Behaviour PEP	<p>1. <u>"Illustrate responsible thinking with respect to environmental impact, with reference to different factors"</u> – refer range p.5 (SO7.1.3, LO1).</p>	<p>1. <u>"Possible environmental problems resulting from engineering are identified and solutions recommended"</u> – refer range p.11 and environmentally-based project (SO7.1.3, AS1, AT1).</p>
Creativity in engagement with complex social and cultural forms EFAL	No instances found in SG of EFAL.	No instances found in AG of EFAL.	Creativity in engagement with complex social and cultural forms AET	<p>1. <u>Apply new design concepts and create a new prototype</u> (SO7.3.2, LO1-2).</p>	No instances found in AG of AET.
Creativity in engagement with complex social and cultural forms Math	<p>1. <u>"Discuss new questions that arise from the modelling of data"</u> (SO4.1, LO4).</p>	No instances found in AG of Math.	Creativity in engagement with complex social and cultural forms EP	No instances found in SG of EP.	No instances found in AG of EP.
Creativity in engagement with complex social and cultural forms LO	No instances found in SG of LO.	<p>1. <u>"Students run an online helpline to give advice to peers who are depressed"</u> (SO3.2, AT1);</p> <p>2. <u>A webpage such as a Facebook page is created and maintained</u> SO4.3, AT4);</p> <p>3. <u>"A short video clip is created or downloaded to insert on YouTube to advertise the election"</u> (SO4.3, AT5).</p>	Creativity in engagement with complex social and cultural forms PEP	No instances found in SG of PEP.	No instances found in AG of PEP.
Transforming and adapting literacy	No instances found in SG of EFAL.	No instances found in AG of EFAL.	Transforming and adapting literacy	No instances found in SG of AET.	No instances found in AG of AET.

Sub-Categories	SG (Fundamental subject)	AG (Fundamental subject)	Sub-Categories	SG (Core subject)	AG (Core subject)
practices for the workplace EFAL			practices for the workplace AET		
Transforming and adapting literacy practices for the workplace Math	No instances found in SG of Math.	No instances found in AG of Math.	Transforming and adapting literacy practices for the workplace EP	No instances found in SG of EP.	No instances found in AG of EP.
Transforming and adapting literacy practices for the workplace LO	No instances found in SG of LO.	No instances found in AG of LO.	Transforming and adapting literacy practices for the workplace PEP	No instances found in SG of PEP.	No instances found in AG of PEP.
Independent literacy behaviour EFAL	No instances found in SG of EFAL.	No instances found in AG of EFAL.	Independent literate behaviour AET	No instances found in SG of AET.	No instances found in AG of AET.
Independent literate behaviour Math	No instances found in SG of Math.	No instances found in AG of Math.	Independent literate behaviour EP	No instances found in SG of AET.	No instances found in AG of AET.
Independent literate behaviour LO	No instances found in SG of LO.	No instances found in AG of LO.	Independent literate behaviour PEP	No instances found in SG of AET.	No instances found in AG of AET.

## ANNEXURE C: ANALYSIS OF LEARNING OUTCOME STATEMENTS

### C1. Analysis of verbs used in learning outcome statements

As explained in sections 3.1, 3.2 and Annexure B, the subject level and learning outcomes were interrogated in terms of the affordances to develop workplace literacy as conceptualised in section 2.6. These findings (instances) were recorded in Annexure B. A further analysis was done in terms of the verbs used in the learning outcome statements. These statements form the essence of what knowledge, skills, values or attitudes are intended to be learned. In each instance, the statement was analysed in terms of what literacy practice would be at play and utilised in the learning and assessment practices. The literacy practice denoted was also recorded. The cells that are shaded are those learning outcome statements where the literacy practice is implied and a definitive link to literacy practice/s is not clear. As stated in B1 subjective or misinterpretation of statements could be the case, although not intentional. Verbs that have been repeated in the learning outcome statements, but have a different connotation in each instance are highlighted in yellow. Furthermore, for ease of comparison in the analysis, the fundamental and core subjects were juxtaposed in the table.

In the discussion of the analysis in 3.5.1 a comparison will be drawn between the fundamental and core subjects in respect of the number of instances where there is no clear link to literacy practice. The analysis was also done in terms of comparing the verbs used with a strong link to workplace literacy practice such as “draw”, “compile” or “communicate” and those that denote academic literacy practice strongly, e.g. “read”, “write”, “explain”.

**Table C1: Analysis of verbs used in learning outcome statements**

Learning Outcome Verb (Fundamental)	Frequency in Core Subject	Denoted Literacy Practice	Learning Outcome Verb	Frequency in Core Subject	Denoted Literacy Practice
Analyse	1 in EFAL	Denotes reading or viewing multi-modal texts such as film, graphical representations, cartoons and television advertisements or programmes.	Accommodate/ Modify	2 in AET	Adjust design to accommodate environmental factors – mastery of capabilities.
Analyse & evaluate	2 in LO	Analyse concepts (e.g. exam writing skills) to demonstrate understanding – literacy practice is implied. Verb is used more as an indicator of cognitive level.	Adjust/ Correct/ Eliminate faults/ Re-edit	4 in EP	Read and interpret multi—modal texts (e.g. digital readings, manual, diagram) in order to produce a work-related activity or text in turn, e.g. adjust machine settings for the required functions – functional literacy level.

Learning Outcome Verb (Fundamental)	Frequency in Core Subject	Denoted Literacy Practice	Learning Outcome Verb	Frequency in Core Subject	Denoted Literacy Practice
Apply & use/ Apply & state / Apply & solve/ Apply & justify	6 in Math	Apply functional numeracy practices (mathematical operation and process) in various contexts.	Analyse/ Identify and analyse/ Analyse and report	3 in AET	Detect design faults or conformity with expectations and specifications and report on them – literate identity.
Apply	2 in LO	Apply functional literacy practice when writing examinations or using a software programme.	Apply	4 in AET	Apply calculations and design principles to create multi-modal designs – functional literacy level.
Calculate / Investigate & calculate	2 in LO	Calculate costs and perform calculations in spreadsheet – functional literacy/numeracy level.	Apply/ Join/ Attach	7 in EP	Read and use multi-modal texts (e.g. digital readings, information tag, diagram) and technology (computerised machine) to perform engineering processes or produce texts in turn – functional literacy level.
Compare & take a position	1 in Math	Compare representations of given data (multi-modal texts) in order to present a quantitative argument – critical literacy level.	Assess/ Define & verify/ Confirm	8 in EP	Read and interpret multi—modal texts (e.g. specifications, manual, machine readings) to test or effect modifications in the engineering process – functional literacy level.
Convert	1 in Math	Convert the form of complex numbers so as to perform mathematical operations – functional literacy/numeracy level.	Convert	1 in EP	Produce a multi-modal text – set of instructions and operation sheet – functional literacy level.
Develop & use/ Develop & determine	2 in LO	Draft documents or acquire academic cognitive competence - functional literacy level.	Demarcate	1 in AET	Read and use signs to ensure safety in the work area -- functional literacy level.
Differentiate	1 in LO	Verb is used to demonstrate understanding of differences, e.g. interview behaviour. Literacy practice is incorporated into assessment tasks or activities – academic literacy.	Demonstrate/ Illustrate	2 in AET	Demonstrate safety practices or control systems using multi-modal texts -- functional literacy level.
Display	1 in LO	Verb is used to demonstrate technological skill (e.g. formulas in a spreadsheet) as well as knowledge of features of digital texts – functional literacy level.	Demonstrate/ Illustrate	4 in PEP	Present a report or demonstrate understanding of textual features or engineering concepts – functional literacy level.
Draft & update/ Prepare & type/ Complete & post (documents)	3 in LO	Draft documents as well as integrate technology (computer) into literacy practice - functional literacy level.	Design	1 in AET	Produce a multi-modal text – prototype design – functional literacy level.
Draw & determine/ Represent/ Draw/ Draw & solve/ Sketch	7 in Math	Apply functional numeracy practice – represent graphical information for analysis (produce a multi-modal text).	Draw/ Illustrate	1 in EP	Produce a multi-modal text – outline for manufacturing a product – while integrating technology (CAM) – functional literacy level.
Edit & proofread	1 in EFAL	Denotes corrective measures in writing practices – functional literacy level.	Ensure	6 in AET	Ensure safety in work practices when working in the vicinity of mechanical equipment. Assumption is that students will be engaging in texts relating to safety requirements and standards. There is no clear link in the outcome to literacy development.
Examine/ Identify/ Consider	3 in EFAL	Denotes reading and analysing multi-modal texts such as advertisements, newspaper or magazine columns and/or articles and other media texts – functional literacy level.	Ensure	9 in EP	Ensure safety in work practices and compliance with specifications. Assumption is that students will be engaging in texts relating to requirements and standards for the work task. There is no clear link in the outcome to literacy development.
Explain & distinguish/ Discuss	3 in Math	Explain concepts (probability models and events, data methods) to demonstrate understanding and prepare a quantitative argument – critical literacy/numeracy level.	Evaluate	2 in AET	Read and interpret multi—modal texts (e.g. prototype design) to test or effect modifications in the design – functional literacy level.

Learning Outcome Verb (Fundamental)	Frequency in Core Subject	Denoted Literacy Practice	Learning Outcome Verb	Frequency in Core Subject	Denoted Literacy Practice
Explain/ Explain & set/ Explain & post/ Describe/ Define/ Explain & identify	43 in LO	Explain and describe to demonstrate understanding and knowledge of concepts (e.g. exam writing techniques) and processes (e.g. grievance and complaints procedures in a workplace and voting process). Literacy practice is incorporated into assessment tasks or activities – academic literacy.	Examine/ Check	3 in AET	Detect design faults or conformity with expectations and specifications and report on them – functional literacy and behaviour.
Express (appreciate)	1 in EFAL	Express appreciation and enjoyment related to creative texts. Implies use of reading and writing practices – literacy behaviour.	Examine/ Check/ Inspect & diagnose/ Examine & measure	22 in EP	Read and interpret multi—modal texts (e.g. digital readings, manual, diagram) in order to produce a work-related activity or text in turn – functional literacy level..
Formulate	2 in EFAL	Formulate logical and coherent sentences – implies correct language usage in writing or speaking practices -functional literacy level.	Explain/ Define/ Discuss	13 in PEP	Explain engineering concepts through application of literacy practices such as discussion, written texts or graphical representations – academic literacy.
Find & formulate	1 in Math	Perform a mathematical operation – functional literacy/numeracy level.	/ Describe/ Describe and explain/ Identify and describe	20 in AET	Explain design concepts through application of literacy practices such as demonstration, written texts or sketches and drawings – academic literacy.
Identify	3 in Math	Verb is used to demonstrate understanding and knowledge. Literacy practices such as discussion, representation or writing are incorporated into assessment tasks or activities – academic literacy.	Explain/ Exercise thinking	4 in EP	Understanding of manufacturing concepts will be communicated either verbally through practical demonstration or in writing – academic literacy.
Identify/ List/ Suggest/ Indicate/ Identify & use	18 in LO	Verb is used to demonstrate understanding and knowledge of concepts (e.g. causes of stress) and processes (e.g. dealing with depression). Literacy practice is incorporated into assessment tasks or activities – academic literacy.	Fit	1 in EP	Fit machine tools to meet machine specifications to enable machining of the product. Implies students should be able to correctly set up the computer aided machine (CAM) and equipment for the cutting process. Assumption is that students will be engaging in digital texts and tasks to do so. There is no clear link in the outcome to literacy development.
Infer	1 in EFAL	Infer meaning in visual texts such as photographs, advertisements, cartoons, and illustrations etc. – functional literacy level.	Identify	7 in AET	Verb is used to demonstrate understanding and knowledge. Literacy practices such as discussion, presentation or writing are incorporated into assessment tasks or activities – academic literacy.
Interpret/ Interpret & communicate/ Interpret, understand & use	3 in Math	The use of this verb relates to demonstrate understanding through representations or written texts – academic literacy.	Identify/ Identify & report	5 in EP	'Identify' is used more as a naming function for selection or explanation purposes – academic literacy.
Investigate & explain	2 in EFAL	Verbs denote research and explanation of media communication concepts. Reading, speaking or writing practices are implied – academic literacy.	Identify/ Interpret/ Consider	8 in PEP	Verb is used to demonstrate understanding and knowledge. Literacy practices such as discussion, presentation or writing are incorporated into assessment tasks or activities – academic literacy.
Investigate/ Explore/ Explore & use	4 in LO	Verbs denote research and explanation of concepts (e.g. effects of traffic accidents or cases of Internet fraud). Reading, speaking or writing practices are implied – academic literacy.	Investigate	1 in PEP	Investigate the nature and roles of different types of models used in the engineering design process – assumption is that students will be doing research (reading) so as to discuss (verbally or in writing) – academic literacy.
Justify	1 in EFAL	Justify opinion with reference to a reading text – denotes reading and writing practices - academic literacy.	Lubricate	1 in EP	Lubrication is done in preparation to operate engineering machines - practical work task. There is no clear link in the outcome to literacy development.

Learning Outcome Verb (Fundamental)	Frequency in Core Subject	Denoted Literacy Practice	Learning Outcome Verb	Frequency in Core Subject	Denoted Literacy Practice
Listen	3 in EFAL	Verb denotes listening - one of the modalities of language which constitutes a literacy practice – functional literacy.	Perform/ Start & run/ Carry out/ Machine/ Cut	6 in EP	Perform engineering processes. There is no clear link in the outcome to literacy development.
Navigate	1 in EFAL	Verb signifies use, e.g. navigate the Internet to access texts – functional literacy.	Perform	3 in PEP	Verb denotes applying a literacy practice such as computer programming – functional literacy level.
Perform (calculations)/ Factorise/ Determine (calculate)/ Establish (determine)/ Find (determine)/ Calculate	9 in Math	Perform mathematical operations and functions – functional literacy/numeracy level.	Place	1 in EP	Place parts in order for assembly - practical work task. There is no clear link in the outcome to literacy development.
Plan, research & organise/ Plan & organise	2 in EFAL	Denotes reading and producing multi-modal texts, e.g. mind maps, written texts – functional literacy level.	Pre-clean/ Clean/ Clear	4 in EP	Verb is used to denote practical work tasks relating to cleaning of parts and clearing the work area. There is no clear link in the outcome to literacy development.
Practise/ Engage	2 in EFAL	Verb denotes speaking – one of the modalities of language which constitutes a literacy practice – functional literacy level.	Prepare/ Set/ Set up	9 in EP	Use a multi-modal text (e.g. digital readings, manual, diagram) and technology (CAM) to perform a learning or work task – functional literacy level.
Predict	2 in EFAL	Predict context and purpose of linguistic texts – spoken or written. This forms part of pre-listening and pre-reading activities – signifies concept recognition.	Present/ Present and demonstrate	2 in PEP	Present textual features of a given sketch, drawing or graph or technical report, either verbally or in writing – functional literacy level.
Predict	1 in Math	Signifies presentation of a solution to a data problem (formulating a quantitative argument) – functional numeracy inclusive of written texts.	Provide	2 in AET	Verb is used more in the sense of ensuring conformity to safety requirements and standards. Assumption is that students will be engaging in texts relating to safety requirements and standards. There is no clear link in the outcome to literacy development.
Present/ Prepare & present	3 in EFAL	Denotes speaking and writing practices – functional literacy level.	Read	1 in EP	Read and interpret multi-modal texts (drawing information) – functional literacy level.
Read (engage)	1 in EFAL	Verb denotes reading – one of the modalities of language which constitutes a literacy practice – functional literacy level.	Record	3 in EP	Produce a multi-modal text – record machine readings and component information – functional literacy level.
Reproduce	1 in EFAL	Denotes writing practices – reproduce reading texts such as proposals, articles or letter to the press – functional literacy level.	Return	1 in EP	Return tools - practical work task. There is no clear link in the outcome to literacy development.
Respond & answer/ Respond/ Provide/ Answer/ Recognise & respond	7 in EFAL	Provide responses either verbally or in an appropriate written format – functional literacy level.	Save	1 in EP	Save programme - practical work task. Although students will do so on a computer, but there is no clear link in the outcome to literacy development.
Review/ Reflect & improve/ Incorporate & improve/ Reflect	5 in EFAL	Review notes, reflect on performance or incorporate feedback. This forms part of post-listening, post-reading and -viewing and post-writing activities – concept recognition and critical literacy.	Scrutinise and memorise	1 in EP	Use of verb relates to memorising make up of component before disassembly - practical work and learning task. There is no clear link in the outcome to literacy development.
Review & indicate	1 in LO	Verb is used to indicate revision of the personal profile in the personal development plan. Literacy practice is incorporated into the practical assignment – academic literacy.	Select/ Include	2 in AET	Read and use multi-modal texts (e.g. prototype designs) to test conformity to specifications – functional literacy and behaviour.
Solve	1 in Math	Perform mathematical operations and functions to present a solution to a problem – functional literacy/numeracy level.	Select/ Choose	13 in EP	These verbs link to identification and naming of components and tools used in manufacturing processes – academic literacy.

Learning Outcome Verb (Fundamental)	Frequency in Core Subject	Denoted Literacy Practice	Learning Outcome Verb	Frequency in Core Subject	Denoted Literacy Practice
Summarise	2 in EFAL	Denotes reading and writing practices – functional literacy level.	Store	1 in EP	Store completed components - practical work task. There is no clear link in the outcome to literacy development.
Take notes	1 in EFAL	Denotes listening and writing practices – functional literacy level.	Structure and compile	2 in PEP	Produce a multi-modal text – technical report – functional literacy level.
Track & devise	1 in LO	Students perform a learning task – tracking progress. Literacy practice is incorporated into assessment tasks or activities – academic literacy.	Test	1 in AET	Read and use multi-modal texts (e.g. prototype designs) to test conformity to specifications – functional literacy and behaviour.
Understand	1 in EFAL	Denotes reading and analysing multi-modal texts such as advertisements, newspaper or magazine columns and/or articles and other media texts – functional literacy level.	Test & simulate	3 in EP	Read and use multi-modal texts (e.g. digital readings, manual, diagram) and technology to perform engineering processes – functional literacy level.
Use & improve/ Use/ Apply/ Identify and apply	7 in EFAL	Use and correctly apply a variety of language structures and grammar conventions in verbal and written texts – functional literacy level.	Tighten	1 in EP	Tighten to specified torque - practical work task. There is no clear link in the outcome to literacy development.
Use/ Use & solve & justify/ Use & determine or prove/ Use & calculate/ Use & predict	16 in Math	Use multi-modal texts to perform mathematical process and operations, e.g. solve problems - – functional literacy/numeracy level.	Understand and follow/ Communicate understanding	2 in EP	Understanding will be communicated either verbally (e.g. practical demonstration) or in writing – academic literacy
Use & understand/ Understand	3 in LO	The verb relates to using texts to demonstrate understanding and knowledge of concepts, e.g. protocols and precautionary measures when using social networks. Literacy practice is incorporated into assessment tasks or activities – academic literacy.	Use & construct/ Assimilate and record	2 in AET	Use a multi-modal text (e.g. diagram or digital test results) to perform a learning or work task - – functional literacy level.
Use/ Use & perform Word functions/ Use & perform spreadsheet functions/ Create & perform database functions	23 in LO	These verbs relate to using software applications to create digital texts and perform certain functions – functional literacy level.	Use	2 in EP	Use a multi-modal text (e.g. design and product specifications) to perform a learning or work task – functional literacy level.
View	1 in EFAL	Verb denotes reading texts other than written and constitutes a literacy practice – functional literacy level.	Use & construct/ Discuss & design/ Use or apply	6 in PEP	Use technology and multi-modal text to produce digital and other multi-modal texts in turn – functional literacy level.
Write	1 in EFAL	Verb denotes writing – one of the modalities of language which constitutes a literacy practice – functional literacy level.			

## C2. Analysis of denoted literacy practice in learning outcome statements

The table below reflects a comparative analysis of the verbs that were commonly used in both the fundamental and core subjects. In each instance, the frequency was recorded and the literacy meaning it denotes. The cells shaded indicate the three (3) groups of verbs with the highest frequency of use in the learning outcome statements of both the fundamental and core subjects. In the discussion in 3.5.2 a comparison was drawn between these verbs and the literacy practices denoted.

**Table C2** Analysis of denoted literacy practice in learning outcome statements

	Verb (Fundamental)	Frequency	Literacy Meaning	Verb (Core)	Frequency	Literacy Meaning
1.	Analyse	1	Denotes reading and interpreting information in multi-modal texts. Proficiency/capability in reading and information processing is developed.	Analyse/ Identify and analyse/ Analyse and report	3	Check for faults or non-conformity and report on these orally or in writing. More work task-specific analysis.
2.	Apply & use/ Apply & state / Apply & solve/ Apply & justify	8	Functional literacy and numeracy practices are developed and applied.	Apply/ Join/ Attach	11	7 instances relate to implied literacy practice to perform engineering-related tasks. Functional literacy and numeracy practices are developed and applied in 4 instances.
3.	Convert	1	Relates to performing mathematical operations.	Convert	1	Relates to producing a multi-modal text.
4.	Draw & determine/ Represent/ Draw/ Draw & solve/ Sketch	7	Relates to a functional numeracy practice – representing graphical information for analysis	Draw/ Illustrate	1	Draw an outline for a product manufacturing process. Task is more work-specific and workplace contextualised.
5.	Examine/ Identify/ Consider	3	Denotes reading and interpreting (analysing) information in multi-modal texts. Proficiency/capability in reading and information processing is developed.	Examine/ Check/ Inspect & diagnose/ Examine & measure	25	Instances relate to implied literacy practice to perform engineering-related tasks to report on non-conformity in design. Task is more work-specific and literacy is workplace contextualised.
6.	Explain & distinguish/ Discuss/ Explain & set/ Explain & post/ Describe/ Define/ Explain & identify	46	Denotes use of functional literacy practices (speaking, writing, representations) to demonstrate knowledge and understanding.	Explain/ Define/ Discuss/ Describe/ Describe and explain/ Identify and describe/ / Exercise thinking	37	Denotes use of functional literacy practices (speaking, writing, representations) to demonstrate knowledge and understanding.
7.	Identify/ List/ Suggest/ Indicate/ Identify & use	21	Denotes use of functional literacy practices (speaking, writing and presenting) to demonstrate knowledge and understanding.	Identify/ Identify & report/ Interpret/ Consider	20	Denotes use of functional literacy practices (speaking, writing and presenting) to demonstrate knowledge and understanding in 15 instances. Denotes identification and naming function in which literacy practice is implied in 5 instances.
8.	Investigate & explain/ Explore/ Explore & use	6	Denotes use of functional literacy practices (speaking, reading and writing) to conduct research and present findings.	Investigate	1	Denotes use of functional literacy practices (speaking, reading and writing) to conduct research and present findings.

	Verb (Fundamental)	Frequency	Literacy Meaning	Verb (Core)	Frequency	Literacy Meaning
9.	Perform (calculations)/ Factorise/ Determine (calculate)/ Establish (determine)/ Find (determine)/ Calculate	9	Verb denotes application of literacy and numeracy practices in performing mathematical operations and functions.	Perform	3	Verb denotes applying a digital literacy practice such as computer programming.
10.	Present/ Prepare & present	3	Denotes use of functional literacy practices (speaking, reading and writing) to present knowledge and understanding.	Present/ Present and demonstrate	2	Denotes use of functional literacy practices (speaking, reading and writing) to present knowledge and understanding.
11.	Read	1	Denotes reading as functional language practice.	Read	1	Denotes reading as functional language practice.
12.	Understand	1	Denotes reading and interpreting (analysing) information in multi-modal texts. Proficiency/capability in reading and information processing is developed.	Understand and follow/ Communicate understanding	2	Verb is used more in the sense of communicating understanding.
13.	Use & improve/ Use/ Apply/ Identify and apply/ Use & solve & justify/ Use & determine or prove/ Use & calculate/ Use & predict/ Use & understand/ Use & perform Word functions/ Use & perform spreadsheet functions	42	Denotes use of multi-modal texts to produce such texts in turn, to perform literacy tasks or to demonstrate understanding. Functional literacy (and numeracy) capabilities are developed.	Use/ Use & construct/ Discuss & design/ Use or apply	10	Denotes use of multi-modal texts to produce such texts in turn, to perform engineering-related tasks or to demonstrate understanding. Functional literacy (and numeracy) capabilities are developed.