ASSESSMENT FOR THE CHANGING NATURE OF WORK

Helen Bound
Arthur Chia
Annie Karmel

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institute for adult learning singapore

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Address
1 Kay Siang Road
Tower Block Level 6
Singapore 248922
research@ial.edu.sg

For more information, see http://www.ial.edu.sg/

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Executive Summary

This report seeks to expand the current understanding and ways of thinking about assessment, work and learning. Unlike current approaches to assessment that tend to separate learning and assessment, we suggest that good assessment should lead to greater professionalisation and understanding of work, enhance one's capacity to learn beyond the immediate course/training, and enhance engaged learning. Hence, how assessment is integrated and intentionally designed into the curriculum and learning system requires an in-depth study and even review.

In this report, we examine assessment in relation to the changing nature of work and policy thrusts such as "SkillsFuture", analyse six cases relating to different professions and learning contexts, highlight the challenges of leveraging assessment to enable learning and work, and suggest recommendations for assessment practice and policy making.

We adopt an interdisciplinary (sociocultural and pedagogical) approach, focusing on context, practice and design in carrying out the above. Through fieldwork, including interviews, focus group discussions, observations and document analysis, we study how assessment has been carried out (i.e. designed and implemented) in various learning sites including the classroom, laboratory, centralised training kitchen and training simulator.

Our findings show that factors such as the nature of work and the requirements of professional practice and/or vocation, as well as possibilities (for performance, responsiveness to change and adoption of assessment "best practices"), can constitute assessment, and not just assessment strategies and principles, in and/or of themselves. The findings also present a complex and dynamic picture of learning and assessment, including the mixing of summative-formative assessment, learning as becoming, and embodied learning. All these observations are factored into what we term "six dimensions of assessment" that identify key features and values of assessment as well as their relationships. These dimensions are: "alignment", "authenticity", "judgement", "feedback", "holism" and "future-orientedness". The "six dimensions of assessment" challenge "traditional" perspectives of learning that include transfer of knowledge and assessment as merely the testing of knowledge, and they offer suggestions on how to think about and design assessment practices for work and learning.

The recommendations discussed in this report comprise "small-scale" suggestions on possible pedagogical interventions to specific challenges, e.g. the need for a shift in focus from what teachers do to what students learn, from what inputs are made into the education/learning process to what outcomes or effects come out of the process, and from what has been learned to what is needed to support or sustain continual learning. It is also "bigger picture" in highlighting the longer-term perspectival changes and broader structural challenges to be overcome.

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1. Introduction

It is no surprise that the nature of work is changing; it has always been changing. What is becoming more of a concern is the adequacy of educational legacies in helping to prepare people for the changing nature of work. Assessment and how we understand and use it is an important aspect of this new look at education in relation to work. This report seeks to expand the current understanding and ways of thinking about assessment, work, and learning. Current approaches to assessment tend to separate learning and assessment; we suggest that learning and assessment are integrated and entwined. When designed with such integration, assessment has the potential to lead to greater professionalisation and understanding of work, improve one's capacity to learn beyond the immediate course/training, and enhance engaged learning.

Our research addresses the following question:

How can assessment design and practices be shaped and/or enhanced to meet changing policy directions and workforce development needs?

This question is addressed through the following sub-research questions:

1. How do different contexts (e.g. different institutional policy contexts or their purposes, including credentialing, discourses and practices) mediate assessment practices and decisions?

2. What are the current experiences of and challenges in assessment for learners, adult educators (AEs), providers and employers?

3. What features enable and/or hinder establishments and practitioners in adopting assessment practices for the changing nature of work?

In this report, we document our analysis of the six cases we looked into, as listed below:

- workplace learning facilitators
- firefighting: rota commanders
- cooks: menu-change training
- resident doctors
- aircraft engineers
- IT network engineers

The rationale for the selection of the cases is in the methodology section of this report, and the case reports can be found on the IAL website. Analysing across the six cases enables us to identify common themes across the diverse learning and assessment practices evident in them. This analysis resulted in us developing the "six dimensions of assessment" that identify key features and values of assessment and their relationships. These dimensions are alignment, authenticity, judgement, feedback, holism and future-orientedness, and will be discussed in later chapters.

The remainder of the introductory chapter covers the rationale for this research project on assessment, explains the methodology used in the project, and provides definitions for some key terminology used in the report.

1.1 Why a research project on assessment in Singapore?

Our understanding of learning and of its relationship with assessment constantly evolve, and this is one reason for a project on assessment and the changing nature of work. However, there are other, more critical reasons for this project. They include developments in policy and, in particular, SkillsFuture; the changing nature of work as indicated in our project title; and the search by practitioners for alternative approaches to assessment.

1.1.1 Strategic policy changes

From a policy perspective, Singapore's SkillsFuture initiative emphasises the value and importance of building deep and future-relevant skills, and of creating a culture of lifelong learning where individuals "take ownership for acquiring new skills and deepening skill sets throughout their careers" (Workforce Development Agency, 2014, slide 4). A component of this is a new strategic policy direction encouraging a shift from heavy reliance on classroom learning towards the inclusion of workplace-based and work-based learning. The multiple aspects of SkillsFuture include extending enhancements to the internship curriculum to half of all ITE courses and two-thirds of all polytechnic courses over 2015/2016, and for all ITE and polytechnic courses by 2020. This includes establishing defined learning outcomes and structured activities during the internship which support these outcomes. Universities such as UniSIM and SIT are specifically mentioned in this new emphasis on improved internships, in relation to their pioneering of the applied-degree pathway. In addition the SkillsFuture Earn and Learn work-study programme (ELP) is intended to provide graduates with more opportunities to build on the skills and knowledge they acquired in school after graduation, and to better support their transition into the workforce. The emphasis on the relationship between work activity and learning, and classroom learning, will require in some instances fundamental changes to the way people think about the design and intent of assessment and learning. This project on assessment practices for the changing nature of work is thus timely.

1.1.2 The changing nature of work

SkillsFuture is in part driven by changes in work and in the labour market that occurred in response to global shifts in capital and investment around the globe. Prime Minister Lee Hsien Loong announced in October 2015 that the Committee on the Future Economy will "study how to create opportunities and move faster towards higher skills, innovation and productivity" (*Straits Times* 18 October 2015, B1). The increased sense of urgency to move to "higher skills, innovation and productivity" is but one of many pressures faced by both employers and workers. The hollowing out of the middle (Brown Lauder & Ashton, 2011), the growth of non-permanent work (Bound, Sadik & Karmel, 2015) [1], and technological change can be added to the list. Multiple career changes (of a minor and/or major nature) and the subsequent changes and requirements for learning and developing new skills, as well as adapting to changes in management and culture, are also part of the landscape of work. These issues are seemingly far removed from assessment, but in fact, assessment can be one lever to prepare learners to be "work-ready" now and for their unknown futures.

[1] Please see the following link to the report:

Bound et al. (2015) https://www.ial.edu.sg/content/dam/projects/tms/ial/Research-publications/Reports/Developing%20non-permanent%20workers%20in%20Singapore.pdf

1.1.3 Practitioners in the CET sector and previous research

CET practitioners' response to the idea of doing a project on assessment practices is that "it is long overdue". Practitioners seem to be looking for more innovative approaches to assessment, and ways to integrate assessment with the learning process and the realities of work, and as part of developing learners holistically (see e.g. Bound & Lin, 2011a, 2011b; Stack & Bound, 2012)[2]. In addition practitioners from a range of professions have expressed a need for more than the development of technical skills alone; what they seek are those who not only have an understanding of the industry but know how to "be", how to act and how to relate as part of a given profession (see e.g. Bound, Rushbrook & Sivanlingam, 2013; Bound et al., 2015;)[3]. The desire for assessment that contributes to developing people holistically, and to learners becoming a particular professional, not only requires innovative approaches to assessment but also raises deep questions about learning and assessment and their relationship with each other. These issues will be teased out in the remainder of the report.

1.2 Methodology

In order to answer the research questions, we undertook six qualitative case studies using a semi-ethnographic approach to understand contexts, experiences, and enablers/disablers. The in-depth approach that we have used, rather than surveying a large number of cases, means that we engage in an intensive study of a "fragment" (of assessment practices) to gain a perspective of the whole. How that is done, and the analytical approaches to the study of this fragment, whether as representative of the whole, Weberian "ideal types" construction, or otherwise, are subjects of continuous debates in the human and social sciences.

In considering our data collection of observations and curriculum documents for analysis, as well as semi-structured interviews and small focus groups, we used a practice-based lens. A practice-based lens enables us to gather, understand, and interpret the data in its complexity, and to appreciate the interrelationships and connections between the messy "lived realities" and complexities in the way assessment is used, understood, and valued rather than in its idealised forms. A practice-based approach allowed us to adopt an analytical framing of assessment as "practice", which situates assessment in its context comprising institutional setting, professional domain and knowledge field. See section 2.2.1 in Chapter 2 for a fuller explanation of the practice-based approach.

Our research questions sit under an overarching question of:

> How can assessment design and practices be shaped and/or enhanced to meet changing policy directions and workforce development needs?

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[2] Please see the following links to the reports:

Stack & Bound (2012) https://www.ial.edu.sg/content/dam/projects/tms/ial/Research-publications/Reports/Tools%20for%20Learning%20Design%20Research%20Report.pdf

Bound & Lin (2011) https://www.ial.edu.sg/content/dam/projects/tms/ial/Research-publications/Reports/WSQ%20Workplace%20Learning%20and%20Assessment%20Stage%20I.pdf

[3] Please see the following link to the report:

Bound et al. (2013) https://www.ial.edu.sg/content/dam/projects/tms/ial/Research-publications/Reports/The%20Journey%20from%20Novice%20to%20Expert.pdf

This question is addressed through the following sub-research questions:

- How do different contexts (e.g. different institutional policy contexts and their purposes, including credentialing, discourses and practices) mediate assessment practices and decisions?
- What are the current experiences of and challenges in assessment for learners, AEs, providers, and employers?
- What factors enable and/or hinder establishments and practitioners in adopting leading practices in assessment?

We analysed the data for each case and across the cases and wrote this up into a total of seven reports: six individual case study reports and this summative report, which is the cross-case analysis of the six case studies. The cross-case analysis draws on the findings from across the cases to discuss common/shared themes, as well as the implications these may have for developing assessment practices for the changing nature of work.

The six cases in this study show:

- a variety of purposes, forms and meanings of assessment;
- the blurred boundaries between summative and formative assessment;
- the "assessment dilemmas" that ensue from multiple needs of business, learning/training and employee welfare, and also from different expectations between industry, institution and learners;
- different modes of learning across different industries, and professional and disciplinary domains, where learning is enacted/enabled through:
    - practice, drills and experience (rota commanders);
    - doing, interacting and experimenting (aircraft engineers);
    - inquiry and testing (IT network engineers);
    - the embodiedness of know-how in professional cooking which highlights, for example, the importance of "taste", expressed in and through the cook's work.

The report for each case was written up and sent back to the "owners" of the case (the organisation that kindly gave us access to the documents, learners and staff) for verification and input. All owners responded with suggestions and began the process of thinking about potential changes in their approaches to assessment.

1.2.1 The six cases

In selecting the cases, we looked for assessment approaches that met the following criteria:

- diversity of current assessment practices;
- different types of providers;
- assessment activities including classroom, workplace and/or e-learning settings;
- different types of accreditation frameworks;
- identified by providers as good assessment practices;
- containing workplace learning components and/or other blended approaches;
- willingness to participate in project and timing of the module (to fit our commitments).

As a result, the selected cases are quite varied. They are: the certification of workplace learning facilitators, the introduction of promotional menu items at a food and beverage outlet, the certification of rota commanders, a residency programme for doctors, an undergraduate degree programme in aircraft engineering and a certification in IT network solutioning. The commonalities among these cases are that they all involve both formal (structured) and informal assessment practices; they are applied,

in that they are preparing people for the workforce; and the programmes are strongly influenced and validated by industry standards. This research, then, focuses on assessment practices that leverage the opportunities and affordances of work and industry expectations in order to help prepare people for their futures.

Table 1.1 The six case studies

Case	Certified Accrediting body	Duration	Assessment activities	What each case highlights for assessment
Workplace learning facilitator	Yes IAL	10 months	Formative assessment from coaches Summative assessment through learning journal, enterprise report, and final assessment interview 70 per cent attendance required	Learning as "becoming" through the achievement of a set of competencies which confer recognition as a professional in workplace learning.
Cooks	No N.A.	4 weeks	Live cooking demonstration on how to prepare new menu items Written feedback from chef Observation by outlet supervisors after launch of new menu items	Learning of "aesthetic" and "taste" is an integrated and holistic process. The knowledge and skills required cannot be boiled down easily into discrete tasks. And learning involves development of learners' judgement for his/her own work.
Rota commander	Yes WDA	7 months	Simulated exercises Written theory tests Presentations	The learning of "leadership" is about the internalisation of the ethos and values of the profession. Learning is an embodied process of doing, practice, and experience.
Resident doctor	Yes Singapore Medical Council	3 years	360-degree feedback Monthly evaluations Mini-CEX	Learners have different and sometimes conflicting roles to fulfil as a practicing doctor and

Case	Certified Accrediting body	Duration	Assessment activities	What each case highlights for assessment
	ACGME-1			student. Any "new" (formative) assessment tasks compete with other priorities and needs.
Aircraft engineer	Yes CAAS WDA	3 years	Individual Final Year Project Summative assessment through learning journal, FYP report final presentation	Students' Final Year Project requires application of concepts and skills, and must have real work utility and suggest complexity. It expands the notion of "authenticity" beyond just "real work".
IT network engineers	Yes The provider (In addition, WSQ assessment is optional)	1 week	Observation of basic skills by facilitator Formative assessment of problem-solving exercises Written test involving a range of network problems to identify	Learning and assessment focus on "ways of being" an IT network engineer that include developing analytical thinking for problem solving, developing understanding of whole systems – global, national, organisational and in-between.

1.2.2 The participants and the data

A total of 24 learners, 19 facilitators/assessors/curriculum designers and 6 employers were interviewed. Observations varied in length according to what was being observed, but many of the observations took place over a full day (*n* = 15). A total of **105 data points**, illustrated in Figure 1.1, were identified from documents analysed, which were varied and in some cases quite extensive (*n* = 41). Table 1.2 sets out the details of the data collected for each case, which included interviews, focus groups, observations, and analysis of curriculum documentation.

Figure 1.1 Types of data collected

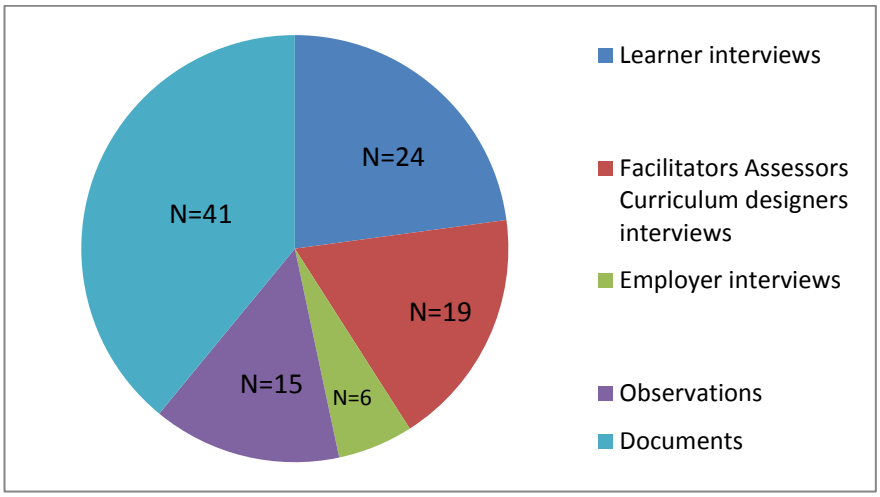

Table 1.2 Case data

Case	Interviews				Observations	Documents
	Learner	Facilitator/ assessor	Curriculum designer	Employer		
Workplace learning facilitators	2	4	1	–	4: meeting of designers; levers of change workshop; levers of change workshop 2; certified workplace learning workshop	3 design documents: curriculum; learning journal; report sample. 11 learner artefacts: 9 learning journals; 1 reflective journal; 1 enterprise report
Cooks	1 + 1 FG of 6 (*n* = 7)	2	1		2: 1 day at central kitchens; 1 day in an outlet	Company assessment documents
Rota commanders	2 FG of 4 same members	3	1	1	3: flashover training; ex. hotblaze; ex.	5: 2 assessment documents; 1

Case	Interviews				Observations	Documents
	Learner	Facilitator/ assessor	Curriculum designer	Employer		
	(*n* = 8)				high-rise	curriculum (high-rise fire); 1 CDA training directory; 1 Singapore Quality Award 2015 Application Report
Resident doctors	–	1 + 2 course coordinators		1 Training hospital	1: assessor training workshop	6: 1 curriculum (cardiology); 3 assessment documents; 1 feedback report; 1 monthly evaluation report
Aircraft engineers	3	1		-	4 days 2 days final year projects 2 days WSQ unit	4: 1 Programme outline; 1 WSQ module document; 1 final-year project module guidelines; 1 learning journal guidelines. 1 set of student's assessment submission: project write-up; project presentation slides; project documentation
IT network engineers	4	1	2 (Facilitator/ assessor was also involved in design)	3 (Reporting officers of learners from the 1 company)	1 day of the 5 day course	Learner guide and workbook

Case	Interviews				Observations	Documents
	Learner	Facilitator/ assessor	Curriculum designer	Employer		
Total	24	19		6	15	41

Figure 1.2 illustrates the varied qualification levels of the different types of participants.

1.2.3 Data analysis

Interviews and focus group discussions were recorded and transcribed. The researchers read and reflected on these as the transcribing was completed. The transcripts, documents and field notes from the observations were imported into NVIVO (software to assist with organising and analysing qualitative data). This data was then coded thematically using a process of selecting one case (cooks/F&B) for the initial development of the coding tree, which involved all three researchers coding interview transcripts and observation notes of this case. The team met and used Kappa coefficient score from NVIVO to flag out and focus on different interpretations of the codes and data. The coding tree was refined further and more detailed definitions of codes developed. The refined coding tree was then used to recode the F&B case, followed by a research team meeting to compare again for further refinements before coding the remaining cases. For inter-coder variability, checks on each case were assigned to a researcher who took charge of coding and writing that case. In addition, the other two researchers analysed one or two transcripts/data sources from a case that was not their own. Researchers met every fortnight to check interpretations and any emerging issues of consistency.

1.2.4 Stakeholder reporting

Within the project, there are two major forms of stakeholder engagement. One is the reference group and the other is the engagement with the case “owner”. For the latter, the case write-up was emailed to them for corrections and comments. All case owners responded with corrections and comments on their learning points. The research team made adjustments to the report accordingly and it was again sent back for final verification and endorsement.

Examples of comments from case owners include:

- Addressing feedback which was predominantly corrective. We will take heed and re-evaluate and opt for more explanatory approach.
- Mostly I am intrigued to have more fleshed out pointers on how sustainable assessment and its potential can be actualised in a local CET context where learners are very acculturated to competency-based assessment and expect the institution to define the criteria, standards and sources of evidence “admissible” for assessment rather than to be involved in co-developing and/or negotiating the interpretation with the institution?
- I like the tenet of sustainable assessment and its relation to the Boot Camp. Brings into focus the multi-faceted pathways and outcomes of a very complex programme in my opinion.
- I think the report will be useful to L&D professionals in different organizations since many seem to be stuck in the ‘status quo’ – i.e. the 1990s style of multiple choice questions is what they expect but they know it’s not working. So it should be a breath of fresh air to them …. It will also be useful to progressive training organizations (it will give them something to aim for) …. Hopefully it will “open the minds” of L&D professionals so that they become more strategic about their role and they will push training organizations to give them better course/assessment therefore enhancing the ecosystem

The other major stakeholder engagement process employed in the project was the use of a stakeholder reference group. A reference-group meeting was held at the beginning of the project with participants from the WDA's[4] TPDD, IAL's LPPD team, representatives from Singapore's IHL (mainly curriculum, educational and professional development) and CET providers. The purpose of this session was to engage stakeholders who have the power to make a difference, through sharing the project, and to gain suggestions on the project. This first session was attended by one of the project's Visiting Fellows, Professor David Boud. The second and final reference group session was held in September, the final month of the project. A much-expanded group of stakeholders, now including adult educators and learners, met to discuss the draft report (circulated before the meeting) and its implications for them and for the sector, and to make recommendations. Following this input, the researchers finalised the report to include the suggestions and address the issues raised.

1.3 Terminology and definitions

1.3.1 What is assessment?

Traditionally, assessment is considered from psychometric perspectives and thought of in terms of measurement of learning and as being objective. We take a different stance, one in keeping with our focus on the changing nature of work and the complex realities of assessment for, in and through work. Assessment is a tool to ensure required standards are met. This in fact is its primary purpose and one consistent with the Organisation for Economic Co-oporation and Development (OECD) focus on assessing standards to maintain international competitiveness, for example "on the use of standards and conformity assessment (CA) systems as regulatory tools with implications for international trade and policy coordination" (OECD, 2005, p. 4)[5]. However, it is not the only possible purpose of assessment. We define assessment as a process of making judgements; assessment is done with learners, not to or on learners. In making this point, we recognise learning not as a precise science, but as a process with intentional goals. Judgements are made over time from multiple sources based on multiple forms of evidence. Assessment draws on a diverse and multifaceted range of activities, systems and actors working within and across multiple contexts, which contribute to learners' constant process of 'becoming' – a process that never ends. Be it summative, formative or sustainable, assessment signals to learners what is valued, and it directs learners' attention and time to specific activities, concepts, values and principles that constitute "practice". In this way it can be seen as a core learning enabler or disabler, depending on how the assessment is designed, delivered and experienced.

1.3.2 Summative assessment

Summative assessment, sometimes referred to as assessment of learning, is what most people think of when they say "assessment". This is no doubt because the purpose of summative assessment is to certify achievement or progress in learning. It is typically conducted at the end of a course or a programme (Earl, 2003). Summative assessment has a long history of being "what counts" in gaining a qualification or some kind of certification.

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[4] In 2016, the Workforce Development Agency (WDA) was reconstituted into two new statutory boards: Skillsfuture Singapore (SSG), under the Ministry of Education, "to drive and coordinate the implementation of SkillsFuture", and Workforce Singapore (WSG), focusing on "jobs and ensuring enterprises can become manpower-lean while remaining competitive", under the Ministry of Manpower. For further information, please see: http://www.mom.gov.sg/newsroom/press-releases/2016/0112-new-statutory-boards-to-sharpen-focus-on-skills-and-employment

[5] Please see the following link for the report: https://www.oecd.org/trade/ntm/36223999.pdf

1.3.3 Formative assessment

Formative assessment, or assessment *for* learning, focuses on participants' learning, helping them to know how to improve (Gardner, 2012). Participants need continuous information from a variety of sources about their learning; information that informs what they are succeeding at and where they should put their efforts to improve, and strategies for moving forward (Berry, 2008). Assessment for learning does not necessarily include grading, assigning marks or noting the learner as competent or not yet competent. Feedback is a critical aspect of assessment for learning. The focus in more recent work on feedback is on "the contribution of others to learning through assessment, and repositioning the notion of feedback not as an act of information giving to students, but as a co-productive process in which both students and others have key roles to play" (Boud & Soler, 2016, p. 403). Students thus need to be able to give and receive feedback, and be given opportunities to do so. Feedback is after all "a process whereby learners obtain information about their work in order to appreciate the similarities and differences between the appropriate standards for any given work, and the qualities of the work itself, in order to generate improved work" (Boud & Molloy, 2013, p. 205).

1.3.4 Sustainable assessment

Sustainable assessment equips learners and prepares them for what might be required in the future, after graduation. Sustainable assessment takes a longer-term perspective, emphasising "lifelong learning" including "habits of mind", "metacognitive skills" and so on (Beck, Skinner & Schwabrow, 2013, p. 326). It aims to "equip students to learn beyond the academy once the infrastructure of teachers, courses, and formal assessment is no longer available" (Boud & Falchikov, 2006, p. 399 in ibid). In essence, sustainable assessment is learner-centric and focuses on the development of long-term learning capabilities. Practices such as peer assessment can be designed to enable sustainable assessment goals. Sustainable assessment involves "the capacity to evaluate evidence, appraise situations and circumstances astutely, to draw sound conclusions and act in accordance with this analysis" (Boud & Soler, 2016, p. 19). Key elements of developing informed judgement from the perspective of the students include: (1) identifying oneself as an active learner; (2) identifying one's own level of knowledge and the gaps in this; (3) practising testing and judging; (4) developing these skills over time; and (5) embodying reflexivity and commitment. Sustainable assessment demands that learners make conscious comparisons between self-assessments and assessments by teachers, peers and other stakeholders, and that responsibility for the assessment process must gradually shift from the teacher to the students, because, after graduation, people themselves need to drive their own learning (Boud & Soler, 2016).

1.4 Report structure

The following chapter (Chapter 2) reviews the literature relevant to our research questions. This is followed by a chapter reporting on the analysis of documents pertaining to assessment and curriculum units in ACTA and DACE. The value of this chapter is that these qualifications are undertaken by many in the CET sector, thus what is taught about assessment in these units sets the scene for current thinking and practices in the sector. We of course acknowledge that interpretation and practice varies extensively. This chapter is followed by another on assessment practices in the six cases, and by a findings/discussion chapter entitled "Shifts in thinking about assessment". The final chapter, "Recommendations", concludes the report.

2. The Contexts and Experience of Assessment: What We Know from the Literature

The importance of assessment in learning is well established in the literature; Knight (1995) for example, states that "*Assessment is a moral activity. What we choose to assess and how shows quite starkly what we value*" (p.13).

Assessment has multiple, sometimes seemingly conflicting purposes; the primary purposes are assessment for learning, and for credentialing. As Tigelaar & van der Vleuten (2014) note, assessment can be:

- a selection tool for admission to education, training programmes and jobs;
- a monitor and guide to learners' progress through a programme;
- a credentialing requirement for licencing;
- a qualification for promotion;
- a monitor on the effectiveness of education and training programmes; and
- evidence of programme quality.

These are all formal applications of assessment. Yet assessment is more than a process of ensuring that learners meet required standards; assessment at the same time can contribute to learners' (constant process of) "becoming", where assessment and learning are entwined.

Our research questions involve investigating how context mediates assessment practices; the experiences of learners, adult educators, providers and employers; and what might enable the adoption of leading assessment practices for the changing nature of work. With that in mind, this review of the literature considers what the changing nature of work means for learning and assessment, what we mean by "practices", unpacking practice-based approaches and the shift from a focus on psychometric approaches. We then address the issue of stakeholder engagement, followed by the making of assessment judgements and finally what constitutes leading assessment practices.

2.1 The changing nature of work: what does it means for learning and assessment?

In this section we briefly analyse some aspects of change and what they mean for learning and assessment. We link assessment to and with learning, as will be explained in further detail in a later section. For the purposes of this section, we recognise that what is assessed is what is valued. So, here we explore what authors are saying about what we need to learn for the future and for the changing nature of work[6], and what part assessment has to play.

[6] For the purposes of this report we take our cue from Winch (2013) to define "work" as activity that is remunerated. We acknowledge that non-remunerated activities such as child-rearing, the reproduction of labour power, community contributions and so on can also be considered as "work", but these are not within our scope.

Birenbaum (1996), some twenty years ago, identified aspects of the future learner in the light of change:

> What characterizes the era following the technological revolution … is pluralism and continual dynamic changes. As information is no longer considered finite and static but rather infinite and dynamic, the well-functioning person is likely to have to acquire new knowledge independently and use it to solve new unforeseen problems. Hence successful functioning in this era demands an adaptable, thinking, autonomous person, who is a self-regulated learner, capable of communicating and cooperating with others. The specific competences required of such a person include a) cognitive competences such as problem solving, critical thinking, formulating questions, searching for relevant information, making informed judgments, efficient use of information, conducting observations, investigations, inventing and creating new things, analyzing data, presenting data communicatively, oral and written expression; b) meta-cognitive competencies such as self-refection, or self-evaluation; c) social competencies such as leading discussion and conversations, persuading, cooperating, working in groups etc., and d) affective dispositions … for instance, perseverance, internal motivation, initiative, responsibility, self-efficacy, independence, flexibility or coping with frustrating situations. The need to develop these competencies expands the scope of education and this creates a challenging enterprise for educators. (p. 4)

It takes little to realise that this long shopping list of competencies does not apply to every job or every type of work, or even to some occupations. However, what Birenbau's list does highlight is that technical competencies are not in the foreground, rather we can assume that the types of competencies listed here are embedded in technical competencies. To state the obvious, technical competencies are also constantly changing, highlighting the need for well-developed "learning to learn" capabilities. With this and Birenbau's list of competencies above in mind, it is not surprising that many authors highlight in one way or another the need for an integrated holistic approach to teaching and learning (see, for example, Barrie, 2007; Bound et al., 2015; Higgs, Barnett, Billett, Hutchings & Trede, 2012; Reid, Abrandt Dahlgren, Dahlgren & Petocz, 2011). However, Barrie suggests that teachers vary in their understanding of these generic skills and qualities, depending on the nature of the learning outcomes, ranging from "atomistic, low-level technical and personal skills, to holistic interwoven abilities and aptitudes for learning" (2007, p. 440).

With this generic picture in mind, it is worth exploring a little further the nature of some of the major mediators of changes in work and what they might mean for the capabilities for today's workforce, while bearing in mind the need for a nuanced understanding of change. In the following paragraphs we consider different forms of production, technological change and the growth of non-permanent work, and their implications for assessment.

2.1.1 Forms of production

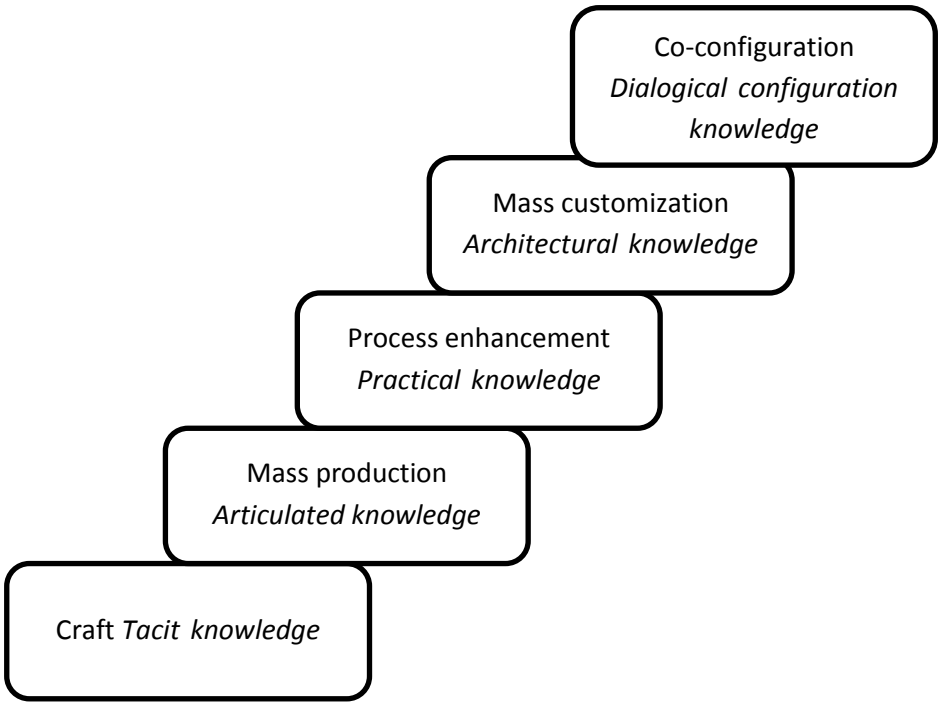
In terms of changes in forms of production, Victor and Boynton (1998) identify five historical and current types of work: craft, mass production, process enhancement, mass customisation and co-configuration. Engeström (2004) associates different kinds of knowledge with the different kinds of work (see Figure 2.1). For example:

> At present, the most demanding and promising developments are associated with the emergence of co-configuration work. A critical prerequisite of co-configuration is the creation of customer-intelligent products or services which adapt to the changing needs of the user (Engeström, 2004, p. 2).

All of these forms of production coexist today. Engeström identifies different kinds of knowledge relevant to different forms of production. Categorisation such as this brings into question claims such as that the tendency towards “knowledge-work and people centeredness, has a focus on theoretical knowledge, creativity and use of analytical and social skills” (Frenkel, Korczynski, Donoghue & Shire, 1995). In the very broadest sense this may be true, but a closer look suggests that such a claim does not hold across the board. In their skills utilisation survey of 2 293 Singaporean workers, Sung, Ramos, Loke & Ng (2011) found that only one in four jobs in logistics and transportation, and in the generic manufacturing industries, contain frequent or ongoing learning. These authors also note that in some industries, the figures are very high, for example, in the community and social services, and healthcare industries, frequent or ongoing learning applies to 66.2 per cent of jobs; in the marine industry, 53.9 per cent; aerospace and precision engineering industry, 50.0 per cent, and so on (p. iii). Sung et al. (2011) also found that different generic skills may create different impact in different jobs. Some generic skills, e.g. paying attention to details, dealing with people and working with a team of people, are regarded as “very important” skills in over 70 per cent of jobs in Singapore, while other generic skills, e.g. making speeches, delivering presentations and writing long documents are used by less than 20 per cent of jobs. Generic skills however, such as teamwork skills, planning skills and especially problem-solving skills, are utilised by most industries (p.iv).

A question in relation to assessment is whether or not the assessment reflects the types of combination and complexity of skills required in different forms of production. Or, is assessment practiced atomistically, focusing on individual skills divorced from the reality of the work? Additionally, does assessment position learners to move to other forms of production/work?

Figure 2.1 Historical forms of production from Engeström (2004, p. 2)



2.1.2 Non-permanent work

The growth of non-permanent work is a global phenomenon that is set to intensify in an environment characterised by shorter business cycles and the outsourcing of jobs (Brown et al. 2011; Ross, 2008). Traditional "smokestack" manufacturing and long-cycle production industries have in many advanced economies been usurped or are being usurped by knowledge and service-sector industries working on shorter-term production or turnaround cycles, demanding a core of ongoing workers and a flexible, temporary periphery, depending on the often rapidly shifting demand for the enterprise's "niche" or customised products and markets.

The diverse nature of non-permanent work involves shifting between different identity roles, clients and languages. This can create a juggling act of competing contracts, demands and expectations across a variety of contexts, in which understanding the norms of various environments becomes valuable. This needs to be done while appearing to adapt to each client's needs and being able to offer knowledge only in contexts where it is valued (Fenwick, 2008). In this sense, one needs to *be* a shape-shifter and a skilled time manager, while presenting a coherent "professional self" for the particular client at hand (Bound, Rushbrook, Evans, Waite & Karmel, 2014). Retaining some type of visible identity marker to avoid a sense of fragmentation can be very difficult in this situation, but it is important for psychological and pragmatic reasons (Edwards & Usher, 1996).

For some non-permanent workers, expertise is increasingly deployed in relational and multifaceted ways, cutting across areas of specialisation. These workers develop multiple identities according to their positioning and contribution to different work teams they participate in. In occupations of all kinds, and at all levels, people come to *figure out* who they are, through the social, economic and political contexts in which they participate and by how they relate to others both within and beyond these contexts. Success can arise from the development of capabilities to make multiple transitions and to navigate these "figured worlds". Skills and knowledge have to be developed and changed as they are operationalised in the culture of new workplaces, requiring recontextualisation (Evans, Guile & Harris 2009) across mental, material, social and cultural planes (Lobato, 2003). Furthermore, it is not just the skills and knowledge that develop, but the whole person, as he or she adjusts, with greater or lesser success, to working in a new environment, as Hager and Hodkinson (2011) have argued. That adjustment depends as much upon the receptive or expansive nature of the new workplace, as on the individual non-permanent worker (Bound et al., 2014).

In their study of 100 non-permanent workers in Singapore in three different sectors, Bound et al. (2015) found that what they call "occupational affordances" (more appropriate for non-permanent workers than the concept of workplace affordances) "facilitate or inhibit the non-permanent worker's navigation of the complex terrain of non-permanent work," but, the authors remind us, "occupational affordances do not absolve the individual of his or her agentic involvement in seeking out and acting on the affordances*"* (p. 43). These authors found that being a purposeful non-permanent worker requires strong integration of entrepreneurialism, craft identity and learning-to-learn skills, or what they call "integrated practice". The combination of entrepreneurialism and craft identity enables recontextualisation, and reflexive and meta-cognitive learning, in deeper ways that guide the non-permanent worker to seek out certain jobs, people and learning, but not others, towards building specialised skills and carving a particular niche or positioning in the marketplace (Ibid).

Assessment for this kind of work needs to be holistic rather than atomistic. For example, does the assessment (formative, sustainable and/or summative) support learners' ability to combine entrepreneurial with technical, vocational and/or professional capabilities, build learners' capabilities to navigate complex multiple environments and so on?

2.1.3 Technological change

Technological change is often associated with a decline in jobs (Dubie, 2015), yet there is some contention in the literature on automation as to the effect of technology and automation on the nature of changes in work and job numbers. Clearly jobs have been lost to automation, but a number of authors in this field argue that as jobs are lost, so other jobs are created or different skill sets are required. What is relevant to our review of the literature for this report is the impact on skill sets, as it is this that most relates to what is intended to be learnt and assessed. Again, we see in this section the importance of holistic rather than atomistic approaches to assessment, but also the need to position learners to meet future unknowns. This suggests a need to build in sustainable assessment throughout the curriculum and learning design.

Brynjolfsson and McAfee (2012) argue that technology demands different kinds of work and skill groups: "the computer, like all general purpose technologies, requires parallel innovation in business models, organizational processes structures, institutions, and skills". Other authors note that a range of skills become important as automation increases, for example, project management, compliance management and business process management (Dubie, 2015); and Autor (2015) claims that interpersonal interaction, flexibility, adaptability, and problem solving workers hold comparative advantage over technological change. Brynjolfsson and McAfee (2012) note that skills such as leadership, team building and creativity will be increasingly important, "in a dynamic, entrepreneurial economy." Deming (2015) demonstrates that since 1980, "jobs with high social skill requirements have experienced greater relative growth throughout the wage distribution … employment and wage growth has been strongest in jobs that require high levels of both cognitive skill and social skill" (abstract). In general it would seem that there is a shift toward social, management and analytical skills. Clearly the type of work, and the form of production in which work takes place, strongly mediate the manifestation of these skills.

Brynjolfsson and McAfee's (2012) observation that "our skills and institutions will have to work harder and harder to keep up lest more and more of the labour force faces technological unemployment" is pertinent to our research project, as it is educational institutions and government agencies that fund and monitor them that are most relevant. It is these institutions that design learning and assessment and institutionalise practices.

2.1.4 Transitions

Changes in forms of production and technological change suggest transitions, transitions that may be required between different forms of production as a result of merges, closures and redundancies, technological change and so on. We can add to the idea of transitions when we consider different points of our lives (e.g. changing careers, re-entering work after a period of childcare, changing employment within a related occupation [Hinchliffe, 2013]). This is the landscape in which policy on lifelong learning is particularly relevant.

Hinchcliffe argues that "lifelong learning that does not focus on workplace identity is unlikely to promote in any substantive way the ability to handle transitions" (2013, p. 51). He reminds us that identity is not fixed, but is tied to practices[7] within given contexts. As such we need to learn the practices, the language,

[7] "Practices" are what social theorists (e.g. Bourdieu, 1977; Giddens, 1979; Ortner 2006) refer to broadly as human actions and their dynamic interactions with a social structure, entity and/or system. In particular, Schatzki (1996, 2002) refers to practices as ways of understanding, the explicit social

goals and purposes, and broader environment in which a practice takes place. Knowledge and skill are not neutral, but are socially constructed (Chappell, Rhodes, Solomon, Tennant & Yates (2003), thus it is important that a strong degree of reflexivity is required, along with a degree of self-reflection, in order to make the transition into new identities (Hinchcliffe, 2013). Reflexivity is an important aspect of lifelong learning and can be described as "the capacity to develop critical awareness of the assumptions that underlie practices" (Edwards, Ranson & Strain, 2002, p. 533). Thus learning (and assessment) is recognised, as more than the learning of knowledge, skills and attitudes; it is recognised as the "transformation of understanding, identity and agency" (p. 532).

What we assess is what we value (Knight, 1995). If we assess only knowledge and skill and not the aspects of lifelong learning discussed in this section (e.g. reflexivity, social capabilities, management capabilities, analytical capabilities, critical awareness, developing sense of agency, etc.) then our message to learners is that these aspects are not important. Yet, as Singh (2015) notes, "self-awareness – who we are and how to use our talents – is a precondition for 'deployability' and 'employability'" (p. 8). Deployability is the potential to continuously develop our general capability to enhance our contribution and participation in society (ibid).

When we look at aspects of the changing nature of work, the message is that assessment needs to be holistic, and that it needs to reflect the complexities of work. We need to teach and assess the "essence" of what we want our graduates to "be". Additionally assessment needs to include "learning to learn" capabilities to position learners to transit between and across settings and circumstances. Sustainable assessment is clearly important in developing learners' ability to meet future unknowns and make realistic judgements about standards of performance.

2.2 Shifting the lens on assessment

Building on our brief "definition" of assessment in Chapter 1, here we take the opportunity to delve further into what constitutes assessment and what informs different perspectives of assessment. Fitting with the discussion in section 2.4, we take a practice-based approach to assessment.

Understanding assessment as a measure of learning comes from the psychometric tradition. It results in a focus on assessment of learning (summative assessment) at the end of a programme, course, or activity where the results are used for purposes of certification. Certification is one important purpose of assessment. However a focus on assessment of learning is problematic for a number of reasons, including that it can result in assessing what is not intended, as Harlen (2007) points out:

> Teachers can be very effective in training students to pass tests even when the students do not have the understanding or higher order thinking skills that the tests are intended to measure. (p. 2)

Given the complexity of meeting future needs in the changing world of work, thinking of assessment as a "measure" of learning does not sit well with assessment for learning and sustainable assessment. Rather, it is more appropriate to consider assessment as a process of making judgements, not necessarily always by the teacher/assessor. Judgements are made against criteria or intended outcomes that are transparent to all involved in making judgements and giving feedback. The struggle is then the process of interpretation of what initially appears as precise but that precision evaporates as teachers/assessors, learners and workplace supervisors engage in unpacking what it means. Rather

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and institutional rules and/or conventions, and the affects of norms and normativisation processes. Schatski sums this up by describing practices as "a nexus of doings and sayings" (2012, p. 15).

than turn to breaking down outcomes into precise tasks, it is important to remember that work is messy and dynamic. As indicated in the previous section, the capabilities required of learners for and in the world of work are complex. This complexity needs to be reflected in assessment (Knight & Yorke, 2003).

The following section explores what a practice-based approach to assessment means.

2.2.1. A practice-based approach to learning and assessment

Traditionally theorisation of learning has focused on the individual, employing mostly linear metaphors of learning and development, such as the Dreyfus and Dreyfus (1986) novice-to-expert trajectory. When we use a practice lens, we understand learning as embodying the principles of practice as:

- a particular disciplinary field (e.g. mathematics, social sciences);
- a vocational field (e.g. cheffing, engineering, medicine);
- kinds of learning (e.g. critical thinking, "deep" learning); or
- work, that is, learning through engaging in the everyday practices of your work.

A practice lens enables us to strongly connect with our understanding of the changing nature of work. That is, as practices are emergent, not stable, so we understand the world of work to be constantly emergent, albeit to different degrees depending on the form of production, regulatory requirements, the "sticky-ness" of traditional practices and so on. We conceive learning as an ongoing process; the individual and collectives can produce social relations and practices, or change practices (perhaps in quite minute ways) as they make decisions, and take actions within everyday routines (Reckwitz, 2002). These processes may take place under circumstances that are emergent, and/or there may be inadequate information or knowledge on the part of the agent (individual or collective). In the process of engaging in work practices we are constantly in the process of "becoming" an engineer, a cook, a doctor and so on, albeit within the particular circumstances of the working environment. That is, knowledge, values and skills are not separate from the context of practice (Zukas & Kilminster, 2012).

So what is a "practice"? A practice is a "constellation of different people's activities … it embraces multiple people. The activities that compose it … are organised … a practice is an open-ended, spatially-temporally dispersed nexus of doings and sayings" (Schatzki, 2012, pp. 13–14). It is inclusive of rules, understandings, resources, purposes, material "things" and the relations between them. Hager, Lee & Reich (2012) outline five principles for theorising professional practice: practice as knowledgeable action, as embodied and materially mediated doings and sayings, as relational, as evolved in historical and social contexts and power relations, and as emergent (p. 8).

- Practice is more than applying 'theoretical knowledge' (p. 3) or a product of learning. Knowledge is not static but a process of "knowing in practice".
- People are invested in purposeful activity – there is an affective domain to practice; practice generates its own understandings and actions.
- Practice is embodied and relational. Thus practice is social and dialogical, co-producing ways of knowing in space and over time.
- Practices are not "stable, homogenous nor ahistorical" (p. 4); they evolve over time, in different places and circumstances. This includes how we govern ourselves and govern others, which in turn accounts for the way we work, learn and practice.
- Practices are emergent; we cannot specify in advance what they might be. Thus rather than thinking in binaries (e.g. mind–body, structure–agency, etc.), macro-thinking is more appropriate, such as, as ecologies, dynamics.

Through Hager et al.'s (2012) explanation of practice, we can readily see connections between the capabilities and qualities identified in the changing nature of work section that are becoming increasingly important, albeit in different ways and in different settings. For example, identity and agency for learning

make sense when we understand that knowledge is not static, that practices are emergent, and that practice generates its own understandings and is relational. The relationship between identity and learning is relational, dynamic and provisional (Fenwick, 2000, 2004). Agency for learning is mediated by individual sense-making of the context, as the context is mediated by the actions of individuals and groups, informing "ways of knowing, doing, and feeling" or, in other words, "a way of being" (Edwards & Usher, 1996).

2.2.2 Psychometric approaches

*"*Knowledge of educational products and educational purposes must become quantitative, take the form of measurement'' (Thorndike, 1922, p. 1 in Hodges, 2013, p. 564). Thorndike's work on "measurement in education" has had a long and far-reaching impact on assessment practices. Central to this idea is that learning can be measured on a behaviouristic concept of learning. This implies that being competent is the

> result of following a large number of small steps or modules, each of which has to be assessed at the end. Only after successful completion of a module can the student progress to the next. It follows then logically that assessment has to take a reductionist approach as well, viewing the total only as the sum of its constituent parts. (Lambert et al., 2011, p. 478)

When assumptions are made that mimic the line of assessment as a hard science, there is a concentration on uniformity and moderation, and being clear, fixed and precise about what counts as good performance and what does not. It is from these approaches that current conceptualisation of validity, reliability and fairness in assessment, rooted in the psychometric tradition, are a part of our everyday language when considering assessment. The psychometric tradition places a strong association between assessment considered as objective and assessment tools that are standardised (Hodges, 2013). Standardised testing conditions and homogonised test materials were considered reliable, resulting, as Lambert points out, in the atomisation of competencies into sub-tasks (ibid). One result of this approach is that "practice settings were often removed to make tests equivalent for all test takers" (ibid., p. 555).

> These assumptions [validity and reliability] are grounded on the ideas that phenomena are located within individuals; that there is a quantity or amount that can be measured; that this measure, or true score, is obscured by sources of statistical noise from extraneous factors that needs to be eliminated; and that the ability of tests to discriminate between individuals is something positive. (Ibid.)

This quote illustrates the assumption that what a person does, his behaviour or performance, is objectively observable (Holmes, 2001). But as humans, we do not "objectively observe and record actions, behaviours and performance, rather, we interpret them within a context. There is now considerable literature demonstrating that, in fact, authenticity increases validity (see section 2.2.3). Vaughan & Cameron (2009) note in relation to the medical field that the emphasis is moving away from gaining a certain number of marks in high-stakes examinations and more towards gathering evidence of clinical competence and appropriate professional behaviour and attitudes. Such evidence is seen every day in the workplace.

Not surprisingly, then, there are arguments in the assessment literature that "traditional" validity frameworks operate from perspectives which are incompatible with the goals of alternative assessment" (Teasdale & Leung, 2000, p. 164), suggesting a need for a different conceptualisation of validity and reliability. Knight and Yorke (2009), for example, state that summative assessment is in disarray, that examinations have limited reliability and validity, and that "cheat-proof assessment systems are often

accompanied by dull and lifeless learning that has short-lasting outcomes" (p. 20). The shortcomings of "traditional" summative assessment that some of these scholars have highlighted are perhaps amplified in work settings and situations where practices and priorities, needs and values are more varied and dynamic.

2.2.3 Work and assessment

Assessment through real-work activities has been found to be a much better predictor of ultimate performance than many formal or standardised tests (Gardner, 1999). Assessment is most valid when it is authentic; real work offers great opportunities for valid assessment, where assessment is based on actual performance, rather than inferred performance from a less-authentic task or activity (Vaughan & Cameron, 2010). Authenticity is likely to be strongest when the content of the assessment aligns well with the assessment task; when the assessment environment is realistic; where the degree of interaction allowed during the assessment is close to that which would occur in a real workplace; where the form of the assessment method is also valid; and where the criteria of the assessment are those valued by practitioners in the profession (Gulikers, Bastiaens, Kirschner & Kester, 2008). Realistic assessment environments provide opportunity to assess or make holistic judgements over time and as part of continuous learning, as opposed to judgements about separate tasks:

> Authentic work settings, in particular, provide opportunities for students to learn about all aspects of practice, including how to engage their "self" in practice and learning to take responsibility for decisions … instilling a greater sense of self-awareness, self-assurance and self-confidence" (Trede & McEwen, 2012, p. 28).

However, assessment in work settings goes beyond opportunities for the individual. A lot of work is collective in nature (requiring interaction and interdependence between roles, individuals, teams and networks) or at least networked in the sense that what one person does is interconnected and has implications as well as consequences for others. In writing about the medical field, Hodges (2013) notes that team-based competence has a direct impact on patient outcomes:

> Over a few decades, evidence about the importance of team-based competence in health care and in particular links to patient outcomes propelled the adoption of a number of new practices, including the preoperative briefing (''safe surgery checklist''). Many studies have since demonstrated improved patient outcomes when team-based training is employed (Haynes et al. 2009; Marr et al. 2012; Stevens et al. 2012). As research emerges that team training has a meaningful impact on patient outcomes, the notion that competence is something held by an individual surgeon, anesthetist, nurse, or individual anyone becomes more and more untenable. (Hodges, 2013, p. 566)

This example of changing learning practices indicates a need for assessment of collective practices rather than just assessment of individual competence. After all, as Hodges indicates, individual performance is influenced by workplace culture, the situation and other team members. Performance is directly influenced by others and by the context (Trede & Smith, 2012).

Not all workplaces offer positive, constructive experiences and opportunities for learning, resulting in potential concerns about reliability and validity of assessment. The issue of reliability can be addressed through stakeholder engagement and the building of strong relationships between provider, workplace supervisors and learners. Such a model however assumes stability in personnel and employment relations not evident in sectors that rely heavily on non-permanent work. In such sectors, relations may be between industry "masters", as opposed to workplace personnel (see Bound et al., 2015).

2.3 Engaging stakeholders

Stakeholders in assessment for learning for the changing nature of work can include:

- learners;
- curriculum designers;
- those who teach and/or assess what is to be learnt;
- educational institution/provider (the educational institution)
- professional bodies (where they mandate particular requirements or offer possibilities for continuing professional development that involves assessment);
- employers;
- supervisors, reporting managers and/or experienced colleagues in the workplace (learning and assessment may take place entirely in work settings, with or without an educational provider);
- licensing bodies.

In the literature, engagement of stakeholders is discussed in relation to collaboration and/or partnerships (sometimes the terms are used interchangeably) and partnership models. In this report, we use the term “partnership” to indicate a wide range of possible models and arrangements, as there will be varying degrees of formality in any partnership and because partnerships are dynamic and can develop and change over time.

The value of collaborative partnerships address many of the points discussed in the following section; authentic experiences that enable learners to experience holistically the complexities of vocational/professional life at work, and developing practitioner ways of thinking and being. For example, Carter, Sidebotham, Creedy, Fenwick, & Gamble (2015) explain that their work-based programme to develop practising midwives is to prepare students for safe autonomous practice, to develop their decision-making skills in complex situations, and to increase their motivation because “all learning is perceived to be relevant to their future professional practice” (p. 328). These factors are important for developing confident and competent midwives, for stimulating deeper learning or forms of engaged learning, and for enabling students to grow professionally. The potential role of different participants in a collaborative partnership for assessment and learning is discussed later in this section.

The literature on work-based learning makes reference to partnerships or relations with employers and between supervisors, learners and assessors from an educational provider point of view. It is less common for reference to be made to other stakeholders listed above such as the professional bodies and licensing boards. However these stakeholders are part of the ecosystem which govern performance standards and thus are important “players” in learning and assessment design, as their stipulated requirements can provide affordances or limit possibilities for good assessment and learning design. Indeed, collaborative partnerships are at the heart of work-based learning (Boud, Solomon, & Symes, 2001; Smith & Betts, 2000).

Reeve and Gallacher (2005) state that in the United Kingdom (UK), the number of higher-education programmes involving work-based learning was once extremely low. Part of the reason for this, they suggest, is that developing partnerships or collaborative working relationships is highly problematic, with reports of breakdowns in communication over the aims of the partnership, different languages and cultures, problems in managing power relationships and limited development of trust. Different educational institutions/providers have different historical practices in relation to learning and assessment, which will potentially be at odds with the understanding of assessment and learning they encounter in different industry sectors and across different employers, where workplace conditions for learning and assessment (Vaughan & Cameron, 2010) could also vary. In work-based learning arrangements, these are issues that providers/educational institutions must deal with and make visible in the process of negotiation. Duckenfield & Stirner (1992) categorically state that for work-based

learning to be effective, “there must be partnership between the learner, educational institution and the ‘employer’” (p. 26). These authors highlight the importance of all the parties being involved in the planning of work-based learning; it is a process that requires negotiation “with the aim of achieving clear and well understood definitions of roles and responsibilities” (p. 23).

Historical practices such as those found in the Singapore CET sector, where classroom delivery has been highly predominant (Bound & Lin, 2011a), may indicate additional challenges for stakeholders. The need for collaborative partnerships between stakeholders suggests very different roles for educational providers, educators, employers and indeed any other stakeholders involved in what we call an educational “partnership”. So, what is it that stakeholders need to consider and manage as they seek, enter and look to manage an educational “partnership” for the long term? Such consideration will include the nature of the partnership and factors that enable (inclusive and effective) partnership, so as to offer possibilities for authentic and holistic assessment.

2.3.1 What to consider in initiating and managing partnerships

Although different authors highlight different aspects of the partnership relationship, there are common elements to be found in the literature. Partnerships in and of themselves are sites of learning, particularly when these collaborative partnerships involve seeking agreement and establishing processes for learning and assessment at, through and for work. The diversity of the stakeholders with their different purposes, intents, sets of rules, norms, cultural ways of being, language use and understandings of key terms (e.g. learning, assessment) can contribute to learning for those involved if the participants can find common or shared intent and purpose, and make visible tensions and difficulties (Bound, 2007). Table 2.1 represents some of the common points found in the literature to be necessary for effective partnerships:

Table 2.1

Phases in a collaborative “partnership”	Suggestions for developing and maintaining collaborative “partnerships”
In the beginning …	• Begin the negotiation by exploring areas of overlap, shared interests and outcomes. Respect each other’s aims and vision, and be willing to accept differing organisational cultures (NCVER, 2006). • Clearly define the goals and intent of the partnership and give reasons for considering a partnership (NCVER, 2006). • Organise discussions and meetings in a place that does not put any of the parties at a disadvantage (NCVER, 2006).
Establishing the collaborative partnership	• Learn how each other’s organisation operates (NCVER, 2006). Make a conscious effort to get to know other partners’ interests, ways of working, challenges and concerns (Bound, 2007; Stack, Beswick, Brown, Bound & Kenny, 2011). • Clarify the various understandings of learning, assessment (Reeve & Gallacher, 2005), and knowledge and skills, in addition to other key terms

	• Decide at the appropriate time the degree of formality within the partnership. Document the roles and processes for exchange of information and establish a conflict resolution process that is inclusive (NCVER, 2006).
Maintaining the 'partnership'	• Be cognisant of the different ways of working and different use of language – although some words used may be common, there may be different understandings of these words (Bound, 2007). • Maintain the partnership with regular communication to build trust and better enable exchange of relevant information – an important basis for effective partnerships (Bound, 2007; Brindley & Ritchie, 2000). • Make expectations visible (Winter, 2001) and open for discussion. Such clarity also means that learners are able to compare their expectations and seek clarity • Recognise that agendas and purpose evolve over time and that partnerships mature over time (Stack et al., 2011). • See tensions and difficulties as opportunities to be used to strategically develop richer understanding and mutual trust (Stack et al., 2011). • Value each member of the partnership; do not assume that you have greater knowledge or skills, rather assume that everyone has something different to contribute. This is an important aspect of addressing perceived (and real) power differentials (Stack et al., 2011).

These are general guidelines. More specifically, stakeholders need to negotiate collectively to put in place assessment tools that meet the vested interests of all partners in the learning process (McEwen, O'Connor, Williams & Higson, 2010). Issues of validity can be addressed by drawing on the expertise through developing alignment and agreement of expectations and roles between educators and workplace supervisors (McEwen et al., 2010). As they are agreed upon by the parties involved, agreements should be documented while at the same time creating space for taking advantage of "the unexpected" learning outcomes that workplace learning often introduces (McEwen et al., 2010; Winter, 2001). There needs to be clarity about what the outcomes mean for learners. This requires thinking about the writing of learning outcomes that meet the needs of accreditation yet are written flexibly enough to make the most of opportunities that arise.

Auspiced arrangements enable sharing of expertise (Bateman & Clayton, 2002). Bateman and Clayton (2002) describe auspiced arrangements in the vocational education and training sector in Australia as involving "an organisation entering into partnership with a Registered Training Provider [RTO] in order to have the training and assessment that it does recognised under the National Training Framework" (p. 6). The RTO has responsibility for ensuring quality standards are met and maintained. These authors point to the success in providing extensive supporting information, guidelines and exemplar agreements for auspiced arrangements developed by state regulatory authorities. Other artefacts that have been found in Australia to assist in the negotiation process include the mechanism of VET training packages. However Guenther, Falk, Arnott, Lucardie & Spiers (2008) stress that the training packages should not

be treated in the negotiation process as something in their own right, but as a mechanism which can assist in bringing focus.

Other suggestions for enabling educational providers to access the expertise and placement of their students with SMEs, for example, include support for SME employers through forming peer-support relationships (Vaughan & Cameron, 2010). Roving assessors from providers/educational institutions need to have a clear understanding of their role, including learning support for employers about formulating workforce development plans across the business (ibid). Communication between partners needs to be holistic and not partial. Carter et al. (2015), for example, point out that healthcare partners needed to be aware of the scope of the assessment throughout the entire midwifery programme, in order to develop their confidence in the work-based learning that contributed to preparing students for practice.

Hughes, Karp & Orr (2002) found in their American study of partnerships for education that employers are initially likely to participate "on the basis of self-interest but begin to view their participation in more philanthropic terms over time" (Bailey, Hughes & Karp, 2000, p. 382). Kinman and Kinman (2000, p. 15) report on one manager's comment that "If it won't go on one side of A4 forget it, it will go straight in the bin", and "we don't talk about it here, we fix it" (p. 9). These two quotes highlight the importance of each party in a collaborative "partnership" constantly seeking to understand the purposes and practices of the other in order to develop a shared language to meet agreed outcomes.

Assessors in workplaces may be both supervisors and mentors who blend instances of formative assessment with summative assessment as they guide students in their developing practice (Trede & Smith, 2012). Such approaches value assessment for learning, challenging the dichotomy between formative and summative assessment. It is important that learners have clarity about what is being used for summative assessment; lack of clarity is likely to stifle the asking of curious questions, creativity and being innovative for fear of being wrong and losing grades or being judged as not yet competent. This concern brings us back to the design and clarification of learning outcomes – if curiosity, initiative, agency and creativity are valued, then assessment processes and tasks need to mirror or be aligned with the outcomes.

Workplace or industry practitioners may have limited preparation and support for their roles of "teaching" and assessing. These individuals can also change, sometimes quite rapidly, "so maintaining close partnerships can be difficult and therefore makes quality problematic" (Trede & Smith, 2012, p. 192). McEwen et al. (2010, pp. 72–73) suggest that the literature indicates variable practice and "slack assessment practices" such as inadequate guidelines, unclear goals and few details about standard requirements. Examples include site supervisors being required to write a paragraph on how well the student had performed but were not given any heading, guidelines, criterion reference points or suggestions as to what constituted satisfactory at which level.

In work-based learning circumstances, the number of learners may mean it is impractical for an educator to be able to oversee and assess the capabilities of students in multiple workplaces, hence the value of "collaborative partnerships" or auspiced arrangements. As part of such arrangements, it is important that learners develop their ability to make realistic judgements about their work; doing so also contributes to addressing issues of validity. Supervisors across multiple worksites being asked to assess can lead to issues of reliability (McNamara, 2008). Therefore careful consideration needs to be given to the different roles of those involved. Final judgements for the purposes of summative assessment need to be from multiple sources and across a range of different types of activities.

Partnerships are a key feature of workplace-based learning and assessment (see also Boud, 2000). Although challenging, they offer possibilities for authentic and holistic assessment.

2.4 The making of assessment judgements

Given the expansion of capabilities being posited as important for the changing nature of work, assessment needs to do more work than previously. That is, it needs to move beyond technical and content knowledge to contextualisation and recontextualisation of knowledge (Evans, Guile, Harris & Allan, 2010), including "practical and critical understanding, moral and ethical dispositions, social and relational ability, performance that is flexible and creative to meet contextual needs" (Trede & Smith 2012, p. 189) and critical reflection (McEwen et al., 2010) or reflexivity. We need to move beyond testing and measurement to seeing all these aspects in relation to each other to form a judgement on practice (ibid). Additionally we cannot assume that good professional practice in one context is the same as in another context.

Just as judgements made in the process of work vary from individual to individual and from time to time, so too do assessment judgements. Boud and Soler (2016) suggest that the qualities of judgement that need to be developed are similar for students and for teachers; it is only the subsequent ends to which these judgements are put that differ. Key elements of developing informed judgement from the perspective of the students include:

- identifying oneself as an active learner;
- identifying one's own level of knowledge and the gaps in this;
- practicing, testing and judging;
- developing these skills over time;
- embodying reflexivity and commitment.

Issues of reliability are readily addressed through processes and design strategies such as constructive alignment (Biggs, 2003), and collaborative interpretation of criteria against which judgements are made and moderated. Additionally judgements create new sets of relations in an environment (Hager, 2001), that is, judgement is pertinent not just to the individual, but the context in which they are made.

To explicate what we mean by judgement, we go back to Dewey. Dewey subsumed concepts and propositions into "a wider capacity called judgment which incorporates, the cognitive, the ethical, aesthetic, conative [the effort of the agent in a specific action] and other factors" (Hager, 2001, p. 355). Judgement is a "prime integrative capacity that underpins learning" (p. 358); that is, judgement is not peripheral to learning. In this sense we understand that it is important to develop learners' capacity to make judgements, as in sustainable assessment (Boud, 2000; Boud & Soler, 2016). "The judgments we make as individuals about our own learning and on the learning tasks constitute assessment" (Edwards, 1997).

However this does not restrict the making of assessment judgements to formative and/or sustainable learning, where learning is the focus and purpose. In formative and sustainable assessment we assume knowledge is dynamic, not static, is contextual; we also assume that learning involves both individual cognition and social interaction through interaction with "tools" (e.g. ideas, concepts, physical tools such as computers, phones, a hammer, etc.) Making summative assessment judgements is also informed by how we think about knowledge and learning, and what we value and consider important (Knight, 2009). Such thinking will be evident in the design of the assessment task(s) and the criteria against which judgements are made. In discussing Dewey's work in relation to judgement, Beckett (2012) made the following observations:

- Assessment needs to reflect the multifaceted and complex "realities" of learning, i.e. learning is no longer understood simply as mechanical processes of acquisition and transfer of knowledge and skills, but encompasses notions of embodiedness and situatedness as well as

having properties or characteristics of emergence that arise from the interplay of social, organisational and cultural factors.
- Assessment needs to be situated in work defined as "being", as part of human life and the human condition.
- Assessment needs to consider the formation of "purpose" that emerges in the processes of work and learning, exemplified in, for example, the making of judgement calls.

In practical terms, this emphasis on purpose, being, and the complexity and dynamism of work, means we need to pay attention to the following in the making of assessment judgements:

- clarity of standards and outcomes as discussed in the section on stakeholder engagement (Bennett, 1999);
- writing learning outcomes in ways that allow and encourage "unexpected" learning outcomes (McEwen et al., 2010);
- using multiple sources of evidence, including self-assessment (Bennett, 1999; Boud, 2000; Boud & Soler, 2016);
- using evidence from a range of sources/roles (e.g. learner, peers, educators, work supervisors, etc.) (ibid);
- design assessment to address multiple outcomes and aspects (ibid).

We also need to accept that there will be variation in judgements, but address issues of validity in relation to such variation through:

- transparency of criteria against which judgements are made;
- agreed understanding with assessors of the interpretation of the criteria, including the learners (Winter, 2001);
- including processes of moderation where appropriate (ibid).
- develop learner's ability to make realistic judgements about their own performance (Boud, 2000; Boud & Soler, 2016).

For an explanation of criteria, performance standards and rubrics, see Appendix A.

2.5 What constitutes "leading" assessment practices?

Assessment practices are far more than assessment techniques and assessment plans. Rather, as discussed in section 2.2.1, assessment practices are a "constellation of different people's activities" in relation to assessment, including their "dispersed nexus of doings and sayings" (Schatzki, 2012, pp. 13–14). Given that activities are driven by beliefs and mediated by the context in which they take place, this means that when we consider assessment practices, we must also consider:

- stakeholders' individual beliefs about learning and about assessment;
- stakeholders' experience and exposure to different kinds of assessment practices;

- their role, contribution and power in making decisions and influencing practice;
- historical practices of the institutions involved (e.g. IHL, training provider, employer, professional body, licencing body, etc.).

As indicated in section 2.5, different stakeholders in a collaborative "partnership" will have different roles in different settings and differing expectations. Thus a first principal, as highlighted in section 2.5, is to manage and engage stakeholders in ways that meet the intent of the learning and assessment. In terms of workplace-based learning, who the instigating stakeholder is and what their purpose is will strongly mediate their assessment practices, influencing their engagement of other stakeholders. It is important that each stakeholder make visible their own assessment and learning beliefs, practices, rules of engagement (as in their power to make decisions, their commitment of resources and capabilities, etc.) and of course what they value and want from the engagement. Agreed purposes of assessment, assessment activities, reporting processes and formats are important components of stakeholder engagement. Another important aspect of collaborative "partnerships" is clarity of roles and the capabilities and tools to undertake these roles. If, for example, workplace supervisors have a role in assessment, then it is important they are given the opportunity to develop the necessary capabilities to undertake such a role. All these processes may apply within a single institution/organisation or across institutions/organisations.

Assessment practices for the changing nature of work will seek to address the following:

- assessment practices that engage learners in learning (Boud, 2010);
- developing learners' capability to face new challenges and unknown future situations (beyond the course);
- that feedback from all involved is built into the design of learning and assessment in a cyclical, ongoing process (Fenwick, 2014; Boud & Soler, 2016);
- assessment that is authentic (including summative assessment activities);
- holistic development of learning outcomes and assessment activities;
- alignment between learning outcomes, learning activities and assessment activities (Biggs, 2003; Yorke & Knight, 2009);
- design of assessment activities that are varied (Fenwick, 2014), requiring multiple forms of evidence from multiple sources over time (Tigelaar & van der Vleuten, 2014).

The following identifies specific aspects of assessment highlighted in various ways in the literature.

Authentic assessment reflects the demands of real practice, where the design of assessment activities draw on real work practices. Such assessment activities do not necessarily need to be situated in or at a workplace. However, there needs to be purposeful engagement with the context (Trede & Smith, 2012) of work/professional/vocational practice.

Holistic assessment moves well beyond assessment of knowledge and skills to what Bound et al. (2015) call "integrated practice". By integrated practice, these authors mean that craft/vocational/professional capabilities are integrated with learning-to-learn, meta-cognitive capabilities and, in the case of non-permanent workers in their study, entrepreneurial capabilities. However, this latter can be thought of as the soft or generic capabilities, including ethical practices as they are enacted in a profession or vocation. Tigelaar & van der Vleuten (2014) point to aspects of the same idea in their observation that "competencies are multidimensional inclusive of situational awareness, not just cognitive skills and knowledge". Holistic assessment not only contributes to the development of the learner as a professional; it also plays a role in socialising the learner into a community of practice. In this regard, assessment is "not for knowledge but for practice knowledge, not for individual achievement but for relational inter-professional capabilities, not for being competent within practice norms but for actively contributing towards the social common good" (Trede & Smith, 2012, p. 196).

Section 2.2.1 identified a range of capabilities related to current and potentially future changes in work. We will label these as "**future-oriented**" capabilities. We include here not only the abilities developed through sustainable assessment as part of making sound judgements about their performance and that of others (Boud, 2000; Boud & Soler, 2016), but also:

- reflexivity (Trede & Smith, 2012), referring to the capability to be critically aware, and to identify and question assumptions (Edwards et al., 2002);
- agency and identity (Billett, 2006; Bound et al. 2015; Hinchcliffe, 2013);
- soft "skills" such as interpersonal interaction, flexibility, adaptability and problem solving (Autor, 2015) and social skills (Deming, 2015); and
- creativity (Brynjolfsson & McAfee, 2012).

These capabilities present challenges in terms of assessment. Some of these capabilities relate to the individual, others are collective in nature, most are both individual and collective and their enactment is dependent on the context. There is also a close relationship with designing assessment that is holistic, as future-oriented capabilities are about not only the whole person, but about specific work-related practices. This suggests collective forms of assessment.

Alignment or "constructive alignment" (Biggs, 2003) tells us that the curriculum, its outcomes, the learning activities (teaching methods) and assessment activities all need to be aligned to each other. There needs to be consistency in each of the different aspects of the curriculum, including in the enacted curriculum (curriculum as it is taught). Thus, when considering assessment, curriculum designers and facilitators need to ensure all forms of assessment – formative (assessment for learning), summative (assessment of learning) and sustainable (inclusive of assessment as learning) – align with the learning outcomes/competencies and the learning activities. For learning and assessment to achieve alignment, it requires an iterative process between how to capture and write the learning outcomes, as well as how to develop the learning and the assessment activities, to achieve coherence between module assessment methods and programme specifications (Yorke & Knight, 2009).

2.5.1 Specific assessment and learning practices

If we apply the principles of "leading" assessment practices listed in the previous section, then we immediately see that many of the traditional forms of assessment do not meet these principles. As Fenwick (2014) emphasises, the starting point is always to address the question, why conduct the assessment? What is its purpose and who is the assessment for? Tests and multiple-choice questions (MCQs) that come from a psychometric tradition leave learners unable to demonstrate the depth and breadth of their abilities (Darling-Hammond, 2014). As Darling-Hammond notes, educational institutions tend to teach to what is tested, rather than focus on performance that is holistic and reflective of practice. MCQ tests, for example, "do not represent nature of performance in the real world which rarely presents people with structured choices" (Darling-Hammond, 2014, p. 5). Testing that is decontextualised and atomic tends to test at a low cognitive level, placing the responsibility for learning on the tester (as opposed to the learner) (Tigelaar & van der Vleuten, 2014) and learning for summative assessment, sometimes high-stakes summative assessment. However, "tests" that are designed for "learning of", for example, basic terminology, (i.e. an activity that requires recall – low cognitive ability) can be said to have some value.

Darling-Hammond (2014) provides an example of an assessment for physics students set in an educational institution in Hong Kong. First, students were asked to identify the amount of current flowing through a resistor under different conditions, and to explain their answers. Then they were asked to sketch the time variation in the potential difference of the electrical pressure when a switch is opened, before they were asked to show how they would modify the circuit to demonstrate particular outcomes under different conditions. "This type of question requires students to demonstrate a greater depth of

knowledge, comprehension, application, analysis and evaluation, using their knowledge flexibly under changing situations, an important twenty-first century skill" (Darling-Hammond, 2014, p. 19).

To enable people to relate their work-based "problem-oriented learning to their own longer-term goals and development," Stephenson (2001) suggests an approach he calls the capability envelope. The envelope consists of three stages with each stage providing a structure within which learners (employees) can engage in discussion with other learners, their employers and the awarding body (if there is an awarding body involved). The whole process can be repeated many times.

- The first stage is one of exploration that takes place at the very beginning of the process and ends with an agreement on what will be done. The agreement often takes the form of a learning contract between those involved (e.g. learner, employer and awarding body).Through dialogue, the learner reflects on their prior experiences, articulates their aspirations, explores possibilities and establishes an overall plan for their own development through work.
- The second stage is progress review which is a continuous part of the learning activity. Learners monitor and review their progress (with appropriate assistance and guidance), share their learning with others and judge their own progress and learning needs.
- The third stage is the demonstration stage towards the end of the learning episode. Learners are helped to articulate not just their specific achievements but also their personal learning and plans for continuing professional development.

For those seeking accreditation, the envelope has two additional parts. The first of these is to negotiate and register the learning plan with the accrediting body, and the second additional part is a formal assessment by the accrediting body – the criteria and outcomes for the formal summative assessment would be part of the negotiated learning plan registered at the beginning of the process.

The success of this approach clearly requires a supportive learning culture and active support from supervisors. The kind of work learners undertake also influences the depth, extent and formality of learning plans and sharing processes (e.g. cooks compared with IP managers). However, if the employer organisation is supportive, there is potential for the general idea and approach to work in a variety of settings. The value of this approach is that while the focus is on the individual, there is a requirement (and presumably an expectation) that the learner will acknowledge their dialogue with, and contribution of, others.

Fenwick (2014) notes that while growth plans (such as Stephenson's capability envelope) are beneficial in developing and encouraging learning in practice, such approaches (including for example, learning-event logs and assessment checklists) assume learning is only an individual, psychological process. This conception of learning is at odds with many work practices today that are collective in nature, or interconnected, and have implications and consequences for others; the conception of learning "appear[s] to embed an assumption of acquisition, as though knowledge is a pre-existing substance ingested by the learning individual and then transferred to practice" (p. 1285). In Stephenson's capability envelope, there is no acknowledgement of power relations in a work setting, where to name areas that need further development may impact on employment relations, status and perception of the individual. One way to address this dilemma is where employees decide for themselves on a dilemma they wish to address collectively (Fenwick, 2014).

> Participatory assessment, in particular, would focus on collective identification of bench marks or snapshots of practice that can be compared at different stages, flexible indicators from different perspectives to help characterise what is emerging and what counts as outcomes, and language to describe processes, strategies and uncertainties. Participatory assessment would also capture and compare individuals' perceptions,

> assumptions and judgments about the process and its outcomes over time. (Ibid., p. 1289)

Understanding assessment as participatory changes the role of the assessor from one who has all the answers to one who is reflexive and a constant learner. Reflexivity is the ability to self-assess, to see self within the social practice context with others and to self from others' perspectives" (Trede & Smith, 2012, p. 197).

2.6 Conclusion

What we assess is what we value. For example, if what curriculum designers and assessors assess is technical only, then the message to learners is that using this technical knowledge to identify and solve problems, to negotiate with and influence others and so on, is not important. This review of the literature has identified that assessment, which is authentic, holistic, future-oriented and aligned with the learning outcomes and learning activities, is likely to meet the changing needs of the workforce now and for the future. No longer can we think of assessment as measurement and as objective; measuring performance that is isolated from the context of the performance fails to meet the changing needs of work and fails to enable learners to negotiate the multiple transitions we experience in our working lives.

Assessment that recognises the complexities of performance and that brings together opportunities for performance is reflective of the lived reality of work, which will require a considerable rethink of historical practices and ways of thinking about assessment. Not least, these changes involve the need to engage in collaborative partnerships between relevant stakeholders. Such partnerships are always problematic, not easy and take time to evolve. Nevertheless the rewards for the sector and for industry can be high.

3. Preparing Practitioners for Assessment in the CET Sector

3.1 Introduction

Many CET trainers, be they WSQ trainers or not, undertake ACTA. In our CET context, it is therefore useful to analyse the assessment unit in ACTA, along with the relevant DACE units, as each training organisation is now required to have a qualified DACE practitioner on staff for ensuring quality of curriculum design. This analysis is one means of describing and situating current considerations of assessment in the CET sector, or at least what is promulgated by the leading trainer of trainers for the sector. We draw on the documentation kindly provided to us to undertake this analysis. The limitation of using documents only is that we miss the richness that may be evident in the delivery of these units. Nevertheless, written documentation conveys powerful messages, expressing the institutionalised discourses around assessment, learning and curriculum design. It should be noted that this analysis is different from an evaluation. Our analysis is undertaken with the insights from our review of the literature and from our findings in our case studies.

3.1.1 ACTA

The documents we draw on for this analysis of ACTA include learner guides, facilitator guides and assessment plans for the following units: “Develop a competency-based assessment”, “Conduct a competency-based assessment” and “Assess competence”.

Competence has long been defined as “knowledge, skills and attitudes” related to work. In the ACTA unit “Develop a competency-based assessment”, “competency is the knowledge, skills and attitudes that are required to perform the activities of a given role or fulfill a particular job function effectively” (ACTA V4 CU5). In the next unit of the programme, learners are introduced to the five dimensions of competency.

Competency is a broad concept that includes all aspects of work performance. The five dimensions of competency are:

- **task skills**: perform individual tasks to stipulated standards;
- **task management skills**: manage a number of different tasks within the job to complete an entire work activity;
- **contingency management skills**: the ability to respond to problems and irregularities;
- **job and role management skills**: to deal with the responsibilities and expectations of the workplace, including working with others;
- **transfer skills**: transfer the attitudes, skills and knowledge to new situations and tasks (ACTA CU6 v2.11 [2]).

These dimensions form the basis of the Job Competence Model (Mansfield & Matthews, 1985) that was developed alongside UK occupational standards and was recommended within the early guide to UK National Vocational Qualifications assessors. It may be seen as an attempt to make the standards more dynamic by suggesting how the various components might interact with each other (Burke, 1989). Breaking down competency into knowledge, skills and attitudes, and job dimensions makes it easier for the job designer to address different parts and tasks of work. The limitation of this approach is that the parts often remain as parts, separate from each other; the relations between them are not necessarily

appreciated or understood. This becomes highly problematic when, historically, providers and practitioners are used to classroom-based delivery, removed from the context of work.

Bound and Lin (2013) describe the learning of trainee chefs at work, where relations between the different parts and dimensions are integrated. The trainees' exercising of discretionary power, their opportunities to contribute (e.g. ideas for dishes and participating in sharing sessions) contribute to the development of their professional identities as chefs. One of the trainees, Wei, explains that he has "the ability to make decisions and to apply what I know, and to apply what I have learned", and as he utilises his technical skills, he builds up confidence in his abilities as a professional chef: "You trust your skill and you trust your knowledge even more." In this example, knowledge, skills and attitudes are not separate from each other, there is no list of know-what and know-how to be ticked off; rather, we see a whole person and the ways in which his shared feelings, thoughts and actions at work (Beckett, 2000) contribute to his identity as a chef. He is developing not only his skilfulness and understanding, but also his confidence.

> With confidence, he moves beyond rule following, extending his pattern recognition, understandings, and skills into new situations. His growing confidence enables his constant making of judgments. Beckett (2000, p. 48) notes that [t]here is an emphasis on the cognitive and the affective and the social dimensions of work life, all intertwined in real issues and challenges, and intended to bring about the acquisition of unhesitating and confident action. This "bringing about" overtly deals in replicative skill acquisition (the technical), but in "whole person" situations of contingencies (Bound & Lin, 2013, p. 414).

This example highlights not only the possibilities for learning for work but also the possibilities for assessing holistically, considering assessment beyond knowledge, skills and attitudes to the entwinement of "the cognitive and the affective and the social dimensions of work life, all entwined in real issues and challenges" (ibid).

Eraut (2004) notes the integration of classroom and work settings enables:

- developing competency in a range of settings (e.g. classroom, workplace or online) where you are part of a collective;
- emphasising learning to learn (meta-competencies);
- reading, and adapting to, different environments;
- making judgements and taking anticipative action individually and collectively;

and thus:

- developing an understanding of the work individually and collectively; and
- becoming – growing towards expertise within a given vocation.

ACTA places value on assessing for work, as evidenced in the statement from the learner guide for conducting a competency-based assessment:

> Assessment also focuses on the learners' ability to perform their work in the relevant work contexts. The context of assessment will differ with candidates from different industries, types of organisation and workplace. When designing the Assessment Plan, the designer needs to consider the different contexts that are appropriate and relevant to the candidates, while ensuring the assessment meets organisational, industry and legal requirements (ACTA CU6 LG v2.11 (2) ,p. 14).

Additionally, the learner guide (ACTA CU6 LG v2.11 (2), p. 25) lists the range of stakeholders as including line manager, supervisor of learners, assessment manager or training manager, assessor, facilitator, subject- matter expert/specialist and manager of assessment centre. This assumes a negotiated process between the provider and the employer. The inclusion of roles from the workplace indicates the need for negotiation with these roles. This approach is strengthened in the advice about the relevance of the assessment plan to the organisation.

To ensure the assessment plan is relevant to the organisation, the assessor needs to contextualise the assessment plan by adopting/adhering to:

> **organisational requirements**, e.g. the candidate's organisation policies, procedures (SOPs), work processes and/or organisational terminology;
>
> **operating/workplace environment**, e.g. using the type of tools, equipment and materials, and the tasks/roles/problems encountered at work, or resembles candidate's real work environment;
>
> **Industry requirements**, e.g. the industry code of practice, standards, practices, rules and regulations (e.g. occupational safety and health guidelines);
>
> Relevant **legal** requirements, e.g. Workplace Safety & Health Act, Consumer Protection (Fair Trading) Act, Environmental Public Health (Food Hygiene) regulations, Employment Act or Copyright Act;
>
> **Learners'** profile, e.g. age, gender, work experience, education/literacy/numeracy levels and special needs (if any) (ACTA CU6 LG v2.11 (2), p. 25).

However, according to the documentation, learners are not given the opportunity to engage with this content knowledge; it remains as abstract. Additionally when we delve deeper into the ACTA materials, we find that the major "authentic" assessment examples given are about role play, using a competency unit from the retail sector. There are a number of points to note here. While reference is made to assessing in the workplace and/or authentic assessment (reflective of the work), as in the above examples, it is not a principle that is visible in the curriculum materials. Additionally, the retail unit ("Sales and customer services, competence unit Sell products and services, competency element Recommend products and services, competency level 1", used as an example of WSQ assessment) lists knowledge, skills and attitudes separately. This sends a message that holistic assessment is not important, but that what is important is the ticking off of the separate knowledge, skills and attitudes. The power of the major example of WSQ assessment given in ACTA (i.e. "Sales and customer services, competence unit Sell products and services, competency element Recommend products and services, competency level 1") cannot be underestimated in the messages it sends to learners. However, there is potential to use this example in a different way by analysing it. ACTA facilitators can ask their learners questions such as "Does this assessment plan reflect performance in the workplace?" It is a good example to use as, although only a few ACTA learners may be retail staff, everyone has experienced products and services being recommended to them. By analysing such examples, ACTA learners can develop and be introduced to a set of principles about holistic and authentic assessment.

Importantly, ACTA teaches participants that assessment is about judgement:

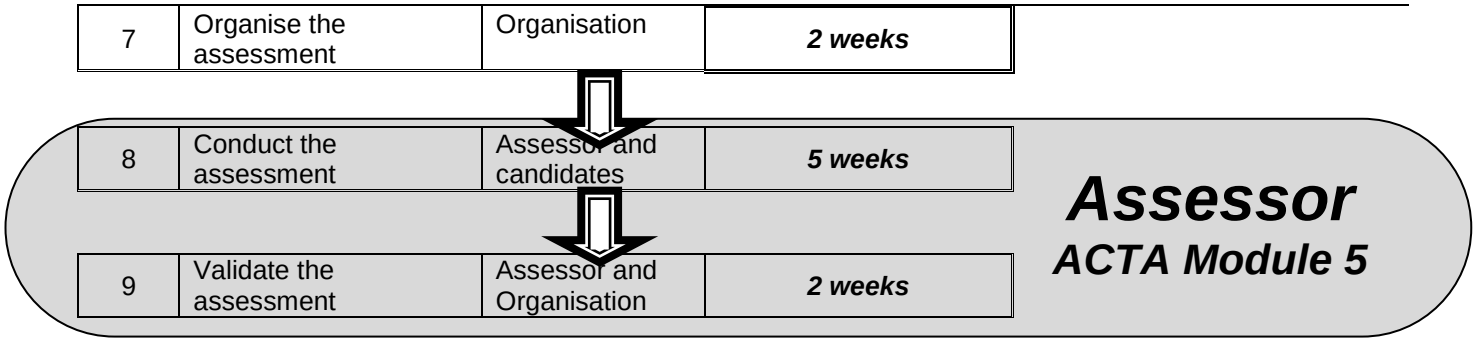
> Assessment is a systematic process of collecting information about a learner's progress, and using that information to make a judgment as to whether an individual has achieved a desired level of competency. (ACTA CU6 LG v2.11 (2), p. 14)

Also important here is the reference to “collecting information about a learner’s progress”. This is suggestive of the valuing and importance of formative assessment. ACTA participants are introduced to types of assessment – diagnostic, formative, summative and skills recognition. And of course participants are taught the “principles of assessment – validity, reliability, flexibility, fairness”. However, the enactment of formative assessment takes an interesting twist. A diagram in M5-01 ACTA V5 Module 5 learner guide explains the time it takes and who does what in the development of an assessment plan.

Figure 3.1 Diagram from M5-01 ACTA V5 Module 5 learner guide showing process for developing an assessment plan

Step	What happens	Who?	When/How long?
1	Identify purpose and context of assessment	You and stakeholders	***Day 1*** • Organisation appoints you as assessment developer • You meet with stakeholders to trash out assessment details and requirements
2	Obtain relevant industry competency or other standards contextualised to targeted audience	Organisation	***1 week later*** • Organisation/ATO will provide you with Competency Standards
3	Identify evidence required to determine competency	You	***2 months***
4	Select assessment methods		
5	Establish assessment tools and other protocols		
6	Conduct validation meeting	You and stakeholders	***1 month***
	5.5.1 Update assessment plan	You	
	5.5.2 Submit for approval by organisation	You and stakeholders	
	5.5.3 Submit for approval by QAD in WDA	Organisation	

Developer (DACE) & in-house trainers



TOTAL ***5.5 months***

The first task of the developer (a DACE graduate) is to identify the purpose and context of the assessment, followed by obtaining relevant standards, identifying required evidence, selecting methods, establishing tools and then conducting the validation meeting, updating the assessment plan and submitting it for approval. Following approval, an ACTA graduate can conduct the assessment.

There are a number of assumptions behind this diagrammatic representation:

- assessment is separate from the learning;
- assessment is assumed to be entirely summative;
- as a result there are no feedback loops designed into the whole process ;
- there is no reference to aligning the assessment design with the learning activities

Importantly in relation to the making of assessment judgements, there is a discussion of evidence as "information that provides **proof of an assessed person's competence**, and should be matched to the competency standard selected for use" (M5-01 ACTA V5 Module 5 LG). Four rules are given for the collection of evidence: it must be authentic, valid, sufficient and current. "Authentic" here is explained as "Where you do not have the opportunity to observe your candidates carrying out activities or producing evidence first hand, you will need to take steps to confirm that your candidates' evidence was really produced by them to authenticate it" (ibid). This is a different understanding of "authentic" to that which we discussed in Chapter 2. Authentic in this quote from ACTA documentation refers to, is the work done by the learner and not by someone else? There is a concern here that is expressed as a lack of trust in the learners, perhaps engendered through the short time that facilitators have access to their learners, because of the short modules in WSQ, and the separation of facilitator from assessor, resulting in the assessor not knowing the learner. One way to address this concern is to ensure that the facilitator and the assessor are the same person. To overcome confusion with authentic assessment (as opposed to authenticating assessment), different terminology could perhaps be used.

This is further evidenced in the instructions for the role play based on the retail WSQ module. The assessor is instructed to ensure the candidate cannot see the observation checklist. That the assessor is advised that the candidate should not see the observation checklist suggests a lack of transparency in the assessment process. What learners are being assessed on should be transparent to ensure they are clear about what the expected standards are. Use of an observation checklist could be valuable if it was developed with learners, reflecting holistic intended outcomes. However, using a checklist that learners do not know about disempowers the learner, and very much separates assessment from learning. The value of using checklists depends very much on how and why they are used. This suggests attention to the design of assessment that reflects authentic performance would greatly enhance the messages about assessment that ACTA learners receive as they undertake their assessment for these units. A more holistic approach might include learner's suggestions for what they did well, what they could improve on and how they might improve to reach the required standards. This

implicitly includes the opportunity for ACTA assessors to judge whether or not the ACTA assessee understands the standards required.

3.1.2 DACE

The documents we draw on for this section are the competency standards for the following units: “Develop curriculum and instruction for adult learning programme”, “Develop a workplace learning plan” and “Develop assessment tools”.

In keeping with a competency-based approach, the competency standards for these units are separated into underpinning knowledge and performance standards. While this allows the assessor to “see” different behaviours because they are presented as discrete entities, this separation assumes that we enact knowledge and performance separately when in fact they are deeply entwined with each other.

This aside, the DACE units provide a more cohesive approach to learning, assessment and curriculum design than was evident in the ACTA documentation. DACE units are heavily predicated on instructional design considerations. This is one approach to designing curriculum. Theorists in the field note the term “instructional design” as suggestive of an expert giving instructions, a didactic approach which the field has moved on from. However, the limitations of this approach for the design of assessment and learning for the changing nature of work are perhaps encapsulated in a range statement from the unit “Develop curriculum instruction for adult learning programme. It states there should be a “balance amongst affective, behavioral and cognitive learning”. Again this is consistent with a competency-based training approach; however, it also points to a separation of context from learning and assessment. This statement also assumes learning is individual, omitting the fact that learning could be through social interaction or interaction with tools situated in specific contexts, and could also be collective (e.g. teams and groups learn through problem-solving together). Thus the limitations of considering the only affective, behavioural and cognitive, are that the approach removes learning from authentic contexts and limits consideration of the holistic nature of performance at work.

In the unit “Developing assessment tools”, the performance statements include reference to “determining the background for the selection of the assessment tools and relevant stakeholders” and also reviewing the tools with the stakeholders. This indicates a strong need for not only liaising with stakeholders in the workplace, but also engaging in collaborative negotiations with them. The unit “Develop curriculum instruction for adult learning programme” also makes mention of stakeholder engagement for curriculum-design purposes. There is therefore quite a strong message that curriculum designers are expected to engage with the workplace, and thus for learning and possibly assessment to be authentic. What may be missing to support this message are opportunities to share how to do this and how to overcome the considerable challenges involved (see section 2.3 in Chapter 2).

The range statement (what MUST be covered but not limited to) for “Developing assessment tools” lists, among many other possible tools, work-based projects, portfolios and third-party reports. These assessment tools lend themselves to authentic work-based assessment. The authors of this report suggest that additional ideas can be gleaned from the six individual case studies on assessment and the changing nature of work. The range statement also makes mention of instruments for recording assessment (in particular, to developing recording formats for both formative and summative assessments) and also to the development of rubrics and graded assessments to assist in the making of assessment judgements. All this augurs well for supporting assessment at, through and for work. However, the tensions between the intent to support learning and assessment at, through and for work are also evident in the DACE documentation, although not as strongly as they are in the ACTA documentation. For example, reference to observation checklists and questionnaires, and structured interviews to assess competencies related to underpinning knowledge and also for assessing attitudes

and attributes, indicate an approach that favours lists of tasks and procedures. It is the relationship between the different elements listed in the performance standards, and also the underpinning knowledge, that is missing.

Perhaps this is best illustrated through noting what is not there. Notably, for a diploma-level course. nowhere is there mention of a critical consideration, analysis and/or evaluation of particular tools or approaches. It is this more abstract thinking and understanding of principles, rather than lists of specific approaches, that enables innovative, creative curriculum design that supports learning and assessment for the changing nature of work. Such approaches are likely to develop the DACE graduate's capability to make informed decisions about appropriate assessment tools and to provide a rationale for the selection of these tools, which is important when engaging in negation with stakeholders such as employers.

3.2 Conclusion and suggestions

ACTA and DACE are critical to the CET sector as they lay the foundations for the work that practitioners do. There are exciting possibilities for hard, critical discussions to explore what these practitioners need to enact SkillsFuture and to be responsive to the changing nature of work. The following specific changes are suggested for curriculum designers, programme developers and managers:

a. Develop a broader, holistic understanding of competence.

b. Ensure the new understanding addresses the integratedness of technical or vocational capabilities and ways of knowing.

c. Replace examples with those that strongly illustrate the complexity of work.

d. Give examples and stories of actual contextualisation.

e. Create opportunities to discuss and uncover how authentic, holistic, integrated learning and assessment can be conceptualised and implemented.

f. Provide principles of assessment plans rather than a step-by-step how to.

g. When using role play, provide scenarios, not scripts.

h. Ensure consistent understanding of learning and assessment, e.g. that learning is not just individual but social, not just a change in behaviour but involves the emotional and embodied (in being and becoming), cognition and context of the learning.

i. Include examples of collaborative "partnerships" or run separate courses or CPD sessions on developing, managing and maintaining partnerships, which are a key feature of workplace-based learning and assessment (Boud, 2000).

j. Develop capacity for critique and questioning.

4. Assessment Practices in the Six Cases

4.1 Introduction

In this chapter, we develop the "six dimensions of assessment" as a framework for identifying and explaining the assessment practices that we have observed in the six cases (see Table 1.1). The six dimensions of assessment were developed by moving iteratively between the data and the literature. We assume that assessment is more than "testing" or the "measuring" of learning which occurs after the fact; assessment for the changing nature of work has a focus on helping learners know how to improve, and enabling the development of long-term learning capabilities, as well as meeting the requirements of accreditation through summative assessment.

Working across the six cases, we noted that the function of assessment in the different sectors and professions is still primarily assessment *of* learning, i.e. summative assessment carried out at the end of a course or course unit to ascertain or "measure" and certify learners' achievement of learning. It functions as a formal statement of the learners' accomplishment of learning, and only informally as part of teaching. Here, summative assessment serves an important social function in endorsing professionals like fire-fighters, medical doctors and engineers, who provide crucial public services.

Summative assessment is also integral to the management system of various institutions: it has a "double function" that enables some of these institutions and organisations to rank, assign and/or reward employees/learners. This is reflected in the "place" of learning which is closely situated with and/or within the human resources department. However, we also found creative approaches to formative assessment and unlikely but exciting combinations of summative and formative assessment, along with holistic reporting formats and approaches.

The mode of assessment and learning is primarily instructor/assessor led, and learners rely on and respond mainly to their instructors and assessors, rather than relying on themselves or their peers to validate and drive learning. When there is little or no support from their teachers, learners seek, explore and experiment on their own and with their peers. While they do recognise standards and boundaries of their knowledge, these may not be consistent and/or in agreement with the instructors' and institutional requirements. However, through our research, we understand that course designers, instructors and assessors value and uphold the need for assessment to serve its certification and licensing functions, but they also express a desire for assessment to do more than just "testing", and for assessment to enable (better) learning.

Our findings are both "small scale" and "big picture": "small scale" in identifying specific challenges and suggesting/discussing possible pedagogical interventions, but also "bigger picture" in revealing the often tacit systems of knowledge, forms of knowing and what is to be achieved, as well as the messy realities that complicate different types of assessment (e.g. summative, formative assessment, sustainable). Our research approach focuses on ways in which learning and assessment are designed, experienced and put into practice. Yet learning and assessment do not exist in a social and cultural vacuum.

By taking a "bigger picture" approach that locates learning and assessment in larger contexts such as the profession, workplace/work-base and/or organisational setting and industry, as well as discourses like the iterative process of designing curriculum, we highlight the entanglement of learning and assessment with other institutional, professional and social factors. Catering to the needs of the small scale but also paying attention to the bigger picture, we deploy terms like "alignment", "feedback",

"judgement", "authenticity", "holism", and "future orientedness" as categories of analysis, which we also seek to problematise and expand upon in order to reconfigure how we might think about learning and assessment as humanly meaningful and integral to effectiveness. In this chapter we identify these terms as dimensions of assessment, hence we use this as the header for section 4.2. We conclude this chapter with the implications of these six dimensions of assessment for collaborative partnerships, as such partnerships (as indicated in Chapter 2) are necessary for assessment for the changing nature of work.

4.2 Six dimensions of assessment: an analytical framework

In developing the six dimensions of assessment, some of which have been identified as "leading practices" of assessment in Chapter 2, we draw on the data and literature to expand each dimension. Table 5.1 (p. 51) summarises the key points of each dimension.

4.2.1 Alignment

The specific examples in this section are from the workplace learning programme; they highlight the issue of alignment, which is an important aspect of assessment where instructors and course designers seek to align intended learning outcomes, learning activities and assessment tasks (Biggs, 2003), known as "constructive alignment" or the shortened term, "alignment".

Of all the six cases in this project, the workplace learning programme, which is designed to train and prepare learners to become workplace learning facilitators, has been the most explicit about assessment for "developmental purposes" rather than as "testing" of learning. It comprises assessment of learning (summative assessment) based on written report, learning journal and one-on-one interview, and assessment for learning where learners are supported by their coaches to design, implement and evaluate a "learning intervention" at a workplace. As this was a pilot, it is to be expected that discontinuities between assessment and learning will arise. So while the intention of the assessment has been explicit, and learners do value the connections made between assessment, the espoused purpose and learning, learners noted that such connection/alignment was not present part way through the course (though they might have gained a better understanding or thought differently by the end of the course):

> They did give us some training but at this point in time, I don't really see the link between that training and what we're striving for. (Harriet, learner)

Learners also reported a lack of clarity about how much detailed "evidence" and what the evidence should be that they needed to produce for assessment:

> To me, it wasn't very clear as in what kind of evidence are needed because sitting there … and also don't know how much detail is expected in that box, in the box … (I was) getting a bit worried, I said oh dear I didn't take photographs, oh dear I didn't do video recording … (focus group, learner).

While it is not unusual for learners to struggle to see the whole when they are part way through their course, confusion about what constitutes "evidence" was apparent when learners tried to clarify if it is about the activities or tasks such as diagnosing, implementing and evaluating a workplace learning intervention, or is it about their accomplishment as a workplace facilitator.

Issues with other forms of alignment also came to light. Designers, facilitators, learners and enterprise clients also express different understandings about "learning", and they take different stances from human resource development, educational and business-management perspectives, which shape their

expectations about “learning”. For example, during the presentations made by participants, one of the programme designers posed the question, “Standard operating procedures may not be what they need. What is it they really need?” (programme designer). The facilitator then asked, “Is the company getting listed as this [fulfilling ISO standards] an external driver? Needs good management documentation ... Needs standard operating procedures as this is the start of the process of differentiation …”. Here, summative assessment helps to ensure adherence to SOP and ISO requirements but this discussion presents a possibility for diagnostic and formative assessment. For example, if each of the programme leaders were to explain their different perspectives and learners asked to analyse these perspectives in relation to the enterprise issue being discussed at the time, this activity could contribute to greater clarity about the different perspectives, the language used within them and their implications. Such an approach, not undertaken in this run of the course, would deepen learners’ critical abilities and thus their ability to be innovative workplace learning facilitators.

For this programme, curriculum documentation states that assessment is for “development” and for “becoming [a] practitioner” (curriculum document). The focus on competences to be assessed are about the “doing” – diagnosing, co-creating, implementing and evaluating a workplace learning intervention – and not so much about “becoming the practitioner”, or indeed about development as it relates to “becoming”. This indicates some misalignment between the intent of the programme – which is to “optimise learning and performance gain” (curriculum document excerpt) – and the design of the learning and assessment, as indicated in Harriet’s quote above.

Learners attempt to resolve the misalignment by discoursing and theorising about “learning” where they ask critical questions such as, “What is learning? Is it something that happens solely inside the head of the individual, or is it more than this?”; “What is a learning intervention and what is not?”; and so on. Learners sought to align their (learning) experiences, which demanded they address these deeper questions. The design of learning and assessment tasks created opportunities for learners to theorise – important for these developing practitioners. It also suggests that theorising could be planned into the programme by building on this natural sense of inquiry for learners to connect the experiences gained from working with their clients with wider theories of learning, and ways of thinking or meta-thinking, and creating spaces for engagement and participation, experimentation and contemplation. Theorising can be conceived as a form of practice that can change thinking, and how that change is reflected in one’s work. Learners’ theorising can be supported through exposure to, and critical engagement with, key theoretical texts via classroom seminars, online discussion boards and writing.

On the other hand, programme designers sought to achieve alignment between the intent of the programme and the learning and assessment processes and tasks. Such approaches also develop capabilities for sustainable assessment where the components of a framework for making judgements about the work are further expanded and applied across a range of cases. All of this is possible within the programme as there is great variety in the enterprises that the learners are working with. Strategies such as “constructive alignment” aim to align the learning system with assessment tasks in which assessment is integrated into the learning system, and learners become active participants in assessing their own learning:

> Constructive alignment starts with the notion that the learner constructs his or her own learning through relevant learning activities. The teacher's job is to create a learning environment that supports the learning activities appropriate to achieving the desired learning outcomes. The key is that all components in the teaching system – the **curriculum** and its **intended outcomes**, the **teaching methods** used, **the assessment tasks** – are aligned to each other. All are tuned to learning activities addressed in the desired learning outcomes. The learner finds it difficult to escape without learning appropriately. (Biggs, 2003, p. 1)

“Constructive alignment” tell us that the curriculum, its outcomes, the learning activities (teaching methods) and assessment activities all need be aligned to each other. It highlights the need for consistency in each of the different aspects of the curriculum, including in the enacted curriculum (curriculum as it is taught). Thus, when considering assessment, curriculum designers and facilitators need to ensure all forms of assessment (formative [assessment for learning], summative [assessment of learning] and sustainable [inclusive of assessment as learning]) align with the learning outcomes/competencies and the learning activities.

4.2.2 Feedback

Feedback is an integral part of the learning process where learners are engaged in understanding how they could improve, and the strategies for moving forward. Feedback on assessment, when well designed and delivered in a timely manner, could contribute to improvement in subsequent performance. One of the main purposes of feedback is to reduce the gap between current performance and desired goal, and it requires the instructor to provide clarity about the goals, develop appropriate challenges and specific goals, and assist learners in achieving those goals. Effective feedback also promotes learner’s self-understanding, -evaluation and -regulation, and strategies such as peer- and self-assessment are commonly used in the process. Effective feedback addresses three main questions: “where am I going?” (feed up), “how am I doing?” (feedback), and “where to next?” (feed forward), and all these are not separate but “necessary characteristics” of feedback (Boud & Molloy, 2012).

Some feedback strategies include the development of (new) feedback models (Boud & Molloy, 2013), and rethinking notions of feedback beyond its role as giving information to learners “but as a co-productive process in which both students and others have key roles to play” (Boud & Soler, 2016, p. 4). Our findings show that feedback is inherently dynamic and co-productive, and we shall examine in detail the ways feedback is used and implemented in some of the cases.

In the F&B menu-change training, there are three different but intertwined purposes (of assessment) that shape what kind of feedback is given and if it is to be given at all. The three purposes are to enable accountability and compliance with company regulations; to help or enable workers improve and/or become better in their job; and the notion of “loss” of know-how and investments made in learning/training when a trained staff leaves the company. In this case, feedback might be used to communicate (to employees) the desired behaviour and corresponding rewards for performance and/or compliance, and it could also be used for learning.

In a cooking/learning session, we found feedback provided by the development chef (instructor-assessor) to be immediate and directed towards helping the cooks (learners) improve their techniques. The development chef coached the cooks by closely observing, correcting and reminding them on the spot as they were cooking, and sometimes by redemonstrating certain steps and techniques that the cooks might have done incorrectly.

The nature of feedback in the F&B menu-change training is mainly corrective – addressing techniques and specific actions – rather than explanatory. This type of feedback may be limiting in a way: learners, especially novices, may know what to do but do not necessarily understand what they are doing or realise the impact and consequence of their actions. The way current assessment has been designed is such that feedback is triggered by mistakes the learners make, and the feedback only addresses immediate and visible errors and/or actions. Any “deep knowing” could only come with further practice and experience in the restaurant kitchen, and the onus is on cooks/learners to seek feedback rather than the instructors or assessors or peers to construct and provide feedback.

Findings also show that there are multiple sources of feedback; many opportunities to give and receive feedback; and different ways to give feedback, including face to face, group and IT-enabled. In the

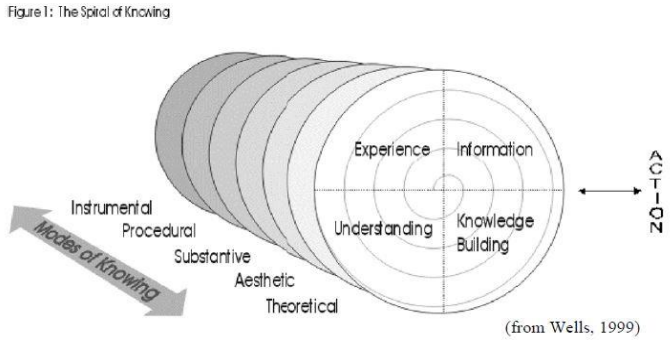
aircraft engineering programme, the students' activity of building an electric circuit provided plentiful opportunities for feedback. The instructor engages students in a continuous process of questioning that leads to their own further investigation and eventual discovery of the solutions. The instructor uses questioning and prompts to assist students in tracing their steps/procedures and lines of thought/thinking, and to get them to think analytically. Here, instructors probe students by asking questions like which "component is not working?", or "why is it not working – is the component faulty or is the connection made wrongly?". The students are required to repeatedly demonstrate the assembled circuit to the instructor, and they are encouraged to investigate, identify and rectify the problems.

Students receive continuous feedback from the instructor through their demonstration of the assembled circuit and the questioning process, and also from the worksheets, components and instruments. Students use multiple avenues to gain feedback: checking the worksheet instructions and schematic diagram, using the testing instrument to gather readings (or null readings), observing the components (e.g. an LED light), and engaging with the instructor. Observing, participating, experimenting and talking are crucial for students to complete the tasks and enable feedback. The multiple avenues for obtaining feedback constitute important features or characteristics of formative assessment. They also demonstrate what Vygotsky argued – "that a similar sort of dialogue can take place when one is alone, using the resources appropriated from engaging in dialogue with others" (Wells, 2000, p. 70).

The findings suggest that the quality of feedback/dialogue is not dependent on the number of persons, or the spread and/or variety of feedback sources. The key elements of good feedback/dialogue are "responsivity" and "the attempt to achieve enhanced understanding" in which "a structure of meaning is built up collaboratively over successive turns" (ibid, p. 16). This is demonstrated in more open-ended learning environments like the workplace learning programme, where affordances for engagement with multiple stakeholders and discourse via different perspectives enable learners to discuss and analyse issues which contribute to greater clarity about the different perspectives, the language used within them and their implications. In the process, a framework for making such judgements is being developed over time. For example, awareness of the different language brought about by different perspectives, what the ideas are behind that language and the implications of each perspective (discussed in the section on alignment) are three aspects of a potential framework or heuristic for thinking like a workplace facilitator and thus for "becoming".

Feedback can be understood and engendered as "communication" writ large: it is not limited to human-to-human dialogue but incorporates interaction with texts, artefacts, devices and so on, which together constitute a "structure of meaning" (Wells, 2000, p. 16) or network that maps both material (between things) and semiotic (between concepts) relations (see also Fischer, 2005). Feedback (theorised) as communication gives recognition to the different "modes of knowing" (Wells, 2000, p. 19) and the methods through which these modes are "best" enabled. This is illustrated as follows:

Figure 4.1 The Spiral of Knowing



The diagram above illustrates how a "growth in understanding" is spiraling and transforming (rather than the sequential and hierarchical model of learning (objectives) in Bloom's taxonomy). It shows how understanding/learning grows through the processes of "knowledge building", enabled and supported by coaching, instructional design and/or practices. For example, students demonstrated this growth in understanding over the course of their aircraft engineering programme, which culminates in the final year project. Working on a topic of their choice, students are required to demonstrate the knowledge and skills gained from the programme, and show that they "truly are an independent learner" (Module Guide, p. 1). For these students, the experience of doing the final year project turned out to be a formative learning process. It requires solving practical problems, which involves prototyping, troubleshooting and collaborating with external partners, and the development of knowledge in areas such as propulsion, hydraulics, flight systems and air law. The skills and knowledge are built up and carried across time. The idea of feedback as communication is not exclusive to people or persons but includes devices, instructional design and practices (e.g. experimentation and dialogic inquiry) and their interconnections as constituents of assessment and learning, and it privileges "knowing", which is more dynamic and constitutive, rather than the more static form of learning, which is (under)represented as "knowledge" that is "out there".

Thinking about feedback as dialogical or as a system of interactive and multi-directional flow of information that also includes responses to and from artefacts and instruments could enable a better understanding of how people/learners make use of feedback, and how it could be better transformed into learning. It expands the current notion of feedback as enabling only when "it is highly specific, directly revealing or highly descriptive of what actually resulted, is clear to the performer, and available or offered in terms of specific targets and standards" (Wiggins, 1998, p. 46 in Downing, 2015, p. 58).

Our findings do not disagree with educationist literature that the timing or timeliness of feedback and the content of feedback matter: "prompt feedback to students on both the process and product contributed to a positive result" (Downing, 2015, p. 22). Indeed, feedback on learning that is directed towards helping learners "understand how to do their work better has been shown to be more effective than rewards, praise and/or punishment" (Hattie & Timperley, 2007, p. 84). Timeliness matters because participative assessment involving dialogue between assessee and assessor(s) enables immediate application.

4.2.3 Authenticity

Authentic assessment is typically indicated by the use of "real work" activities and practices, and/or its embeddedness in a real work environment. They may also include tasks and activities based on models

and/or simulations that focus on application of concepts and skills like problem solving, trouble shooting and so on. Authentic tasks may be defined as having "real-world relevance and utility" and "appropriate levels of complexity", and may even be "generative" (Herrington, Oliver & Reeves, 2002, p. 3).

Our findings show that there are different ways in which learning and assessment practices are authentic or demonstrate authenticity. For example, learners in the rota commander course are engaged in a different but related form of real work through summative and formative simulation exercises, the workplace learning programme engages learners in "situated learning", and F&B menu-change training draws upon the resources of the professional kitchen and the expertise of experienced chefs for summative-formative assessment. In particular, the "final year project" in the aircraft engineering programme expands the idea of "authenticity" beyond the notion of "real work" that suggests application of concepts and skills, real world utility, complexity and generativeness.

The final year project in the aircraft engineering programme aims to enable students to put into practice what they have learned, and for them to demonstrate independent learning. Students are required to identify their own unique problem and the associated tasks and sub-tasks (in order to solve/address the problem). These are complex tasks that involve experimentation, product design, scale modeling, troubleshooting, and so on, which are sustained over an extended period of time, i.e. six months. One student's final year project – to repair the school's flight simulator – had enabled him to explore, discover and implement the process of troubleshooting as a methodical approach towards problems in machines, engines and/or physical structures. Students are also compelled to seek out collaboration with external resource providers and developers in the "real world" – one of the students worked with aircraft companies to acquire discarded aircraft seats in order to build a functioning aircraft cabin mock-up that is compliant with airworthiness/air-safety regulations. All these learnings, including troubleshooting and collaborating, and which the students have discovered on their own, are essential within the aircraft maintenance, repair and overhaul sector, but they also have general applicability beyond that industry sector.

Our findings also suggest that authentic assessment refers to something more than its real-work setting and work/professional practice: actors, particularly assessors, instructors and designers recognise the social dimensions of learning and assessment. These include the mutually constitutive and dialogic nature of knowledge (Wells, 1999, p. 75), the collaborative aspect of work,and the holistic or "authentic wholeness" (Ross, 1999, p. 154) of real work, although assessment documentation and design often suggest otherwise. For example, in the rota commander course, officer cadets/learners are assessed based on a checklist of tasks and scored along a five-point scale during the final exercise. However, during the final exercise we noticed how learners were taught the finer points of command and control through assessor-led demonstration and questioning, which illustrated the instructional sequence to "authentic learning" where there is some variation of "modelling, coaching, and fading" (Brown et al., in Ross, 1999, p. 154). This case illustrates how authenticity occurs "not in the learner, the task, or the environment, but in the dynamic interactions among these various components … authenticity is manifest in the flow itself, and is not an objective feature of any one component in isolation" (Barb, Squire & Dueber, 2000 in Herrington et al., 2002, p. 2).

The importance of "dynamic interactions" and "integratedness" of task, environment/setting and learners' active participation as factors enabling authenticity introduce and/or shift the framework of investigating, analysing and understanding authenticity towards teaching/learning concepts like "situated learning", "communities of practice" and "legitimate peripheral participation" (Lave & Wenger, 1991). These concepts essentially theorise and authenticate learning as a social phenomenon. They also suggest a fundamental shift in focus towards the "nature and quality of the particular activities in which teachers and students participate together, and through which learning occurs" (Wells, 2000,

p. 75). Here, learner engagement with the assessment task, scenario and/or process is emphasised and taken into consideration as an indicator of authenticity (Herrington et al., 2002, pp. 2–3).

Therefore, our findings support the notion of authenticity as extending beyond "real work": the interactions with others and the settings in which tasks take place need to capture the dynamics of the situations that learners are being prepared for. They highlight factors like situatedness, community and participation, which ought to be considered in the design and implementation of assessment for authenticity. Our findings also show that, depending on the nature of work and type of learning situation involved (e.g. workplace learning, aircraft engineering and doctor residency programmes), writing reports and reflection journals, reading, and discussion are important processes in the learners' discovery, exploration, expression and self-formation.

4.2.4 Holism

Holism aims to engender the wider ethics and values of the profession and/or occupation, integrating knowledge, skills and experience that in practice reject easy dichotomies like theory–practice, knowledge–skills, mind–body and understanding–applying. Cases like the learning of new dishes in the F&B menu-change training requires cooks to follow recipes, comply with food safety regulations and restaurants' requirements, and to ascertain and distinguish sensorial qualities of aesthetic and taste. Here, "integratedness" suggests the inseparability of learning from the learner and that which is learned, or the connectedness between doing, thinking and being. It takes into account learning as a more personal and holistic process.

Our findings show that learning and the nature of knowledge (or know-how) in most professions, ranging from cooking to fire-fighting, are embodied rather than distinct or easily separable. As a cook, firefighter or engineer, much of the knowing is demonstrated in the doing, and involves being able to put things together, solving problems, working with complexity and developing/cultivating capacities like awareness, responsiveness and fortitude. The integratedness of learning and know-how suggests that assessment should be designed holistically. Yet the design of assessment is still premised on "traditional" dichotomies of mind–body, knowledge–skills and theory–practice.

Our findings support the notion of learning as not just about acquisition of knowledge and skills, and assessment as the measurement and/or testing of this acquisition, but internalisation of the ethos and values of the profession. For example, thinking and acting like a rota commander in the rota commander course demands fundamental changes in dispositions towards danger and emergency situations, including alertness and responsiveness. It also highlights the learning of "leadership" as an embodied process enabled through observation, participation and practice, and developed over time with experience. The internalisation of ethos and values of the profession, or the mastery of know-how like "command and control" of a team during an emergency, could only be achieved over time and through meaningful engagement in work beyond the immediate course, and this mastery is also beyond a matter of technical proficiency, which often includes and embeds qualities like alertness, responsiveness and perseverance.

The F&B menu-change training illustrates "taste" as a form of knowing that is cultivated through embodied learning. Taste cannot be boiled down to categories of skill and knowledge, and its learning cannot be easily distinguishable from the learner and that which is learned. Because taste is embodied and requires learners to be able to discern for and by themselves, holistic assessment of taste, for example, aims to help learners develop judgement and foster a better understanding of what is required by making explicit and visible what those components of taste are and enhancing clarity on what those standards of taste are, and to help learners to "draw on whatever they need to continue learning

effectively beyond the end of the course and be able to make judgments about their own learning outcomes" (Boud & Soler, 2016, p. 2).

Other studies, for example of apprenticeship, have shown that being immersed in a learning environment also profoundly structures the learners' "social knowledge, worldviews and moral principles that denote membership and status in a trade" (Marchand, 2008, p. 246), apart from facilitating technical skills. In the rota commander course, learners/officer cadets are acculturated as members of the officer corps in the Singapore Civil Defence Force through elaborate ceremonies like the commissioning parade. Designing assessment holistically means that assessment outcomes, criteria and tasks, and all the other components in the teaching system, have to incorporate learners as participants in assessment (rather than as receivers of instructions, results and feedback).

Sociocultural theories of learning (e.g. Vygotsky, 1978) and anthropological research on learning (e.g. Marchand, 2008; Ross, 1999) support a more holistic view of learning as an "embodied phenomenon" that not only rejects dichotomies of mind–body, knowledge–skill and theory–practice but focuses instead on "whole-person" learning, where learning is regarded as an ongoing process of participation in relevant activities, and engagement in meaningful undertakings, rather than as a "thing", "product" or acquisition of certain "products". Therefore, holism is a perspective that focuses on the "integratedness" of learning. We are aware of the importance for "individual components" or tasks to be taught and assessed. Task-specific practice is fundamental in vocations like cooking, and what we are suggesting here is that these tasks can contribute to the overall wholeness of what is essentially a good cook, for example.

4.2.5 Judgement

Judgement is an important aspect of assessment for and as learning. It is a fundamental feature of the outcome of sustainable assessment where learners develop the ability to judge the quality of their work, understand standards and identify their learning needs (Boud & Soler, 2016). Outcomes of sustainable assessment refer to the ability of learners to make informed judgements of their own learning (sustainable assessment relies on assessors and/or learners to exercise judgement). Judgement is also an essential part of the learning and assessment process because the development and use of judgement are fundamental in enabling learners to understand their own work, and also for assessors making assessments:

> Human judgment is needed to collect and collate information, especially if – in a programme of assessment – information from various types of assessment needs to be combined. When human judgment is central in the assessment process, it may be clear that the quality and expertise of the person who is making the judgment is decisive for the quality of the assessment … in assessments involving human observation and evaluation the quality of the user is central. (Schuwirth & van der Vleuten, 2011, p. 481)

Our findings suggest that standards of "objectivity" and "reliability" are often privileged in assessment, which has led to a reliance on psychometric assessment/"measurement" methods and breaking things down into smaller components, rather than an emphasis on the connectivity of things and their integratedness or wholeness. One may argue that the exercise of professional judgement through the use of psychometric measurements gives an impression of objectivity and reliability. However, this approach can result in tensions between learning and measurement as the situation is more complex than that: course designers, instructors and assessors recognise the importance of professional judgement, but they also operate in an institutional setting which demands (public) accountability. For example, in the rota commander course, the use of a checklist as a reporting format for assessment may limit capturing holistic performance, but judgement of holistic performance was taking place. Here,

assessors have some flexibility in determining how to conduct the assessment, and this is largely determined by the nature of the exercise, whether it is a high-rise fire, oil-tank fire, hazardous material incident etc., which then shapes the assessment in terms of the emphasis on particular aspects of the job/role, and the different domain knowledge. It requires assessors to exercise professional judgement but presents a challenge to those designing assessment where consistency of standards, judgement and objectivity are sought, especially in and for a summative assessment situation. This tension between institutional demands and professional judgement of performance that is holistic is managed, in the case of the rota commander course, by course designers, coordinators and instructors being cognisant of how professional competencies such as responsiveness, alertness, awareness and decisiveness involve combinations of tasks or activities, and modes of understanding, interpreting and communicating, which can be developed only with time and experience as learners/officer cadets grow into their role as rota commanders upon graduation from the course.

In terms of learners making informed judgements about their own learning, our findings show that in a number of case studies, learners are generally dependent on their instructors and assessors for information about their learning: in the F&B menu-change training, cooks rely on the chefs to tell them if they have got the taste right (rather than determine for themselves), whether they have met the requirements and/or what they need to do in order to get it right. However, in the rota commander course, the learners/officer cadets were able to identify, assess and self-regulate their own developmental needs such as physical fitness (a fundamental competency). For example, they conducted running sessions in bunker gear after/outside of official training time, at night, in order to acclimatise their bodies to the gear and develop their fitness level. But for more complex tasks/activities such as "command and control", the officer cadets depended heavily on the assessor's judgement about their performance (as observed in the final exercises), and they responded primarily to cues from the assessor. In the certified IP associate course, learners were able to approach complex network problems and identify the issues during the course because they could judge where and how they are going in their learning through the use of a heuristic[8].

In situations where direct guidance is less forthcoming from assessors and instructors, in a more open-ended and less controlled learning environment such as in the workplace learning programme, learners were able to reflect on their own performances and experiences using summative assessment tools like the "enterprise report":

> Enterprise report is really, really comprehensive and it captures so much information ... Really, really taking a lot of time, so if you can actually fill in all these sections in different part of the report then those are the actual evidences and while we are filling out the enterprise report, the report actually forces us to go through the structured learning process. Make us think, makes us reflect on what we are doing so this is in a way is good for us but then it's quite a lot of work to do it but then it's something that will make us keep on track and make us reflect on what we are doing and see how we are doing and things like that. (Harriet, learner)

While learners were given support in writing the report, they were left to figure out how to "use" and "make sense" of the report for the development of their own learning, and to make meanings out of the writing process individually. At the same time, they developed the report together with other learners

[8] Here, the "heuristic" refers to a decision flow chart that explicates particular ways of thinking analytically. It seeks to help learners approach network problems and identify issues. It is understood by learners and instructors as a guide to decision making and pattern identification.

and “enterprise leads” or partners, which suggests the writing and the report to be a more dynamic, interconnected and co-constructed process through which judgement is formed.

Our findings also suggest that assessors and instructors exercise professional judgement during assessment which is more holistic than the exacting standards and explicit criteria written down in assessment documents and checklists – this is highlighted in the rota commander course, F&B menu-change training, and certified IP associate course. It raises questions about how assessment could be redesigned explicitly for holistic judgement, and the communication and understanding of these judgements for learners in particular:

> An important consideration is that of how performance of an assessment task is to be judged. Are explicit criteria and standards involved, or are more holistic judgments needed? Indeed, given Sadler’s work on how markers go to great lengths to avoid using criteria even when they are specified in detail (Sadler, 2009), are students being given a false indication of how work is to be judged by providing such criteria? Further, is an assessment just a paper to be handed in and marked, or does it involve students identifying and using criteria for themselves, or does it involve others (e.g. peers) in the judgment process, at least informally? (Boud & Soler, 2016, p. 10)

Judgements need to be made by assessors to determine if the competencies have been met but, unless learners have developed the capacity to make their own judgements, they could be ineffective in dealing with changing practices at the workplace.

4.2.6 Future-orientedness

Future-orientedness refers to learners’ readiness for work, and their ability to face future unknowns and new challenges beyond the immediate course/training. Findings show that institutions deal with it by designing possible scenarios using simulations (e.g. field exercises in the rota commander course) which expose and guide learners towards specific responses and “best” solutions to known and/or possible problems. In other cases, like the doctor residency programme, future-orientedness is expressed in the institution’s learning framework as “ability to adapt and innovate to solve unexpected problems using deep learning and reflection”, which highlights the preparedness of healthcare professionals to face future uncertainties and challenges. This reflects the recognition course designers, instructors and assessors have of future-orientedness as an important goal.

In practice, future-orientedness is interpreted as “forward thinking”, which means “thinking about, planning for, or considering the future, rather than just the present” (Cambridge Dictionaries Online, 2016). This is not the same as having the capacity to resolve unfamiliar problems through reflective practices, and it moves the emphasis away from reflective practices and resolution of unfamiliar problems (a key feature of future-orientedness) towards predicting the landscape of the future (we shall examine this issue of the “future” in the next chapter).

Our findings also show that the learners’ notion and timescale of what the “future” is, and their priorities about learning, are often quite different from what their institutions imagine that future to be. For example, in the aircraft engineering programme, learners raised concerns about the validity of their certificate and training for future employment. Here, the learners’ “future” horizon is the immediate three- to six-month period after graduation, where gaining entry into the industry as recognised engineers is a priority and challenge. Their future landscape is characterised by competition for work, and their anxieties about opportunities and salaries raise concerns of a systemic kind: educational inequities and social expectations rather than issues of quality or capability.

The issue of future-orientedness comes across most strongly in the doctor residency programme. It is an explicitly desired outcome of course administrators that refers to specific skills like critical thinking and communication, and broader qualities like the embodiment of ethics and professionalism. Course administrators believed that these skills and qualities could be taught and learned in enrichment-type classes and/or workshops, but practicing medical professionals like Dr Georgie, who is a senior doctor and faculty director, recognise that some of these skills and qualities could only be developed with experience and practice in the field. She highlighted how resident doctors in palliative care, when confronted with the suffering of their patients and attending ethical dilemmas, become deeply reflective of their work and responsibilities. But she also suggested that these capabilities could somehow be "acquired" through things like a "reflection course". The conundrum of medical practitioners, and gaps between course administration (seeking to apply best education/pedagogical strategies) and the medical profession, are not atypical across the cases. Problems like these are more salient in the doctor residency programme because of the complex organisational structure, where there is separation or delineation of departmental functions between human resources, course development and administration, and the teaching faculty in the programme and organisation.

Course designers and administrators who are also professionals in their field face similar challenges. For example, in the F&B menu-change training, the technicalisation of cooking into recipes, instructions and training/cooking demo session which perhaps meet business needs in terms of efficiency, does not necessarily accomplish taste as knowing which is embodied, cultivated and discoursed. Findings from the doctor residency programme and F&B menu-change training highlight the need for professionals to be able to recognise some of these conundrums and gaps, which suggests "meta-thinking" processes (see workplace learning programme), and opportunities for sustainable assessment, as possible pedagogical interventions in learning for future work and/or the future of work.

4.2.7 Collaborative partnerships

This short section briefly picks up the discussion in Chapter 2 on collaborative partnerships; as indicated in Chapter 2, these partnerships are a critical aspect of assessment for the changing nature of work. While not the focus of our study, there nevertheless was some data relevant to this aspect. Cases such as the doctor residency and aircraft engineering programmes that involve multiple parties – certification and licensing bodies, professional accreditation boards, external educational providers, employers and government agencies – complicate assessment and learning because of their different interests, demands and purposes. In the doctor residency programme, curriculum developers and learners have to balance between formative assessment (e.g. the 360-degree review or monthly performance evaluation) and summative written (MCQ) examinations such as the "training examination and board examination", which is based on the US medical system and context. The learners in the programme have three roles: a worker, a learner and an examination taker. Work is of the highest priority, followed by passing the examinations. This makes holistic learning/formative assessment least important, which then creates a number of tensions related to assessment for learning.

This is compounded by breakdowns in communication (e.g. over the aims of partnership), different understandings, complex power relations and unstable levels of trust (Reeve and Gallacher, 2005). Their interactions and relationships are important because they determine performance standards and requirements that could shape and/or provide affordances for good assessment and learning design. Hence, developing partnerships and/or collaborative working relationships is important, and it involves the process of negotiation.

A "happier" story or lesson that could be drawn from is provided by the workplace learning programme designed and delivered by IAL. Here, learners are paired up and connected with an enterprise (which has agreed to participate in the programme) to identify and develop a workplace learning solution to

meet their business needs. A relationship between the state as training provider (e.g. IAL), the business enterprise/client, and citizens/learners as learning facilitators-in-training, has provided a point of entry for the state (as provider) to identify and address issues the business enterprise faces that the state can help or give support for. While training is a state agenda to drive economic and labour transformation, it also creates spaces for negotiation and presents a new normative language of learning that introduces (potentially) new paradigms of state–citizen–business relationships and new social compacts. The negotiation process is constant throughout the time the learners, as learning facilitators-in-training, are working with business enterprises/clients, trainers and IAL programme developers. It is structured through the report (a major summative and formative assessment requirement), which has to be signed off by the business enterprise/client at each stage – a way of ensuring continuing support which also serves the purpose of keeping the learner on track, providing structured support to them as they work through the process with their coach.

The notion of multiple parties introduces new dimensions like complicated interactions and relationships, differences, and negotiation into our discussion about assessment and learning. They suggest new models (of thinking and working) like "collaborative partnership", "learning ecosystem" and so on. These models of cooperation could potentially upend and/or transform the traditional landscape, as well as understanding of, for example, educational institutions as primary owners/drivers (of learning and assessment) into "partnership", thereby enlarging/expanding the learning space, and changing educational institutions from "providers" of learning into "sites of learning". But they could also be euphemisms for business models, with further implications. Change is already in motion, epitomised by the higher education landscape elsewhere in the world with resistances to the "corporatisation" of universities (Chomsky, 2014), and articulated in a deeper reflection about the role of the university and meanings of university education and learning in Singapore (see for example Kwok, 2016). It is beyond the scope of this project to explore these dimensions but they are potential areas for future research and action.

4.3 Conclusion

Assessment as a system of performance evaluation presents opportunities for and as learning, but this requires much rethink about historical practices and ways of thinking about assessment, as well as current understanding about knowledge, work/profession and learning. Our findings highlight several challenges ahead for assessment: to address the ways one can think more expansively about and of assessment, and how to grasp the "real world" complexities. On the other hand, we also suggest certain strategies and considerations for the design and implementation of assessment to enable learning, and these will be addressed in the following chapter.

5. Designing Assessment: Six Dimensions of Assessment as a Pedagogical Intervention

We have thus far described and examined the ways in which assessment has been designed, experienced and put into practice based on the six cases. We have identified specific challenges that reveal the often tacit systems of forms of knowing and outcomes to be achieved, which require abilities such as reflecting, evaluating, problem-solving, analysing, and hypothesising/theorising (often referred to as skills) needed in most professions today and in the future. These challenges present an opportunity for interventions that bring in new tools to support and/or design assessment, for and as learning.

In the following sections, we provide suggestions for designing formative, sustainable and summative assessment using the six dimensions of assessment identified and analysed in Chapter 4. Table 5.1 describes the characteristics of each dimension for assessment design, and Figure 5.1 illustrates how these dimensions could be configured for formative, sustainable and summative assessment.

Table 5.1 Dimensions of assessment for the changing nature of work

Alignment	Authenticity	Judgement	Feedback	Holism	Future-orientation

- The intentions about assessment are explicit; - The connections between assessment, the espoused purposes and learning are clear; - Assessment captures desired qualities of performance (which is judged on whether learners have learned what they were expected to); - Assessment criteria are transparent; - The interconnections of the parts are emphasised by being assessed as a whole.	- Uses, draws on and/or is embedded in real work practices (encompasses case-study scenarios, simulations, real-work activities); - Focuses on performance in various circumstances of work, as appropriate to the scope of the learning outcomes.	- Assessors come together to develop shared understandings of criteria (what is important); - Learners are enabled to make judgements about the quality of their performance; - Variation of judgement reflects work practices but does not compromise the fundamental criteria.	- There are safe spaces for learners to perform and receive feedback from educators and peers; - There are opportunities for learners to use feedback and past performance to improve their next performance (feedback loops).	- Assessment embeds the ways of being of the occupation (including wider ethics and values of the occupation); - Provides opportunities to integrate concepts and experience, and develop language and deep understanding.	- Learners develop the ability to face new challenges and unknown future situations (beyond the course); - Learners are enabled to make judgements about the quality of their performance (moved to make judgements); - Learners develop capability in giving useful, constructive feedback; - Assessment design enables development of “meta-thinking” (Stack & Bound, 2012).

Figure 5.2 Designing assessment

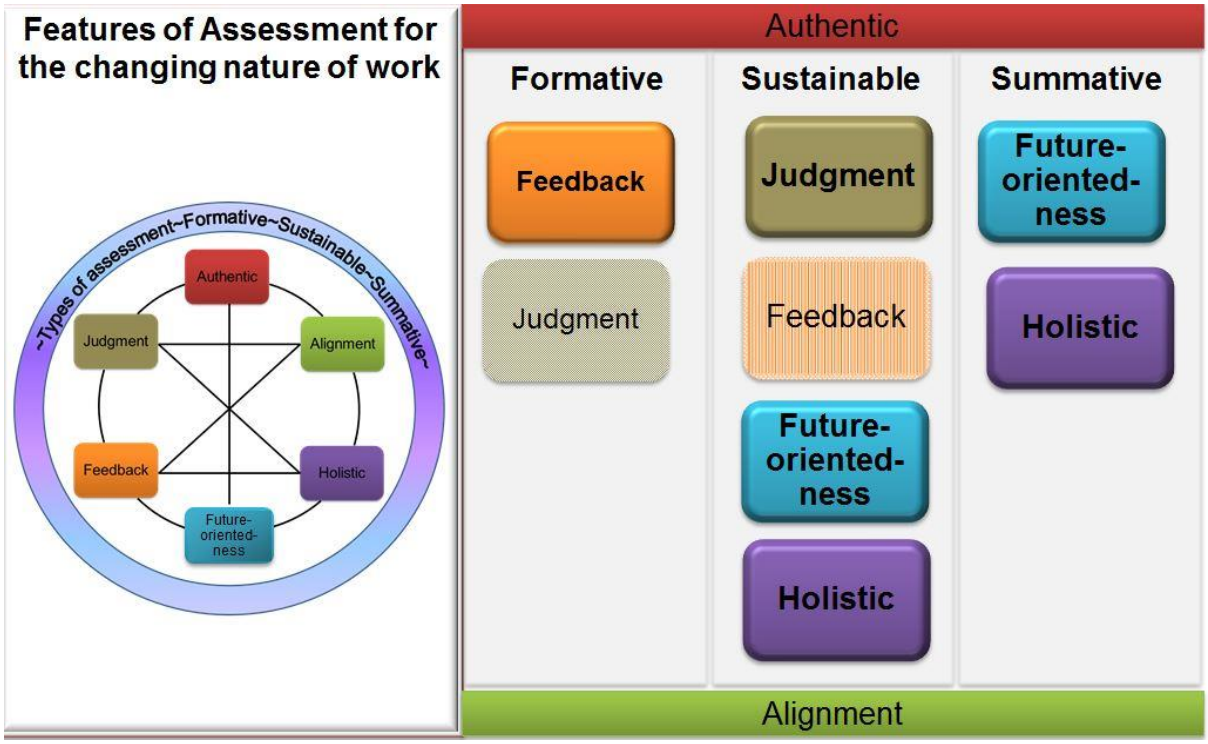


Figure 5.2 above highlights the fundamental features to consider when designing assessment. No single feature in the diagram is of greater significance than any other, or has priority, and all are necessary in designing assessment. In this chapter, we attempt to put together formative, sustainable and summative assessment approaches based on these features, which were highlighted and explained earlier in the report. Here, these features are converted into principles to be used in assessment design. The ways in which these principles are applied, organised and/or arranged affect the assessment to be designed.

Our findings suggest that the boundaries between formative, sustainable and summative assessment may in reality be blurred. But we maintain the distinction for the purposes of analysis and design, and highlight these dimensions of assessment as principles for assessment design. Hence the diagram illustrates “feedback” and “judgement” as strong or key features of formative assessment; “feedback, judgement, “future-orientation” and “holism” in sustainable assessment; and “future-orientation” and “holism” in summative assessment. “Authenticity” and “alignment” are overarching features of formative, sustainable and summative assessment. Taken as a whole, the diagram represents an iterative design process, and it functions as a prototype of assessment design that needs to be refined, evaluated and tested with new data and further research.

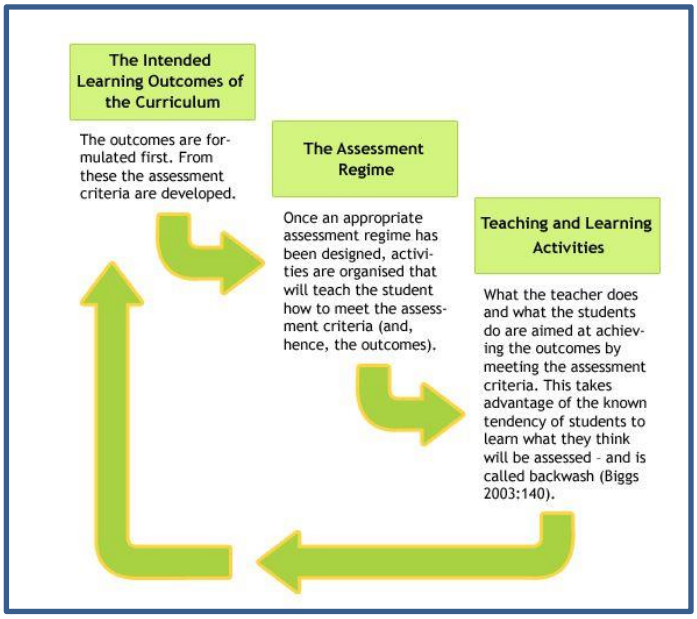
5.1 Authenticity and alignment

Authenticity and alignment are common features in formative, sustainable and summative assessment designs. Alignment enables learners’ understanding of the purposes and goals of assessment, and the underpinning idea is provided by Biggs model of “constructive alignment” (2003), which tells us that the curriculum, its outcomes, the learning activities (teaching methods) and assessment activities all need

to be aligned with each other. It means that the curriculum, instruction and assessment need to support each other such that learners are assessed based on what is taught, and what is being taught should reflect the curriculum. Alignment is an important feature especially for curriculum design, yet it is difficult to achieve in practice (Pellegrino, 2006, pp. 2–3; IAL, 2016, p. 67).

There are several models catering to curriculum design for classroom as well as workplace learning (see for example Figure 5.3). These models serve as a guide to enable alignment but complexities highlighted in the workplace learning case, for example, suggest issues such as learners' understanding and experiences, different perspectives in framing knowledge and ways of knowing (workplace learning, human resource development etc.), and business/organisational priorities and practices, cannot be ignored. In the context of SkillsFuture, IAL has begun to explore "blended learning" that integrates work, learning and technology, and where alignment between what the business enterprise wants to achieve, intended learning outcomes, training strategies and assessment is central. It seeks to "operationalise" Bigg's notion of constructive alignment with a model identifying stakeholders and critical success factors (see IAL, 2016). The main idea in these models is that assessment should be integral to curricula and instructional design (see also Boud & Soler, 2016, p. 12).

Figure 5.3 Model of an aligned curriculum for a school/classroom setting.



(Source: http://www.ucdoer.ie/index.php/Using_Biggs'_Model_of_Constructive_Alignment_in_Curriculum_Design/Introduction)

Authenticity is another key feature across formative, sustainable and summative assessment designs. It is characterised by opportunities and/or affordances for the application and recontextualisation of learning and its contribution to work improvement. Current assessment models supporting "authenticity" emphasise not only task and context but also performance that requires learners to apply combinations of aptitude, knowledge and skill in particular settings and/or work practices. These models imply or suggest integrated performance (holism) which brings together what has been learned, and they portray "authenticity" as a continuum:

Table 5.2 Authenticity continuum

Traditional	Authentic
Selecting a response	Performing a task
Contrived	Real-life
Recall/recognition	Construction/application
Instructor-centred	Learner-centred
Indirect evidence	Direct evidence

(Source: http://www.deakin.edu.au/__data/assets/pdf_file/0005/268511/AUTHENTIC-ASSESSMENT.pdf)

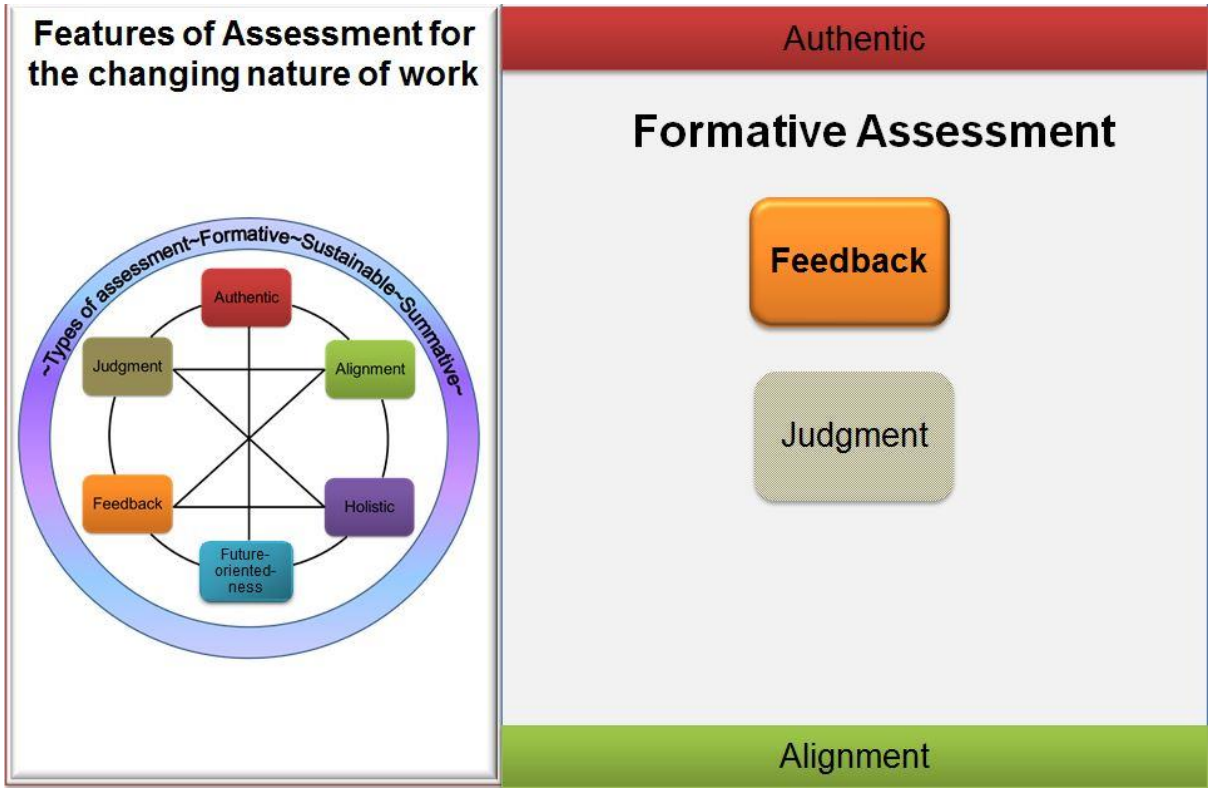
Our research findings suggest that the most important element in "authenticity" is learner engagement with the assessment task, scenario and/or process. The findings highlight "dynamic interactions" and "integratedness" of task with environment/setting as defining characteristics of authenticity. Therefore, the focus ought to be on the "nature and quality of the particular activities in which teachers and students participate together, and through which learning occurs" (Wells, 2000, p. 75). So, rather than a laundry list of features of "authenticity" or authentic assessment tasks, we suggest designers consider the following questions in relation to task, context and performance:

1. The task has to be one that involves learners in carrying out activities that reflect what is done in a work setting and/or professional practice. **What assessment tasks to do? To what extent are these tasks integrated with other aspects of work?**
2. The context suggests that assessment mirror the way knowledge, skills and aptitude are used in the work and/or professional context, which should also include things like teamwork and cooperation (where appropriate) crucial to the work and/or profession. **Where are the assessment tasks carried out, and how? Are there affordances for flexibility and dynamic changes?**
3. Assessment criteria and standards have to account for performance that reflects the value of work and professional practice. **How should performance be evaluated and judged?**

To let authentic assessment drive curricula, some assessment design models suggest designing assessment tasks first, followed by the development of a curriculum that would enable learners to complete the assessment.
(http://www.deakin.edu.au/__data/assets/pdf_file/0005/268511/AUTHENTIC-ASSESSMENT.pdf).

5.2 Designing formative assessment

Figure 5.4 Formative assessment.



Formative assessment, or assessment for learning, focuses on participants' learning, helping them to know how to improve (please see p. 11 of this report for a discussion of "formative assessment"). Feedback and judgement are key features of formative assessment design (see Figure 5.4), and this section suggests ways and/or guides to help practitioners develop these features that enable/support formative assessment.

5.2.1 Designing feedback for formative assessment

Our findings indicate that we need to think of feedback as far more than expert others giving feedback to learners, but rather as learners engaging in feedback, giving feedback, self-assessing and using feedback to improve performance. To this end, curriculum designers need to create multiple feedback loops that will enable learners to use feedback to improve their performance. The challenge remains for feedback to be given more thought and effort, to be incorporated into (the design of) a course, and how the feedback should aim to:

- help learners understand how they are progressing;
- provide clarity about standards/expectations;
- show where and how to improve;
- enable understanding of quality.

For example, the workplace learning programme demonstrates how multiple feedback loops have been designed into the course (see diagram below/following page):

Figure 5.5 Workplace learning programme – feedback loops

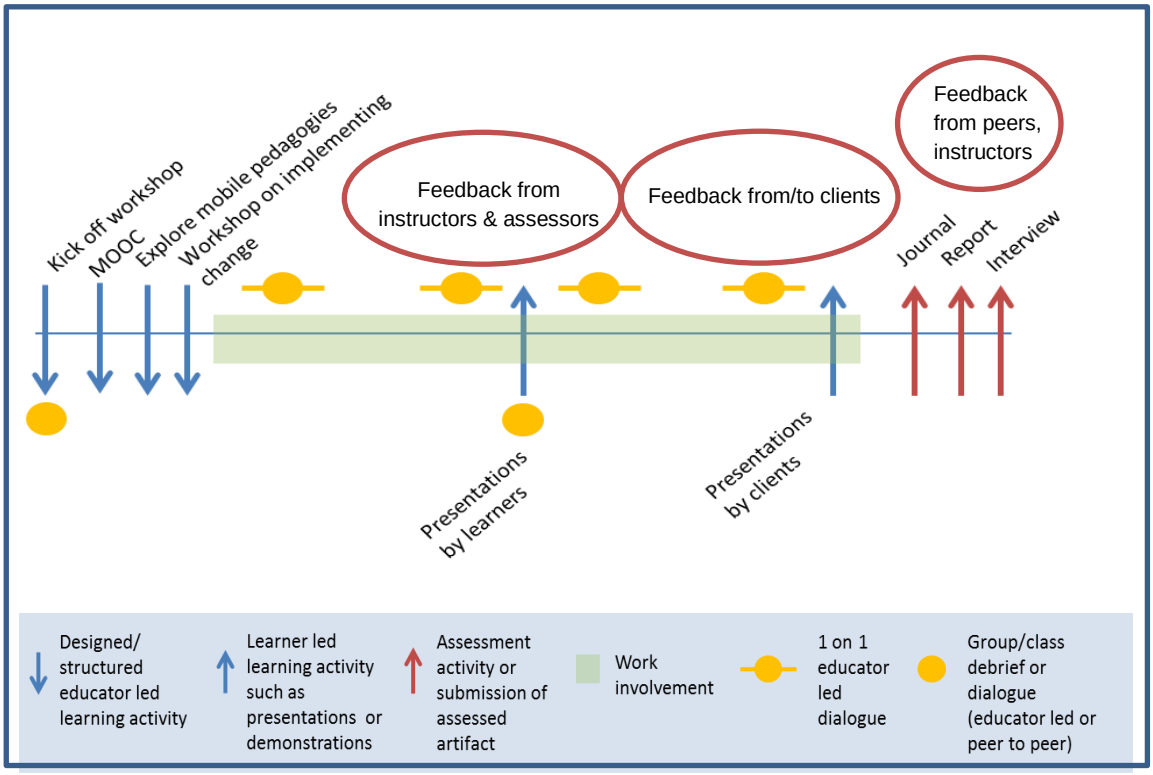


Figure 5.5 illustrates a programme design where learners are provided with many opportunities to understand how they are progressing, have clarity about what they are progressing towards in terms of expected standards, and to understand where they need to improve and how they might improve. It takes time and exposure to various experiences and examples for learners to understand the quality of expected performance. Discussion about how to interpret these experiences and examples in relation to the desired performance, including feedback from multiple sources (e.g. educators, peers, clients, supervisors, coaches, critical friends, etc.), contributes to understanding of the desired performance.

At a structural level of the programme, opportunities to give and receive feedback from self, peers and facilitators are present in the planned dialogue sessions, face-to-face workshops and presentation day. A strong point of the programme was the potential for coaches to engage in dialogue with the learners on their progress and challenges. Our data did not capture this aspect in detail (due to access and confidentiality issues), but coaches with strong theoretical understanding of the work the learners are engaged in, and equipped with a dialogical approach to coaching, would be able to set up learning conversations that enable learners to increasingly deepen their ability to reflect on their own progress. Coaches were also in a position to give targeted feedback as required, thus providing some scaffolding for the learners as they make sense while doing the work.

5.2.2 Designing feedback to enable judgement

Judgement refers to the ability of learners to make informed judgements of their own learning (sustainable assessment relies on assessors and/or learners to exercise judgement). Judgement is also an essential part of the learning and assessment processes because the development and use of

judgement is fundamental in enabling learners to understand their own work, and also for assessors making assessments. Feedback and judgement are intertwined:

> … to rethink the unilateral notion of feedback from one in which information is transmitted from the teacher to the student to a bilateral and multilateral one which positions students as active learners seeking to inform their own judgments through resort to information from various others. (Boud & Molloy, 2013, p. 699)

To develop learners' judgement for learning beyond the immediate course, and to inform their practice so that "not only do they have the capabilities to produce work that meets the standards of others, but also they can make their own informed judgments about the process of production of that work, drawing upon the full range of resources available to them" (ibid., pp. 704–705), we may consider the curriculum features in Figure 5.6.

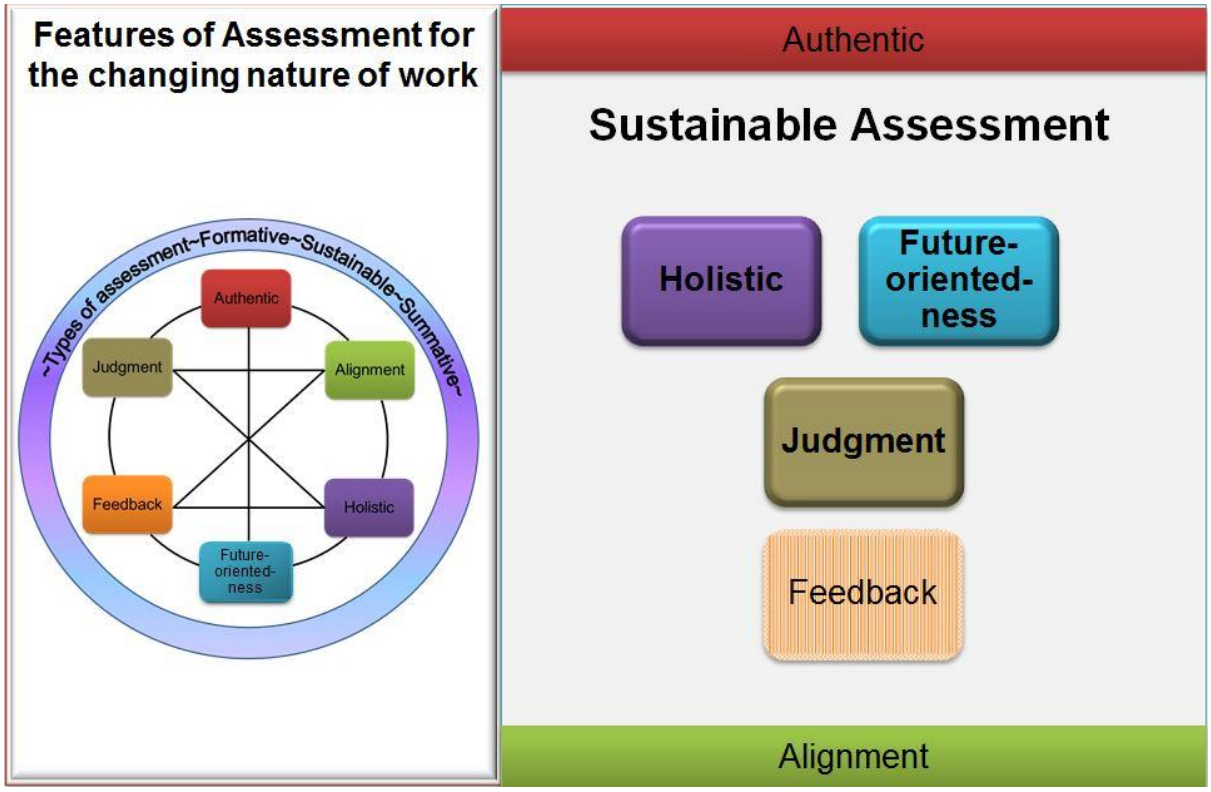
Figure 5.6: Developing judgement

Feature	Examples
Learners orientated to the purposes of feedback	Explicit learning outcomes relating to developing judgements and collaboration with peers, clear expectations that students actively participate in classes and that information received will lead to action
Learners participate in activities promoting self-regulation	Activities to build student engagement and foster self-regulation through self-testing of understanding, students reflecting on how the standard required compares to their execution of the task or planning what information they need to meet learning outcomes
Learner disposition for seeking feedback is developed	Development of feedback seeking skills through early practice activities including identification of appropriate criteria, formulating comments on others' work, practice in identifying what kind of comments are needed on assignments
Opportunities provided for production of work	Opportunities for students to produce work of the kind that is central to learning outcomes through multiple tasks well designed for this purpose, not all of which might be formally graded
Calibration mechanisms	Channels to enable learners to check knowledge sources, develop understanding, calibrate their judgement against expert work and peer work, regular opportunities to judge their own work before it is marked
Incremental challenge of tasks	Development of sequences of tasks that progressively and realistically challenge learners, assessment tasks progressively build capacity to tackle more complex problems
Nested tasks to allow for 'feed forward'	Timing and design of tasks to permit input from others (teachers, peers, practitioners and learning management systems, as appropriate) and self on each task, to be utilised to benefit performance on subsequent tasks
Learner as 'seeker and provider'	Opportunities to practice giving as well as receiving of feedback. Orientation of learners to dimensions of the target performance (they need to engage with the desired learning outcomes, so they can make and articulate a comparative judgement)

(Source: Boud & Molloy, 2013, p. 707).

5.3 Designing sustainable assessment

Figure 5.7 Sustainable assessment



> Sustainable assessment has been proposed as an idea that focused on the contribution of assessment to learning beyond the timescale of a given course. It was identified as an assessment that meets the needs of the present in terms of the demands of formative and summative assessment, but which also prepares students to meet their own future learning needs. (Boud & Soler, 2016, p. 400)

Sustainable assessment emphasises the role and purpose of assessment as enabling learning beyond the immediate course and/or training. It engenders strong features of "future-orientedness", which refers to learners' readiness for work and their ability to face future unknowns as well as new challenges beyond the course/training. Assessment needs to play an integral role in curriculum and pedagogy in order to realise the potential of sustainable assessment.

Thus in designing assessment activities, Boud and Soler (2016) highlighted some features of sustainable assessment for consideration which are summarised in the following questions:

- What particular features of the assignment and accompanying activity prompt consideration beyond the immediate task?
- In what ways does engagement in the activity foster self-regulation?
- How does the activity help learners meet challenges they will find in practice settings?

- How is engagement in the current activity likely to improve the capacity of students to make effective judgements about their work in subsequent ones?
- Are the educational benefits of the task likely to persist once the particular knowledge deployed in it can no longer be recalled?
- Does the activity enable students to appreciate, articulate and apply standards and criteria for good work in this area?
- Does the activity enable students to demonstrate those course-level learning outcomes that relate to preparation for learning post-graduation?

(Source: Boud & Soler (2016), p. 11)

In sustainable assessment, the students alongside peers and instructors/assessors are involved in a collaborative review and critical examination of their work. Therefore, sustainable assessment is a critical strategy in peer- and self-assessment techniques which aim to develop learning capabilities by enabling learners to be aware of their own learning needs, and instructors to provide guidance and the necessary skills to support learning.

Peer- and self-assessment have been used for problem-based learning, simulation and web-based learning. They are current practices or techniques that encourage self- and collaborative learning:

> Peer assessment is an arrangement when students make assessment decisions on other students' work. Self-assessment occurs when a student assesses and makes judgments about his/her own work. Peer and self-assessment are linked to reflective practice as it involves self-development and as such, is an important skill for career development and management. Students can make peer and self-assessment decisions on various assessment forms. (Hains-Wesson, 2013, p. 3)

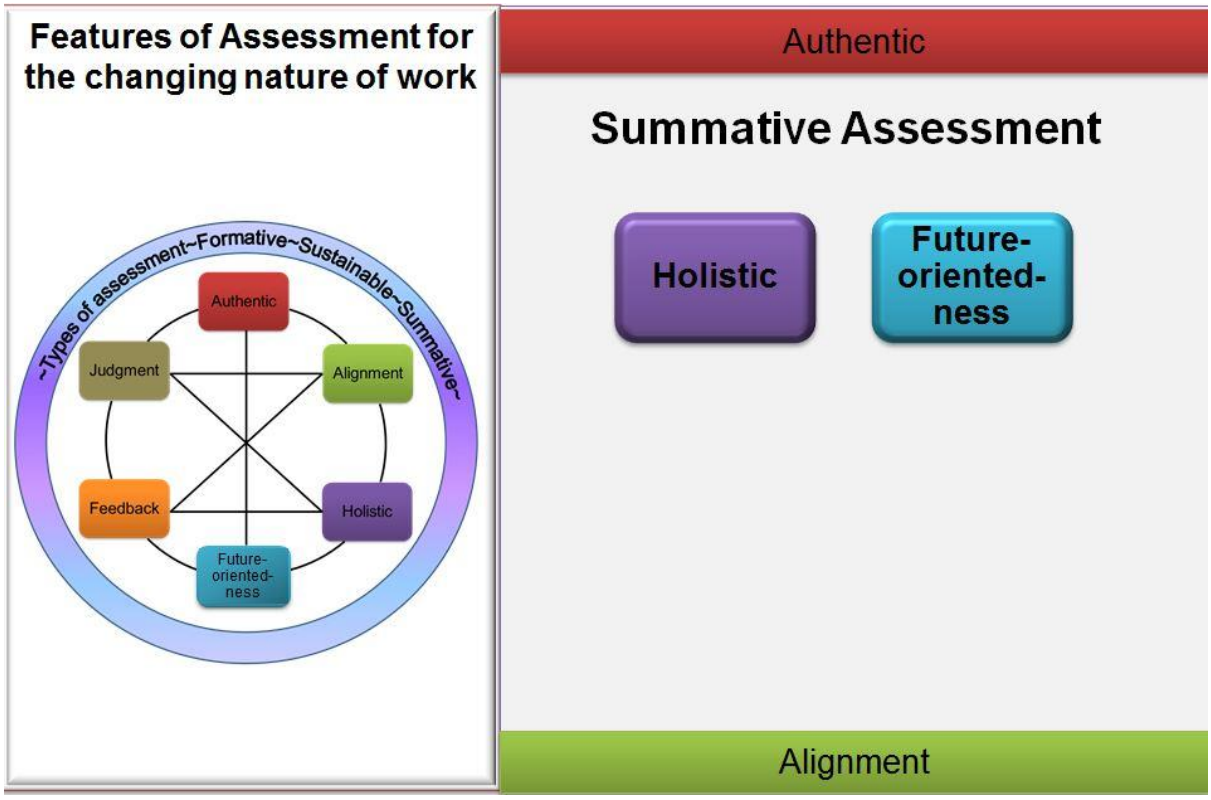
The following guidelines may be considered when designing peer- and self-assessment to inform self-judgement:

- Instructors should explicitly discuss with, and inform, students about peer-assessment expectations and objectives;
- instructors should explicitly encourage students, and provide them with the tools to give their peers positive and constructive feedback that is productive and professional;
- instructors should stress to students to be sensitive when giving feedback to their peers, illustrating good practice with examples of what constitutes a negative peer assessment and a positive one;
- peer assessment can facilitate students' personal coping skills and strategies for self-regulating learning, providing motivation and recognising progress;
- instructors should be aware that giving students too little responsibility may mean that students feel lost and unclear about what to do;
- instructors should explain the rules and process of the self-assessment activity and why it is important to both learning and real-world environments, as well as important for establishing realistic expectations;
- providing a rubric or outline for the students to follow in order to authentically self-assess their work is crucial in providing students with motivation to complete the task;
- allowing for prior formative self-assessment activities to help scaffold the self-assessment activity is important for establishing self-directed learners.

(Source: Hanis-Wesson, 2013, pp. 4-6)

5.4 Designing summative assessment

Figure 5.8 Summative assessment



The goal of summative assessment is to judge student learning at the end of a course/training session by comparing it against some criterion, standard or benchmark. Summative assessments are often high stakes and have a sense of finality. They are typically carried out in the form of examinations, final project, paper submission and/or learner's presentation.

Summative assessments can be used formatively to guide efforts and activities in subsequent courses and/or training. They can be made to enable or support "holism" and "future-orientedness" by writing learning outcomes in ways that allow and encourage "unexpected" learning outcomes (McEwen et al., 2010), incorporating those skills required for learning beyond the course/training, and developing assessment criteria and rubric that capture holistic performance. Assessment criteria and rubrics, when designed well, are effective summative assessment tools and may be used formatively.

5.4.1 Assessment criteria

Assessment criteria, or what some call success criteria, are important for making transparent assessment judgements; criteria assist with the process of making judgements for formative, sustainable and summative assessment. Criteria relate to the expected standard of performance. But standards alone are not enough – assessment criteria must reflect the nature of knowledge and the development of understanding and/or learning.

Criteria start with a verb. The rest of the criterion is similar to a learning outcome:

> The key to a well written criterion is that it works as an instruction to students, helping them to understand what they need to do and include in any assessment task (including exams) to meet expectations. When taken together as a group, the set of assessment criteria for any task could be read by anyone and they would have a reasonable level of clarity about what the task involves. (UTAS)

The UTAS website tells us that assessment criteria provide the answer to the question, "What do I have to do?", and standards descriptors (ought to) address the question "How do I do that?", demonstrating achievement of the learning outcome at different levels. There appears to be limited research on assessment criteria. However, a number of universities have developed web information on developing criteria for their staff that is also available publically. The following is an explanation of criteria drawing mainly from these sources.

Capturing the multiple dimensions of student performance is at the heart of criterion development. A range of diverse performance measures can be formulated for any given performance. Criteria are developed by analysing the learning outcomes and identifying the specific characteristics that contribute to the overall assignment (UTAS, UTS; University of Reading). The University of Tasmania (UTAS) describes criterion-referenced assessment (CRA) as follows (note the reference to grading as this is important for an institute of higher learning; however, grading is not necessary for all situations where assessment is used):

> Criterion referenced assessment (CRA) is the process of evaluating (and grading) the learning of students against a set of pre-specified qualities or criteria, without reference to the achievement of others (Brown, 1998; Harvey, 2004). The pre-specified qualities or criteria are what students have to do during assessment in order to demonstrate that they have achieved the learning outcomes. How well they do this is described at different levels – these are standards (or performance descriptors). Thus, CRA is assessment that has standards which are "referenced" to criteria.

Assessment criteria are often associated with summative assessment; however, criteria also enable formative assessment. For example:

- criteria can allow valid and reliable judgements to be made by multiple assessors;
- students can use the criteria to see how they are progressing in their assessment activity (Education Services Australia)
- criteria can be used by peers to provide feedback at appropriate points in the learning process (Education Services Australia)
- other stakeholders from teachers to workplace supervisors can also use the criteria to enter into a dialogue with learners about their progress

These forms of feedback contribute to developing learners' capability in making realistic judgements of their performance. Assessment criteria provide students with information about the qualities, characteristics and aspects of an assessment task that will be used to measure their attainment of each of the learning outcomes. Criteria make it clear to students what factors will be taken into account when making judgements about their performance (UTAS). See Appendix A for examples of criteria listed in an assessment rubric. Criteria define the characteristics of the work or performance, but they do not define how well students must demonstrate those characteristics – that is the job of the descriptors, which are also called standards descriptors. Standards descriptors are developed in a rubric.

5.4.2 Rubrics

Rubrics are not easy to design, and the use of rubrics can be problematic. Here, we assume that they are shared with students, and thus transparent (Dawson, 2015). Descriptors for levels of standard of performance vary according to the purpose of the rubric; for example:

- above expectations, meets expectations, below expectations;
- correctly and independently uses, uses with occasional assistance, uses with guidance, attempts to use; or
- when used for summative assessment rubrics may include grades such as A, B, C and D, or percentages may be allocated to each criteria, and so on.

Another alternative is described by Magin (2001) in his rubric for assessing group processes, which was scored on a 1–5 scale.

> Contributes to discussion: extent to which student took part in discussion by adding own ideas, experiences, and by taking others' ideas seriously and expanding on them.
>
> Contributes to development of the group: extent to which student fostered group development by attending regularly; supporting other members of the group; taking part in the group's activities; and performing group tasks. (Magin, 2001)

The underlined words are the criteria, and are followed by a specific explanation of what each criterion means. The details for what a one or five are, for example, is what constitutes the performance standards for each level, 1–5.

In writing performance descriptors, it is important that both descriptive and comparative words are used, that positive statements are used, and that language is unambiguous and not derogatory. The examples in Appendix A illustrate that the standards can be written to directly address the learners; that is, the descriptors are specific (minimising variable interpretations).

5.5 Conclusion

We have attempted to develop features of assessment – alignment, authenticity, feedback, judgement, holism and future-orientedness – into principles for assessment design. These features/principles are to be considered as flexible rather than immutable, and they should suggest possibilities rather than prescriptions or instructions for assessment of, for and as learning. We have highlighted guidelines, models and even resources to aid assessment design. As design principles, they seek to invoke a fundamental shift in thinking about assessment and learning, and a more reflexive understanding of what assessment and learning entail. If there is to be only ONE underlying design principle, it is the recognition that assessment has "worth", something that is essentially good and not necessarily measurable; or that it is about measuring as well as "value", or something whose worth is derived from its usefulness (assessment of and/or for learning). Whether or not assessment has "worth", "value" or both is intrinsically tied to the attitudes and meanings people attach to learning.

The assessment project sits with the SkillsFuture thrust which aims to help workers as learners become more adept at identifying and driving their own learning needs. IAL's "blended learning" initiative, focusing on the design of a blended curriculum in the context of work and learning, with the slogan "let work drive the pedagogy, let pedagogy drive the technology", is an example of such a project. In the next chapter, entitled "Shifts in thinking about assessment", we address the longer-term trends and broader thinking shifts needed, as well as the challenges that assessment highlights and/or suggests for policy making.

6. Shifts in Thinking about Assessment

6.1 Introduction

In this chapter, we discuss the broader concerns and general issues that our findings have suggested to us. We highlight "assessment dilemmas" to reflect the multiple needs and purposes that assessment has to serve, and the resulting implications for learning. They engender discussions beyond the specificity of each "case", which reveal modes of understanding, the longer-term perspectival change required, and state of preparedness for uncertainties of the future.

6.2 Assessment dilemmas

"Assessment dilemmas" are systemic symptoms of workplace learning environments caused by the dynamic interaction between different purposes of assessment and the contested meanings of assessment. For example, in F&B menu-change training, the training manager juggles different needs and priorities of the business, training/learning and cooks' welfare. The training goals and learning outcomes are conceived with fundamental business concerns in mind, including meeting customers' needs, business costs and resource constraints, and these shape learning and assessment strategies and practices. In the doctor residency programme, assessment for learning activities like chart stimulated recall and mini-CEX (clinical evaluation exercise), which use real clinical cases and incorporate activities such as reflection and formative feedback, are not well integrated with the resident doctors/learners' final certification examinations, most of which are written MCQ tests. Faculty and learners focus more on these certification examinations and regard assessment for learning activities as a formality. Course directors and instructors have also observed that learners/doctor residents with good performance do not necessarily do well in these high-stakes examinations.

Assessment dilemmas highlight the need to address complex ethical issues in assessment and learning design and practice, where decision making in one area affects and/or creates constraints in another because of the different purposes and needs of business, learning and employee welfare (e.g. F&B menu-change training), and the high-stakes examinations for certification and licensing purposes, which are summative in nature but limit formative assessment (e.g. doctor residency programme). These examples raise important questions such as how to support and drive formative assessment without compromising on the professional needs for certification and licensing purposes, or "overburdening" learners with more and more learning and assessment activities and requirements.

6.3 Expanding the horizon of assessment

Opportunities abound for assessment for and as learning. The assessment horizon could be further expanded with, for example, "sustainable assessment", and a need to create a platform for ongoing discussion and sharing of experiences among/with those who have made, or are trying to make, the shift from assessment of learning to assessment for/as learning. Course developers and planners could, for example, incorporate external reviewers or learning partners in the design and implementation phases of assessment. There could also be more opportunities for course developers and planners across different professions and industries to share and update on current practices and challenges in assessment.

Strategies like reflection (Stack & Bound, 2012) and self-assessment are key to enabling assessment for and as learning, but they need to be integrated into the work and/or curriculum or would otherwise

be self-defeating, as shown in the doctor residency programme. Strategies and tactics abound: to incorporate assessment into the teaching system (e.g. Schuwirth & van der Vleuten, 2011); the design and implementation of assessment rubric to enable assessment for learning (e.g. Maxwell, 2010); the design of feedback for learning based on ideas of "sustainable assessment" (e.g. Boud & Molloy, 2013); the enabling of "meta-thinking" described in Marzano's "habits of mind" (1992) as "mental dispositions or traits individuals can develop to render their thinking and learning more self-regulated" (Beck et al., 2013, p. 328); and so on.

Yet a more fundamental shift in thinking about assessment and learning is required which suggests neither more nor mere changes in teaching/learning activities. There is a need to address the state of understanding of learning and assessment before obsessing over what (new) processes, procedures and programmes to develop and implement as "solutions" for/of a generic and uncritical notion of learning and assessment. For instance, learning needs to be understood as a deeply situated and enculturating process that socialises learners into communities of professionals and/or practitioners:

> Particularly influential has been the work of Lave and Wenger. They originated such crucial concepts as "communities of practice" and "legitimate peripheral participation". For them, learning is not the acquisition of products, whether propositions or skills. Rather, they understand learning in relational terms as the process by which the learner comes to be able to function appropriately in a given social, cultural and physical setting. Thus, learning is "situated" in a network of relations that constitutes a framework of participation. This network transcends individual participants. So for them, learning is not a thing located in individuals' heads, or even bodies. Rather, it is an essentially social process. (Hager, 2013, p. 90)

Expanding the assessment horizon must mean widening an understanding of learning as simultaneously social and personal formative processes rather than discursive and discrete functions.

6.4 Theoretical shifts and discourses of learning

Our discussion about assessment for and as learning thus far suggests a profound theoretical shift in learning:

> With the emergence of new – social constructivist – theories on learning and the notion of competencies as outcome indicators of the educational process, the call for radical changes in the way we set up and use assessment is heard in the literature (Boud, 1990; Brown, 2004; Shute 2008, van der Vleuten & Schuwirth, 2005). This was a highly needed antithetic movement against the traditional approaches. (Schuwirth & van der Vleuten, 2011, p. 478)

The shifts in perspectives about learning, broadly, and assessment, more specifically, as something done to learners, and as classifying, ranking and ordering learners, towards assessment as fostering learning, and learning beyond the course, are firmly rooted in contemporary 20th-century discourses of education and learning. Learning could no longer be conceived as just preparing students/learners for an economically productive/useful life. The foundations of this "new" promissory discourse lay in ideas of education as learning how to live practically and independently in one's current environments (Dewey, 1938), how to participate as a members of one's community and change the nature of social order if necessary (Counts, 1932), and how to think critically and become "conscientised" (Freire, 1972) in order to take ownership, responsibility and action for one's own (learning) needs.

Current assessment and learning strategies embody values of this educational discourse that seeks to develop aware/conscientised, independent and active learner-citizen-workers who contribute to society;

the call for “judgement”-based assessment and learning indicates recognition of a shared human capacity to know, to do and to relate without relegating such responsibilities to detached tests or methods (of assessment and learning) cloaked in “objectivity” and/or “reliability”. The goal of “future-orientedness” (for assessment and learning) highlights the profound challenge of preparing learners/ourselves for the uncertainties of the future (see later section, “Preparedness for the ‘uncertain’ future of work”), which is driving the shift towards a more learner-centric approach that makes ethical as much as economic sense, and where learning is envisaged to be more widespread and self-directed.

David Boud’s work on “sustainable assessment” is an extension of all these fundamental shifts in educational and learning perspectives, and it contributes to the idea of learning as empowering, enabling and enlightening. The discourse of sustainable assessment (Boud & Soler, 2016) as “educational intervention”, “assessment reforms” and “assessment discussions” (ibid, p. 12) provides potentially productive cultural resources to shift thinking and understanding (apart from economic, instrumental and bureaucratic rationalities) that might intervene in learning and education on the levels of curriculum and assessment design, motivation, and ideology.

6.5 Assessment as medium for change: a long-term perspective

Assessment as learning, while aligned with the national policy and vision of “lifelong learning”, is a longer-term goal that needs the right conditions and support to flourish. For instance, participation is a key factor in assessment as learning, where learners learn to recognise how they are learning, take responsibility for their learning, and continue to learn beyond the immediate course/training. Learners need to be respected and considered as equal partners rather than as customers or passive recipients in the assessment and learning process, and assessment needs to change from being a deterministic high-stakes practice to a more constructive and enabling one. Assessment as learning is premised upon the notions of empowerment, independence and autonomy embedded in and enabled through learning, but does not compromise on excellence, mastery and quality of learning.

Transforming assessment of learning into assessment for and as learning requires a shift in focus from what trainers do to what students learn; from what inputs are made into the education/learning process to what outcomes or effects come out of the process; and from what has been learned to what is needed to support or sustain future learning. Educators, curriculum developers, assessors and learners themselves are all involved in helping the learner master (basic) disciplinary knowledge and skills as well as develop the awareness, disposition and conscience to “thrive” in the world.

The fact that educational reformists such as David Boud and education critics like Ken Robinson (2010) continue to highlight the gap between learning through the formal education sector and “thriving” in the world suggests that assessment plays a role beyond instituting change in learning practice. The success of assessment as learning is simultaneously indicated by and hinges upon more fundamental shifts in institutional and societal values and expectations. Following Vyogtsky, Wells wrote: “For it is in the formation of individual’s identities and dispositions through their collaborative engagement with others in worthwhile and intrinsically motivating activities … that we can most effectively make these the values of the wider society” (Wells, 2000, p. 75).

The incorporation of assessment for and as learning into the education/learning system potentially engenders wider societal change such as that suggested by Vygotsky, engendering policy makers who are able to recognise and continue to support as well as manage a broader shift in thinking and perspective. For example, shifting the idea of “vocation” and “vocational education” from a model of education that emphasises a highly technicalised and decontextualised notion of “skill” to new understandings of skill as embodied learning, personal formation, systems of knowledge and forms of knowing. These are perhaps better expressed, understood and conceptualised as “practice” or “practice

as action; practice as structure – language, symbols and tools; practice as activity system; practice as social context and practice as knowing" (Hager, 2013, p. 94), as is highlighted in professional cooking/F&B menu-change training.

These new understandings (about skill for instance) have been enabled by anthropological studies of apprenticeship (e.g. Marchand, 2008) and professional practices such as physical therapy (e.g. Ross, 1999), which debunk preconceived and received notions of vocation as "low"- or "high"-level skill, and as a binary of skill versus knowledge. Scholars show that "skilled practice is a hard-earned cognitive achievement" (Marchand, 2008, p. 266), and how "cognitive studies, neurosciences, philosophy of mind and ethnographic fieldwork are providing fresh insights into embodied ways of learning and knowledge" (ibid).

6.6 Preparedness for the "uncertain" future of work

We have attempted to highlight, describe and problematise assessment and learning as interlinked, evolving and dynamic concepts of "alignment", "authenticity" and so on in order to help better understand the complex needs and challenges of preparing workers to become (lifelong) learners for changing futures. While there may be many variations, interpretations and pronouncements about what those futures may be, the element of uncertainty is a common one.

We have observed how current strategies such as "assessment and learning" are designed to produce specific responses and "best" solutions for known, imagined and/or imaginable futures (e.g. the use of simulation in the rota commander course), and how being "future-oriented" also implies predicting the landscape of the future (e.g. doctor residency programme). The current framework of understanding, systems of education and plans of action to deal with uncertainty situate the locus of learning and assessment in the realm of performance and effectiveness, with some considerations of equity and concerns of human nature. This perhaps feeds into the continued demand for learning and assessment to be measurable and hence driven by psychometric scores, statistics and rankings upon which status and recognition are conferred, and taken as indicators of success in the education system.

These measures attempt to make visible, tangible and predictable what are really dynamic, relational and susceptible aspects of learning, and they tend to serve governance and management purposes more than learning ones. One of the effects of all these is the way learning expectations have been internalised as primarily from the school experience, where classroom delivery is dominant (Bound & Lin, 2011a), academic achievements are emphasised, and how it makes demands on learners that are different from later work experiences. The systemic disjuncture is observable in the aircraft engineering case where Da Wei, the programme coordinator, succinctly surmised how "it is a Singaporean student perception that a degree is everything (but) the reality is that attitude is everything". It resonates with the view of prominent commentators such as the former Chief Editor of the *Straits Times*, who observed that "the most important characteristics of an education system lie outside the formal structure that comprises the curriculum, pedagogy, textbooks and examinations" (Han, 2016).

Thus, learning and assessment ought to be conceived as part of human nature and capacity (encapsulated as sense-making, judgement and perception), and connected to the workings of social practice (including issues of responsibility, power, and equity). Some of these aspects are highlighted in each case as challenges and/or resistances to easy dichotomies like theory-practice, atomisation of know-how into knowledge and skills, and distinction between learning and the learner. More concretely, our findings show how learners are being prepared for the uncertainties of work, and how efforts to engender preparedness highlight learning and assessment as an ongoing process, responsive to complex contexts in terms of the nature of work, organisational and institutional settings, and systems of learning and knowing.

6.7 Conclusion

We have sought to highlight the broader issues here: the systemic and ethical concerns resulting from the way in which things are highly interconnected, or how decisions made in one area may affect and/or limit another; the shifts in thinking about the role of assessment in learning that are required; and the need to pay attention to the meaning and worth of learning in the changing nature of work. Here, follow-through to practice has to occur: the Skillsfuture initiative, focusing on the institution of learning targeted at individuals and organisations, is a comprehensive programme in which assessment has a crucial role to play. It is ongoing work in order for assessment (of/for/as learning) to be fully realised, and we shall explore some of these initial steps in the following chapter.

7 Recommendations

7.1 Introduction

The analytical framework of our project and perspectives about assessment are deeply aligned to the SkillsFuture thrust which "at its heart, it is not an economic programme. At its heart, it is about helping every individual push their potential through life" (DPM Tharman, Budget 2015). Faced with a changing socioeconomic context where work becomes more uncertain and even precarious, workers would need to become more adaptable and be able to continuously discover and learn for themselves. Learning as a national strategy is a central feature of the SkillsFuture thrust and we believe that assessment can be an enabler of learning. But there are fundamental challenges to overcome in order to enact the desired forms of and attitudes towards learning as articulated by DPM Tharman, and for assessment to do its work to support and enable learning.

First, there is a need to shift and/or change the way workers, learners, employers, educators and instructors understand assessment and learning: we need an understanding that there is an intrinsic worth in learning besides material gains (promotion, pay raise, productivity). Workers and learners are encouraged to be self-responsible, premised on more participatory ethics which oblige or allow the worker/learner to question and challenge, and make his/her own decision in a responsible manner. Therefore, a more expansive understanding of work, professional knowledge and critical perspectives other than a market-based or market-driven one are also required.

Second, more than just "getting incentives right" such as SkillsFuture Credit, current efforts are also directed at improving communication to build awareness and enhancing engagement to outreach and/or ensure standards by examining new ways to work with training partners, businesses, and education and training institutions. This raises a fundamental and perennial question about the position of the state: whether it should take an "activist" role to drive changes in the learning landscape; let training organisations, professional bodies and business corporations do the job; and/or a combination of both. It highlights an opportunity to consider alternative models of work and learning, including "collaborative partnership" and/or other institutional forms.

Third, a long-term perspective of learning is required. The change in understanding (about learning and assessment) is fundamentally social and cultural rather than procedural. But the conditions for change are already there: Singapore has a strong work ethic; there are state goals to achieve economic inclusion and ensure access to learning resources and opportunities for workers to reskill and/or upskill; and there is a pragmatic balance between state and market forces. To build on these strengths, further efforts and resources can be directed towards supporting structured programmes that are based on new assessment practices. Here, IAL's "Learn@Work" programme is an example of an experimental and collaborative approach towards work and learning. But there is also a corresponding need for a system to track, review and evaluate the effectiveness of such "new" approaches for accountability purposes.

In the following section, we make specific recommendations whose rationale is partly based on the feedback gathered from a focus group workshop held on 21 September 2016. Participants included educators from IHLs and ITE, adult educators, training providers, and policy makers. We highlight and address some of the potentials here.

Specific recommendations

Recommendation 1: That ACTA and DACE (courses that prepare CET professionals for work in the sector) incorporate the dimensions of assessment for the changing nature of work model.

Chapter 3 illustrated that the two key courses that prepare practitioners for the CET sector (ACTA and DACE) are partially reflective of the assessment for the changing nature of work, and that, for there to be consistency within each of ACTA and DACE and also to deepen practitioners' capabilities in the field, the following is suggested:

1.1 That IAL can look into incorporating in courses that develop CET professionals (particularly in ACTA and DACE):

1.1.1 the practitioner's role in working and negotiating with employers;
1.1.2 the purposes, processes and responsibilities for assessment; and
1.1.3 capabilities in developing collaborative partnerships.

1.2 Reconsider the design of units relating to assessment in ACTA and DACE to:

1.2.1 ensure there is consistency in documentation, learning activities and outcomes;
1.2.2 build in the dimensions of assessment (authenticity, alignment, judgement, feedback, holistic and future-orientedness);
1.2.3 broaden the range of tools for learning and assessment beyond role play (ACTA);
1.2.4 include development of the capabilities to critically analyse and evaluate assessment tools and approaches;
1.2.5 move away from reporting formats framed as observation checklists, questionnaires and structured interview for assessment, and towards reporting formats and assessment activities that reflect holistic, authentic assessment principles;
1.2.6 consider reporting formats that are useful for work, e.g. competent to work without guidance, competent with some guidance, competent with considerable guidance OR able to develop assessment plans and approaches independently, capable of managing others to develop assessment plans and approaches, capable of educating others, etc. This latter approach may require a separate programme.

Recommendation 2: That Institute of Adult Learning (IAL) and Skillsfuture Singapore (SSG) work with providers to require and develop capabilities in developing collaborative partnerships.

The literature and our data illustrated that assessment for the changing nature of work and implementing authentic learning and assessment requires partnerships between employers and providers and, in some instances, other bodies such as professional and licensing bodies etc. IAL could work with relevant divisions in SSG to address some of the concerns that were voiced during the focus group workshop for more flexibility in the way assessment for accreditation and QA processes are being done, e.g. we could explore how the six dimensions of assessment design (see Figure 5.1) can be integrated into some of these processes. IAL could also work with the respective agencies/departments to reexamine funding models to see what enables or limits implementation of the six dimensions of assessment design.

Recommendation 3: Enabling a more critical perspective and reflexive understanding about assessment and learning within the CET sector.

Current assessment practices do not necessarily reflect the complexities and nuances of work and learning requirements. Singapore's initial foray into assessment of work and learning (via national programs like ACTA and DACE) drew reference from assessment at school. The initial ideas and frameworks about assessment (e.g. norm and criterion referencing, standard assessment tools, etc.) were perhaps "transferred" into assessment at work. While assessment performs a crucial public function for certification and quality assurance via "testing" and "measuring" a degree of conceptual and technical know-how, current (assessment) practices tend to serve some jobs and sectors better than others. Vocational occupations in sectors like manufacturing, retail, food and beverages etc. are underserved by some of these approaches and learning strategies. Problems associated with "authenticity" (please see pp. 46–47 of this report) thus arise and they signal broader perspectival changes about learning and assessment, and better understanding of the context of work, professional knowledge and practices in relation to learning and assessment.

With the notion of "changing nature of work", educators, curriculum designers and policy makers need to take a reflexive stance to relook at assessment and ask themselves why assess in the first place, and hence, the changing purposes/roles of assessment:

> Assessment should fit the purpose/role – we no longer want to assess just to prove a level of skill attainment for measurement or verification purposes, we want to assess for job readiness, or job performance over a period of time, or in-depth grasp of a new skill for example, and the different purposes would shape the design of assessment. Then, to take it one step further, assessment's role at work could take on a different tack, because done right, assessment has the potential to contribute to a person's growth at work, so it can be an aid to skills deepening and more importantly, the being and becoming of a worker as he moves through his job. Assessment then has a dual role – for "assessment" (fit for purpose) and then "growth". (Renee Tan, Deputy Director, LPDD)

Here, seminars, workshops and practitioners guide for AEs and training providers can be planned and organised based on the six dimensions of assessment design (see Chapter 5 of this report) to further the discussion and enhance the continuing professional development of CET practitioners.

Recommendation 4: Key challenges and potentials for future research

The focus group workshop on 21 September 2016 brought educators, training providers and industry experts to discuss assessment for the changing nature of work. Our research and findings formed the basis as well as material for discussion. Participants not only provided new insights but also highlighted challenges and opportunities for the way future research might be strategised.

Prof. Lim Y. K. (Air Transport and Training College), who was one of the participants at the workshop, succinctly highlighted the challenge posed by technology at one of the table discussions. He said:

> Technology is doing the opposite of what the assessment project is doing – it is disassociating the mind and body. The intent of mechanization e.g. McDonalds is to reduce the skill to as low as possible. But it is neither a good nor bad thing, it depends on how the human race respond to it and how society evolves.

David Kwee (Training Vision) added: "

> Technology in the context of training de-segregates the knowledge from the skills because training has traditionally focused on the skill to operate the piece of machine or technology for example, and it negates the fact that the learner needs to have some underpinning knowledge

> in order to operate with the knowledge in a different context. One may be able to operate the machine but if something unpredictable happens, then it would call upon the underpinning knowledge, attitude, response to crisis, and so on. The notion of embodiment or the "whole aspect" and how to assess this embodied whole rather than the parts comes into play but it is a complex issue altogether.
>
> In addition, the shifts from "knowledge" into the "knowing" and "doing" and by the "doing" to distill what the learner might have known, that is the space where I think it provides hope for assessment. Here, if everything aggregates into the "doing" then it becomes a learning as well as assessment artifact, so the question becomes how do you design this kind of learning at the workplace? And that is a challenge we are all confronted with not just as "deliverers" of training but as "designers" of learning and performance facilitators.

In the IT network engineers case, we highlighted how the training provider focuses on "ways of thinking" with strong features of "authenticity" by drawing heavily on work-based practices, problems and varieties of complexity to develop learners' confidence to meet challenges in the field of network engineering. Examples like the IT network engineers showcase how training and assessment could be thought about and developed in other ways for practitioners and providers in the CET sector. There is also potential for further collaboration among training providers and industry professionals to design and deliver new programmes across many other fields. Here, we will continue to refine the six dimensions of assessment design and we will work with LPDD to develop and/or incorporate them into IAL's learning programmes.

The discussion between Prof. Lim and David Kwee also suggests that challenges such as the nature and role of technology in assessment and learning present opportunities for future research. It points to a dynamic research agenda that integrates several aspects of the IAL Research and Innovation Division's current research thrusts, including "Skills Strategies & Utilisation", "Blended & E-Learning", "Adult Learning" and "Workplace Learning". We will highlight the potential and share some of our ideas through "practice notes".

7.2 Conclusion

Participants from the focus group workshop on 21 September 2016 concur in principle with our findings and understanding about the current state of assessment, and the value as well as importance of assessment doing more than just testing knowledge and/or measuring learning. They adopt different positions as educators, training providers and industry partners but generally recognise the need to develop deeper capabilities in assessment in relation to "change" caused by technology and globalisation that are continuously shaping and changing the nature of work. They offer candid and refreshing perspectives suggesting, for example, that the response to these dynamic conditions could perhaps be a matter of "building on" the current capabilities of workers rather than outright change:

> You don't get a new aircraft every year. You get a new aircraft only every ten years. The aircraft technology evolves slowly but the number of people working on the aircraft, the technicians and engineers working on the aircraft don't change overnight. And more importantly, they "add on" to their skills and not "minus" their skills, so it is not so much about changing skills, it is additional skills and layered on. (Prof. Lim Y. K., Air Transport and Training College)

We will work with relevant stakeholders to further develop and incorporate assessment thinking and design into their learning programmes, and continue to engage with our partners in the CET sector.

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Appendix A

University of Tasmania

http://www.teaching-learning.utas.edu.au/assessment/writing-assessment-criteria/writing-standards-descriptors-for-rubrics

Second-year Engineering

ILOs: apply the mathematical formulation of the basic laws governing laminar fluid flow kinematics and dynamics and be able to discuss the assumptions that underlie them (criteria 1 and 3); apply dimensional analysis to given engineering situations, and apply dynamic similarity laws to scale models and full size components (criterion 1); describe fluid flow around engineering shapes, including the phenomena of boundary layers and wakes, and calculate their lift and drag characteristics (criteria 2 and 3)

CLOs: numerous CLOs refer to teamwork and communication skills (criterion 4)

Criteria	HD	DN	CR	PP	NN
Demonstrate and apply theoretical and practical knowledge of Fluid Mechanics and related engineering principles to design a marine vehicle (30%)	Demonstrate and apply *comprehensive* knowledge of maritime fluid mechanics and hydrostatics when *thoroughly discussing and describing* the *main* concepts and features related to the design. Make *meaningful assumptions* and *correctly calculate all* of the expected	Demonstrate and apply *broad* knowledge of maritime fluid mechanics and hydrostatics when *discussing and describing* the *main* concepts and features related to the design. Make *relevant assumptions* and *correctly calculate* the expected parameters	Demonstrate and apply knowledge of maritime fluid mechanics and hydrostatics when *discussing and describing most* of the concepts and features related to the design. Make *assumptions* and *calculate most* expected parameters and variables, *justifying* their use and outcomes.	Demonstrate and apply *basic* knowledge of maritime fluid mechanics and hydrostatics when *discussing and describing some* of the concepts and features related to the design. Make at least *half the required assumptions* and *calculate some* of the expected	Demonstrate *partially-developed* knowledge of fluid mechanics and hydrostatic, and *state* concepts and *describe* features related to the design. Make *insufficient or wrong* assumptions and *partially* calculate *some* of the expected parameters, *occasionally justifying*

	parameters and variables, *thoroughly justifying* their use and outcomes. *Support all* your work with *extensive, relevant and current* literature, *link all* of your design and development work to *relevant* fluid mechanics theory and maritime industry practices.	and variables, *justifying* their use and outcomes. *Support* your work with *relevant* and *current* literature, *link most* of your design and development work to *relevant* fluid mechanics theory and maritime industry practices	*Support most of* your work with *relevant* literature, *link some of* your design and development work to *relevant* fluid mechanics theory and maritime industry practices.	parameters and variables, partially *justifying* their use and outcomes. *Support* at least *half* of your work with literature, *link some* of your design and development work to fluid mechanics theory and maritime industry practices.	their use and outcomes. *Partially link* to *some* fluid mechanics and engineering practices.
Solve problems in the construction and testing phases of the marine vehicle (30%)	Communicate and work *effectively* in a team and as a leader to *efficiently* plan and conduct the project to achieve *all* stipulated goals. Solve problems in the construction & testing phases to: provide accurate, innovative and practical solutions, devise a *detailed* and *correct* testing schedule and conduct *correct, complete, and safe*	Communicate and work *effectively* in a team and as a leader to plan and conduct the project to achieve *all* stipulated goals. Solve problems in the construction & testing phases to: provide accurate and practical solutions most of which are innovative, devise a correct testing schedule and conduct correct, mostly complete, and safe	Communicate and work in a team and *occasionally* as a leader to plan and conduct the project to achieve *most* of the stipulated goals. Solve problems in the construction & testing phases to: provide accurate and practical solutions, devise a testing schedule and conduct correct and safe testing of the vehicle, and successfully develop a	Communicate and work *regularly* in a team to plan and conduct the project to achieve the *some* stipulated goals. Solve problems in the construction & testing phases to: provide some accurate and practical solutions, devise a testing schedule and conduct safe testing of the vehicle and at least half of this is correct, and develop a partially	Work *mainly* as an *individual.* *Partially solve problems* in the construction & testing phases to: provide inaccurate and/or incomplete solutions, conduct incorrect, unsafe and incomplete testing, and develop a vehicle that meets a few of the operational specifications.

	testing of the vehicle, and *successfully* develop a *working* marine vehicle that *meets all* and *exceeds some* operational specifications.	testing of the vehicle, and successfully develop a working marine vehicle that meets all operational specifications.	working marine vehicle that meets most of the operational specifications.	working marine vehicle that meets at least half of the operational specifications.	
Analyse results to justify assessment of marine vehicle's performance (20%)	Thoroughly and methodically analyse data/results by: comparing all of the predicted and actual performance of the vehicle to accurately assess how well it meets the operational specifications clearly justifying your judgments by referring to relevant and current literature, theory and calculations.	Methodically analyse data/results by: comparing most of the predicted and actual performance of the vehicle to accurately assess how well it meets the operational specifications justifying your judgments by referring to relevant and current literature, theory and calculations.	Analyse data/results by: comparing most of the predicted and actual performance of the vehicle to accurately assess, for the most part, how well it meets the operational specifications justifying most of your judgments by referring to partly relevant literature, theory and calculations.	Analyse data/results by: comparing at least half of the predicted and actual performance of the vehicle to assess how well it meets the operational specifications justifying at least half your judgments by referring to some literature, theory and calculations.	Analyse some data/results.
Communicate in a team in writing in the form of a technical report (20%)	Communicate *concisely* and *coherently* in a *structured* and *readable* report that adheres to the *given format.* Include *comprehensive*, *fully detailed, and*	Communicate *concisely* and *coherently* in a *structured* and *readable* report that adheres to the *given format.* Include *detailed and correct sketches* and	Communicate *coherently* in a *structured* and *readable* report that adheres to the given format. Include *correct sketches and CAD drawings* that	Communicate in a *structured and readable* report that *largely* adheres to the given format. Include *sketches* and *CAD drawings* that	Present information.

	correct sketches and *CAD drawings* that *make it easy* to comprehend the construction and layout of the vehicle. Present data in a format that is *easily interpreted* because it: is neat, clearly, and accurately sorted and labelled uses clear, concise and accurate legends and units	*CAD drawings* that *make it easy* to comprehend the construction and layout of the vehicle. Present data in a format that is *easily interpreted* because it: is neat, clearly and accurately sorted and labelled uses clear, concise and accurate legends and units	*assist* in comprehending the construction and layout of the vehicle. Present data in a format that can be *interpreted* because it: is clearly and accurately sorted and labelled uses clear and accurate legends and units	*assist* in comprehending *most* of the construction and layout of the vehicle. Present data in a format that can be *interpreted* because it: is sorted and labelled uses accurate legends and units	

University of Tasmania

http://www.teaching-learning.utas.edu.au/assessment/writing-assessment-criteria/writing-standards-descriptors-for-rubrics

Post-Graduate Higher Education

ILOs: design constructively aligned units where the intended knowledge, skills and understandings are clearly and appropriately communicated, taught, and assessed (criteria 1 and 4); use higher education theory, literature and practice to make and support arguments for teaching (criteria 2 and 3).

Criterion	High Distinction (HD)	Distinction (DN)	Credit (CR)	Pass (PP)	Fail (NN)
1. Develop a learning activity in line	You clearly and succinctly described your learning activity including any	You described the key details of your learning activity and supporting	You described a learning activity. You discussed the	You described a teaching activity. The activity appears	You described elements of teaching. The

with the UTAS blended learning model and constructive alignment (30%)	supporting resources. You explained the function of the activity within the unit/curriculum in relation to the UTAS blended learning model and constructive alignment.	resources. You explained the function of the activity within the unit/curriculum in relation to the UTAS blended learning model and/or constructive alignment.	UTAS blended learning model and constructive alignment and the activity appears consistent with both.	consistent with the UTAS blended learning model and constructive alignment.	activity was unclear and/or inconsistent with UTAS blended learning model and/or constructive alignment.

2.