ASSESSMENT FOR THE CHANGING NATURE OF WORK:

RESIDENT DOCTORS

Millie Lee
Annie Karmel
Arthur Chia
Helen Bound

December 2016

institute for adult learning singapore

Centre for Work and Learning

Publisher's note

The views and analysis presented in this document are those of the authors as researchers. The contents are intended for discussion and generating ideas, and are not necessarily the views or policy prescriptions of the Institute for Adult Learning or the Government of Singapore.

This publication should be attributed to Institute for Adult Learning (2017). *Assessment for the changing nature of work: Fire-fighting: Resident Doctors.*
Millie Lee, Annie Karmel, Arthur Chia and Helen Bound.

Published by the Institute for Adult Learning, Singapore
Research and Innovation Division

CWL

Centre for Work and Learning (CWL) is a research centre of the Institute for Adult Learning. CWL specialises in research on continuing education and training system design and practices. Our research employs a range of methodologies designed to deepen understanding in the challenges and opportunities for learning and development in and across different settings, particularly in relation to work and work environments.

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

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

CWL-2017-04

Contents

Figures and Tables

Preamble

This is ONE of the six cases on assessment practices and the changing nature of work, undertaken by the Centre for Work and Learning (CWL). Each of the six cases highlights different aspects of innovative approaches to assessment, their possibilities and the challenges involved in assessment for, through and at work. Each case suggests different strategies, tasks and/or practices in assessment that can enable **meaningful** and **engaged learning.**

Figure 1: Learning and assessment are entwined

Source: http://www.123rf.com/phot_3706214_stock-

In this case study, we examine the training and assessment practices of resident doctors at one of the major public hospitals in Singapore. The resident doctors are enrolled in a three-year internal medicine programme, which is a common basic programme that prepares them for the senior residency programme. This case reports on the tensions between the programme's formative and summative assessment practices. While formative assessments are intended and designed for developing holistic performance outcomes beyond technical aspects of doctor competencies, summative assessments are certification examinations mainly focused on testing knowledge with multiple choice questions. Due to strong emphasis on summative assessment, developing holistic competency becomes less important and formative assessment becomes a burden to the learners who are also full-time doctors with work responsibilities. These findings show the importance of strong alignment between formative and summative assessment, which has critical impact on the quality of learning.

We think of assessment not as the "test" of what has been learnt at the end of a learning programme, course or set of experiences, but as **judging performance**. We go back to the original meaning of assessment which is "to sit beside". This means that we can think of assessment as working *with* our learners to guide them to meet the required performance. If we understand assessment like this, then learners also need to understand, to know what that desired performance is. In other words we do not hide from them the criteria or expected performance standards. So in other words we are talking about formative assessment – assessment *for* learning. We also acknowledge that assessment *of* learning – summative assessment – is necessary for accreditation and certification. The question is how we weave these two forms of assessment together. Examples are provided in some of our six case studies. We also discuss this in detail in our full report:

"Assessment for the changing nature of work", available at <url>, as are copies of the other case studies.

In addition to summative and formative assessment we introduce another purpose of assessment – sustainable assessment. Sustainable assessment equips learners not just for meeting, but preparing them for what might be required in the future, beyond the course and/or training. It includes "the capacity to evaluate evidence, appraise situations and circumstances astutely, to draw sound conclusions and act in accordance with this analysis" (Boud & Soler, 2016, 402).

These three purposes of assessment and the fact that we investigated assessment in the light of the changing nature of work, mean we also need to think of learning and assessment differently. Assessment serves different purposes including the testing of knowledge and learning yet "testing" need not be the sole purpose. When we think of assessment as only a test of the learning and/or

something that happens (sequentially) after the learning, then we are separating assessment from learning and ignoring the fact that learning and assessment are very much in a “dialogic relationship” or **entwined together.** Figure one metaphorically illustrates this entwinement.

In the case studies, we describe what the course/programme/training is about and examine assessment in relation to curriculum design, implementation and the ways in which understanding, accomplishment and performance are achieved. We hope the case studies provide a glimpse into the different ways assessment has been carried out in design, planning and implementation for practitioners, researchers and policy makers. We hope that they highlight possibilities and contribute to new ways of thinking, designing and implementing assessment of, for and as learning. Different conditions and situations (context) will offer different kinds of opportunities for meaningful assessment.

The six case studies are:

- Workplace learning facilitators
- Firefighting: Rota commander course
- Menu change in the food and beverage sector
- Resident doctors
- Aircraft engineering programme
- IT network engineers

1. Introduction

This report looks at the assessment design and practices of the three-year residency programme for internal medicine resident doctors. The programme prepares learners for the senior residency programme covering fifteen medical specialties such as general internal medicine, cardiology and dermatology. The resident doctors are required to do seven core postings and can choose two to three elective postings from different specialties during the residency period. Based on their experience with these postings, they decide which specialty they are going to choose for their senior residency; it then takes another two to three years before they become a specialist.

The nature of the residency programme is an authentic work-based training programme where participants are employees and learners at the same time. The programme uses both formative and summative assessment with a strong feature being that many of the formative assessment activities are closely integrated with the actual work offering learners feedback for improvement. Another innovative feature is that the formative assessments use descriptors instead of grades or scores to assess competencies in different areas as well as overall progress of learners. Descriptors provide useful information to learners and potential employers as well. Despite such assessment features to enhance the quality of learning, the assessment practices and the usage of the results present challenges and tensions that are likely to hinder learning.

In this case we examine the different features of the assessment design and structure in this programme as well as practices on the ground in order to understand those challenges and tensions. We also analyse the underlying intent of various assessment elements and compare the intent with practices (to the extent that our data permits). Our analysis of the programme with its complex learning and assessment system is based on limited information available. We used document analysis and conducted three qualitative interviews for this study: Georgie shared with us her story as a senior doctor and faculty director; Nadia as a programme manager; and Tammy as a programme administrator. While Nadia oversees the residency programme at the institutional level setting policies and processes, Tammy provides administrative support to Georgie and her faculty members including collecting and managing training and assessment records. However, in this case we made a decision not to interview learners or observe any of their learning or assessment activities due to the time required to gain ethics approval through the institution.

The following section presents the overview of the programme, which is followed by the comparison of the official intent and how it is related to the assessment design. The subsequent section explores the details of different assessment components for and of learning. Finally, we discuss the tensions arising from the challenges and contradictions discovered through our analysis, and conclude with possibilities for the future.

2. Internal Medicine Residency Programme

This residency programme was introduced in 2010 as a major reform of graduate medical education in Singapore. The previous programme, the Basic Specialist Training (BST), adopted the UK system and the trainee doctors were accredited with Membership of the Royal Colleges of Physicians of the United Kingdom. In 2009, the Ministry of Health Singapore (MOH) approached the Accreditation Council for Graduate Medical Education (ACGME), the accreditation body for doctors in the US, to take over the accreditation of all graduate medical training programmes in Singapore. This was the first such case in the world and the MOH's impetus to this reform was the need to implement a more standardised, structured and competency-based training and assessment system across different hospitals (Khoo et al., 2014). Although this reform has replaced the UK system with the US one, the residents are still required to pass Membership of the Royal Colleges of Physicians of the United Kingdom (MRCP(UK)) examinations as well as the ACGME examinations during the residency programme. With this reform, the ownership of the programme has been moved from the MOH to the three major public hospital groups in Singapore which are the sponsoring institutions of the residency programme. This study was carried out at one of these institutions.

Doctors in the programme can be either medical officers who have just finished internship, or experienced doctors who have been practicing in the field. Participants in the programme are called 'residents'. The following explanation from Tammy (programme administrator) describes where this residency programme sits in the entire medical education system of Singapore.

> *In Singapore doctors who graduated from medical school can choose not to apply for a specialist training. When they graduate from medical school they are required to undergo housemanship training for one year. After they finished the housemanship, which is a scored internship period, then they become medical officers. If they choose not to pursue specialist training, then they can choose not to apply for a training program. Otherwise they will apply for training program and if they are matched to the program, they are called residents until they graduate and ready for independent practice as specialists. (Tammy, programme administrator)*

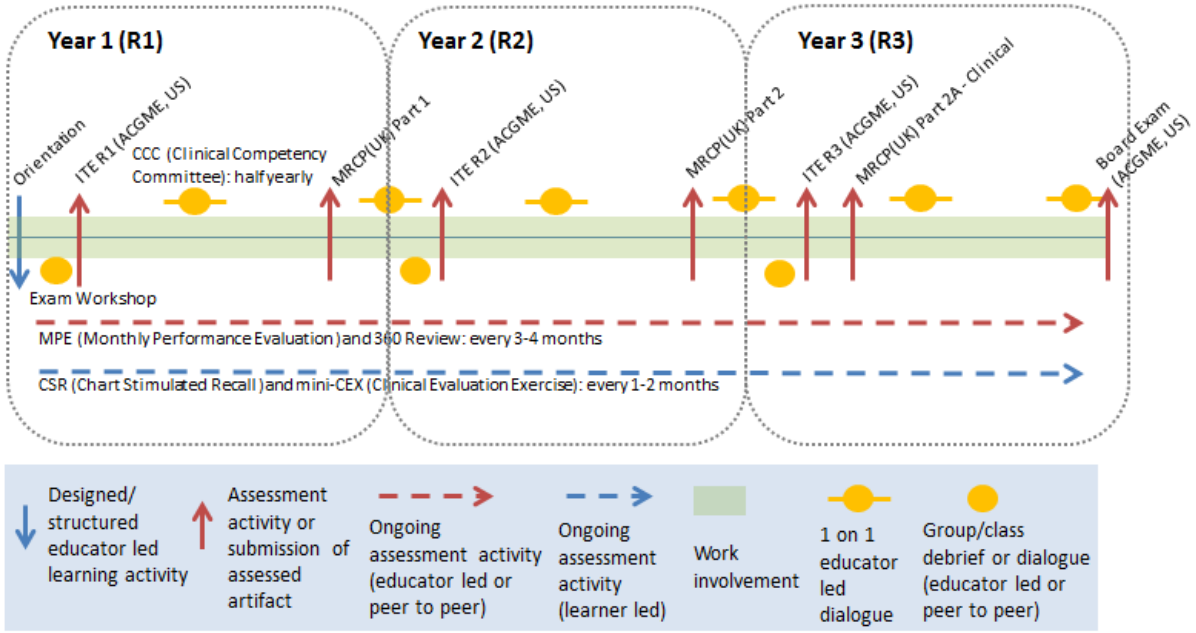
When residents first enter the programme, they attend orientation for a week to become familiar with the work, and training and assessment system of the residency programme. After the orientation, residents undertake a series of comprehensive and structured assessment activities throughout the three-year period, following the guidelines and requirements of the Accreditation Council for Graduate Medical Education International (ACGME-I)[1]. A strong focus is placed on summative assessment from the US-based ACGME such as In Training Examination every year and Board Examination at the end of the programme. The residents have to sit for additional examinations to qualify for Membership of the Royal Colleges of Physicians of the United Kingdom as well.

The diagram in Figure 1 below illustrates the design of the entire programme showing critical learning and assessment activities and processes. The diagram shows the exam workshops conducted prior to each In Training Examination to prepare the residents for the examination. We do not have access to the data with exact details, but we understand that there are other workshops with different purposes such as learning and teaching throughout the residency programme. In order to have more

[1] ACGME International (ACGME-I) is the international extension of ACGME's accreditation model, which was started with the initiative by the Ministry of Health Singapore in 2009 and its first pilot project was in Singapore in 2009.

focus on assessment practices, we do not discuss those workshops in this paper and have not included them in this diagram.

FIGURE 1: INTERNAL MEDICINE RESIDENCY PROGRAMME DESIGN



***Acronyms:**
R1, R2 and R3: Residency Year 1, Residency Year 2 and Residency Year 3
ITE: In Training Examination
MRCP(UK): Membership of the Royal Colleges of Physicians of the United Kingdom
ACGME: Accreditation Council for Graduate Medical Education

3. Intent and Its Relationship to Assessment Design

Many official documents indicate that the residency programme is intended to help the residents develop competencies that enable lifelong learning and holistic performance beyond technical knowledge and skills. In this section we examine the relationship between intent and its alignment with assessment design. The international accreditation body, the Accreditation Council for Graduate Medical Education International (ACGME-I) explains the importance of holistic outcomes in the statement below:

> *Being a doctor today brings complexities not faced by physicians in times past. Information and evidence for how we help our patients keeps growing; technologies urge procedures never possible before; the list of treatments available grows longer…In essence, physicians who train in an accredited program should be assured that by training in such an environment they will be able to serve society's needs in a patient-centric fashion. Habits inculcated during residency, such as life-long learning and professionalism, are just as important outcomes as is an accumulation of knowledge. The "end product" is physicians who serve society with an allegiance to patients, a true sense of vocation, and a commitment to quality care and caring. (ACGME-I, 2016)*

The last sentence captures the 'essence' of what it is to 'be' a senior resident. The aims of the programme are also captured in language such as 'patient-centric', 'life-long learning' (in light of ongoing technological changes) and 'professionalism'. This is important as it demonstrates that considerable thought has gone into capturing what the programme designers want their doctors to 'be' as a professional senior resident. However, in contrast to the high level of professionalism, the use of the word 'product', when referring to learners, seems to imply that learners are regarded as passive objects not actively involved in their own learning, but something that is created by the teacher. This is in tension with the concept of the capacity for lifelong learning, which is learner's ability to learn independently and is developed by active involvement of learners throughout the learning and assessment process (Boud, 2000). On the other hand it is also possible that the writers of this statement inadvertently used the language from traditional paradigms of thinking about learning and assessment that is at odds with the rest of the statement.

The importance of holistic outcomes is clearly reflected in the six competencies from the Accreditation Council for Graduate Medical Education International (ACGME-I): patient care; medical knowledge; professionalism; interpersonal and communication skills; practice-based learning and improvement; systems-based practice. For example, the minimum competency requirements for the competency 'professionalism' below show that residents are required to demonstrate their occupational values and attitudes, not just technical or procedural skills:

- Accepts responsibility and follows through on tasks (does so willingly; industrious; complete tasks carefully and thoroughly)
- Responds to patient's unique characteristics and needs equitably (provides equitable care regardless of patient culture, disability or socioeconomic status)
- Demonstrates integrity and ethical behaviour (patient before self; addresses ethical dilemmas; takes responsibility for actions)

Developing the six competencies is the major part of the programme objectives, in addition to obtaining the Membership of the Royal Colleges of Physicians of the United Kingdom (MRCP(UK)) qualification. There are five programme objectives which capture both technical and people expertise, and place a focus on passing the examinations:

- To enable the resident to acquire, through experiential learning and structured guidance, the knowledge and skills needed to diagnose and manage the wide variety of clinical problems. *(Related ACGME-I competencies: patient care, medical knowledge, practice-based learning and improvement)*

- To enable the resident to demonstrate patient safety awareness, quality improvement, sound clinical reasoning and decision making through clinical teaching, interactive tutorials and case studies. *(Related ACGME-I competencies: patient care)*

- To create awareness of the relationships and interactions of the various components within the healthcare system and enable the resident to function in a complex system. *(Related ACGME-I competencies: interpersonal and communication skills, systems-based practice).*

- To educate and evaluate the resident in a graded manner to achieve proficiency in the six ACGME-I competencies.

- To prepare the trainee for the various components of the MRCP or equivalent postgraduate examinations, so as to ensure that the trainees obtain their postgraduate membership qualification at the end of the 3 years of residency.

The ACGME-I competencies include in-depth knowledge and skill, soft skills and an understanding of the system in which residents work and direct patients to, indicating holistic learning and assessment design. However the last programme objective makes specific reference to processes around examinations to ensure that postgraduate membership qualification is attained. This explicit statement is interesting, as it immediately highlights a focus on the process of getting learners through the examinations. We discuss this further in the next two sections.

Lastly, residents are constantly assessed on the six competencies as part of their monthly and half-yearly performance evaluation during the residency programme. Besides the six ACGME-I competencies, the residency programme uses the RIME (Reporter-Interpreter-Manager-Educator) framework to evaluate the resident's 'overall clinical competence' at different formative assessment activities in this residency programme. The descriptors of RIME are listed below.

- Observer[2]: Observes only or unable to offer meaningful or reliable report (this is the pre-reporter status)

- Reporter: Able to report reliably on what is observed/gathered. Answers the "What" questions.

- Interpreter: Able to synthesize and analyze information gathered appropriately, needs prompting for solution. Answers the "Why" questions.

- Manager: Consistently proposes reasonable options/solutions incorporating patient preferences. Answers the "How" questions.

- Educator: Consistent level of knowledge of current medical evidence; can critically apply knowledge to specific patients. Takes an active role in educating others.

[2] Observer refers to "a student in pre-reporter status" (Battistone et al., 2001, p. 6).

According to the programme administrator, Tammy, RIME "*is used to help senior doctors make holistic sense of the resident's performance*". RIME is a framework describing and assessing the progress of medical students' learning, which was developed by Dr. Louis Pangaro in the US more than three decades ago and has been widely used since then. Its use of descriptors instead of numeric grading in assessing learners has been recognised by many medical researchers to be more reliable and valid than numeric grading (Battistone et al., 2001).

We note however, that in reality the six competencies and RIME seem to generate some tensions. For example, the summative assessment, which is the highest priority to both the faculty and residents, is not strongly connected to the formative assessment. As a result, formative assessment often becomes a burden and formality. In the next two sections we discuss more detail of how different assessments are connected (or disconnected) and the effect on the quality of learning.

4. Assessment *for* and *of* Learning

The residency programme is described by Tammy (programme administrator) as "*the first program to incorporate assessment into the medical pedagogy as an evaluation of and feedback mechanism to residents*". As indicated in this remark, the programme has a comprehensive assessment system with both formative and summative assessment. Figure 2 shows the details of different types of assessments in the residency programme. This section explores each of these assessments and their link to the residents' learning. We use the framework of 'assessment *for* and *of* learning' to understand the intended purposes of the assessments.

4.1 Assessment *for* learning

Formative assessment is intended *for* learning and performance improvement. There are two types of formative assessment in the residency programme depending on whether the learner plays an active role or not. For instance, with Chart Stimulated Recall and mini-CEX (Clinical Evaluation Exercise), residents play an active role and are more involved in the assessment process. Chart Stimulated Recall is a monthly one-to-one oral examination session where the assessor asks the resident about the real patient case handled by the resident to assess thinking processes and the application of medical knowledge by probing for reasons behind the diagnoses or treatment details. Mini-CEX (Clinical Evaluation Exercise) is observation of the resident's interaction with a patient at a real work setting and different assessors focus on different skills each time.

Assessment *for* learning

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).

FIGURE 2: DETAILS OF ASSESSMENTS IN THE RESIDENCY PROGRAMME

	ACGME-I							***MRCP(UK)***	
	CSR	**Mini-CEX**	**360 Review**	**MPE**	**CCC**	**ITE**	**Board Examination**	**Part 1 and 2**	**Part 2A**
Purpose	Formative	Formative	Formative	Formative	Formative	Formative -> Summative	Summative	Summative	Summative
Method	Oral questioning (on real patient cases)	Clinical performance	Evaluation by 5 co-workers	Evaluation from CSR, Mini-CEX and 360 Review results	1:1 performance review from MPE and 360 Review results	MCQ (Multiple Choice Questions)	MCQ (Multiple Choice Questions)	MCQ (Multiple Choice Questions)	Clinical performance
Frequency	Monthly	Twice for each posting (= twice every 3 months)	Once every posting	Monthly	Half yearly	Annual (total 3 times)	Once (at the end of the programme)	Twice (learner's own choice of time)	Once (learner's own choice of time)
Results Usage	Compiled into MPE	Compiled into MPE	Compiled into MPE/CCC	Compiled into CCC, used by MOHH to determine bonuses	Factor for hiring decision later	Remediation plans, used as programme's Key Performance Indicator (KPI)	ACGME Certification (requirement to qualify for senior residency programme)	MRCP(UK) Certification	MRCP(UK) Certification
Learner Roles	Active participant	Active participant	Not involved	Not involved	Passive participant	Passive participant	Passive participant	Passive participant	Passive participant

***Acronyms:**

CSR: Chart Stimulated Recall
Mini-CEX: Clinical Evaluation Exercise
MPE: Monthly Performance Evaluation
CCC: Clinical Competency Committee

With Chart Stimulated Recall and mini-CEX (Clinical Evaluation Exercise), residents are able to select the focus of the evaluation as well as the case. Also, they decide when and where the assessment takes place. During the assessment, they are engaged by answering questions verbally or performing the tasks. Immediately after the assessment, they are given feedback on their performance by the assessor and discuss action plans for improvement. These formative assessment processes strongly support learning, position the learner as active and responsible for their own learning and also provide feedback to facilitators and assessors of learning.

In contrast, in the 360 Review and Monthly Performance Evaluation, residents are not actively engaged. The 360 Review on the resident's performance is conducted for each posting by five different persons who are working with the learner: for instance, peers, seniors, junior or nurses. Monthly Performance Evaluation is the monthly overall assessment on clinical work performance of the resident, which reflects the evaluation results from Chart Stimulated Recall, mini-CEX (Clinical Evaluation Exercise) and 360 Review. Though Monthly Performance Evaluation is intended for formative assessment, in reality it is used as summative assessment; it is used to determine residents' performance bonus. Naturally such an impact is likely to influence the residents' attitude towards Monthly Performance Evaluation, which is then regarded as an assessment *of* learning, not *for* learning.

Notably, the feedback collected through the 360 Review or Monthly Performance Evaluation is not usually shared with the residents immediately. The feedback and results from those assessments are compiled for the half-yearly performance appraisal, which means that in most cases the residents would not have opportunities to improve their performance before the end of the posting; hence the immediate feedback loop is broken. This is because each posting is three months on average and residents receive feedback for their performance for the posting only every six months.

The half-yearly performance appraisal is called Clinical Competency Committee report which is described by Tammy (programme administrator) as below:

> *We collate all the evaluations that are done on these residents and we see whether these residents are progressing through what we are expecting of their level of training. If not, then the committee will recommend a remediation plan; it can be a repeat of a posting or being assigned for closer supervision or counselling by the faculty, yeah. That's how we track the resident's progression from one point to another point. If they have not reached the level that is expected of them, they will be held back or if we don't think that it is clinically safe for her or him to progress to the next level. (Tammy, programme administrator)*

The Clinical Competency Committee report comprises three parts: qualitative comments, action plans and charts. According to Georgie (senior doctor and faculty director), qualitative comments are most helpful to the residents. In contrast, the charts showing how residents fared among the same cohort have been criticised by various stakeholders of the programme. We discuss the tensions related to this in detail in the following section.

The resident plays a rather passive role in Clinical Competency Committee just like in the 360 Review and Monthly Performance Evaluation. Most assessment activities are performed by others and the resident is engaged only at the end of the Clinical Competency Committee session, when the resident establishes the action plans with the assessor as a response to the feedback given. Two issues are raised by Georgie (senior doctor and faculty director) on the action plans. Firstly, while some assessors engage residents in setting up plans, others do not engage residents at all. Secondly, the content of the action plans is problematic as Georgie cited, "*a lot of times the action plan focuses on knowledge, picking up new skills and*

preparing for exams." That is, it focuses on technical skills or multiple choice questions (MCQ) scores, not on enhancing learning in a more holistic manner, as set out in the programme aims and competencies.

4.2 Assessment *of* learning

As explained in earlier sections, the summative assessment consists of two certification examinations: the Accreditation Council for Graduate Medical Education International (ACGME-I) and Membership of the Royal Colleges of Physicians of the United Kingdom (MRCP(UK)). Most of these written examinations test medical knowledge using multiple choice questions (MCQs) except for Part 2A of (MRCP(UK)), where residents are tested on their clinical performance. In Training Examination is taken by the residents every year starting from one to two months into the programme. At the end of the residency programme, residents are required to pass the Board Examination to qualify for the senior residency programme. In the case of the MRCP(UK), it has three parts: Part 1 and 2, which are usually taken towards the end of the first year and the second year respectively; Part 2A, which is often taken either at the end of the second year or the beginning of the third year.

Assessment *of* learning

Assessment *of* learning refers to summative assessment, which is the dominant way of assessing in education. The purpose of the assessment is to certify the achievement or progress in learning and is typically conducted at the end of a course or a programme (Earl, 2003).

While the Accreditation Council for Graduate Medical Education (ACGME), the Ministry of Health Singapore and other sponsoring institutions clearly describe In Training Examination as summative assessment that residents are required to pass in order to get to the next level of the programme (e.g. from residency year 1 (R1) to residency year 2 (R2)), it is categorised as formative assessment at the institution where this study is carried out. Although the In Training Examination results do not determine the resident's progression into the next stage in this programme, features of summative assessment are present in the way the results are used. For example, the In Training Examination results are used as one of the key performance indicators (KPI) and therefore strong emphasis is put on the In Training Examination results by the faculty as Georgie (senior doctor and faculty director) explains:

> *So it is supposed to be a formative exam, and yet it is one of our program KPI…we have an exam teaching, we have an exam workgroup within my core faculty...it is really a cramming course, so what we do is we get the last year's exam and all the areas that the residents did badly and we set question based on that, and then they do it online, so that we know their scores and which questions most people are now getting right and which questions they are still struggling in, and then we have a face to face session where we then discuss the areas that they are struggling in. (Georgie, senior doctor and faculty director).*

The notion of a 'formative exam' is noteworthy as examinations are usually summative. In Training Examination is formative in a sense that the residents have an opportunity to 'practice' for the examination, receive feedback and have opportunity for improvement. This

is an example of summative assessment design driving the nature of opportunities for 'formative' assessment. Given the examination is largely made up of multiple choice questions, we can assume it has limited potential for contributing to the more holistic competences and programme objectives outlined earlier in the report. However, clearly there is knowledge that residents must have at their fingertips in order to practice effectively. The question raised here is what type of assessment activity ensures validity of what is being assessed.

The In Training Examination results are graded and there is a passing score which residents are expected to achieve. The scores are then compared with the rest of the residents in the same cohort and those who belong to the low percentile are placed on the 'remediation' programmes to improve medical knowledge in their weak areas. Moreover, the residents who are at the bottom among the lowest even need to go through the 'extra' remediation programme as Tammy (programme administrator) explains below:

> *For specific residents who are doing very badly, we will plan extra remediation programme for them. For example, we will assign a tutor for them and that they need to attend all these revision lectures, which are not compulsory for other residents. Those who are doing particularly bad or those who want to revise they can come for the teaching sessions and they have to do more MCQ paper as well. (Tammy, programme administrator)*

Feedback is provided for improvement, with the emphasis on passing the examinations. Confidence is one of the key factors in learning (Eraut, 2007), however it would be interesting to explore if this labelling of low performing residents through the 'remediation' process may in fact undermine such confidence. These approaches are an implementation of the final programme objective of ensuring that residents pass their examinations.

In the following section we discuss tensions related to the features of In Training Examination and how they affect learners' attitude towards learning and assessment.

5. Tensions

Many aspects of the residency programme show its intent to offer authentic work-based assessment *for* learning, in addition to *of* learning. For example, Chart Stimulated Recall and mini-CEX (Clinical Evaluation Exercise) are designed to use real clinical cases and incorporate activities such as reflection and formative feedback. Also, elaborate descriptors in the RIME framework and competencies from the Accreditation Council for Graduate Medical Education International (ACGME-I) are used to assess the residents' performance in a holistic manner, rather than to assess their skills or knowledge in a technical manner. Moreover, assessors learn and practice how to interpret the descriptors through calibration workshops to ensure the consistency and reliability of the assessment. In order for these features to have substantial impact on the residents achieving the intended outcomes such as lifelong learning capability and holistic performance beyond technical knowledge and skills, the programme needs to overcome a number of tensions and challenges in three key areas: namely, future-orientedness, authenticity and formative assessment.

5.1 Future-orientedness

Here, we use the notion of "future-orientedness" with reference to "learners' readiness for work, and their ability to face future unknowns and new challenges beyond the immediate course/training" (Bound, Chia & Karmel 2016). This is closely associated with the purpose behind (the concept of) sustainable assessment (Boud, 2000), which encourages assessment practices to prepare learners not just for immediate needs specific to the course or programme, but for future lifelong learning needs.

Future-orientedness is captured in the conceptual framework developed by the institution as "ability to adapt and innovate to solve unexpected problems using deep learning and reflection". The framework is based on the overarching educational philosophy, which highlights the importance of healthcare professionals having capability to prepare for uncertainty and challenges in future. Nadia (programme manager), however, interprets it somewhat

Sustainable assessment

Sustainable assessment equips learners not just for meeting but preparing them for what might be required in the future, after graduation. Sustainable assessment includes '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). 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: (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)

differently. While acknowledging future-orientedness as the ultimate outcome to be achieved by the residents, she explains that:

> *future orientedness, you know, forward-thinking on how the future will look like, not just being able to practice in the here-and-now but being able to know what's the healthcare landscape we are going to operate in 5 years' time…you need to see what's going to happen in 10 years' time when you graduate. What's the healthcare landscape going to be, how is healthcare going to be developed. (Nadia, programme manager)*

Nadia's understanding of future-orientedness refers to '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; rather, Nadia's interpretation moves the emphasis away from reflective practices and resolution of unfamiliar problems (a key feature of future-orientedness) to predicting the landscape of future. Both perspectives have value and relate to the concept of sustainable assessment, which we will explain shortly.

A more critical point is that when asked how the required qualities are developed, Nadia said that the skills related to future-orientedness are taught in 'critical thinking workshops'. In fact, many other non-medical skills and attributes are also taught in classes: for example, communication course, ethics course and professionalism course. The data collected for the study do not show any evidence of these workshops being integrated into further practice or learning activities. More importantly, these qualities are not the focus of the summative assessments of the residency programme, which means the learners are less likely to pay attention to those qualities as noted by Biggs below:

> *They [learners] will learn what they think they will be assessed on, not what is in the curriculum, or even on what has been 'covered' in class. The **trick** is, then, to make sure the assessment tasks mirror the ILOs [intended learning outcomes]. To the teacher, assessment is at the end of the teaching-learning sequence of events, but to the student it is at the beginning. (Biggs, 2003, p. 3)*

As explained in the 'sustainable assessment' box above, Boud and Soler (2016) emphasise the importance of developing the capacity to prepare learners for future learning, through learning to make sound professional judgements through *"evaluate[ing] evidence, appraise situations and circumstances astutely, to draw sound conclusions and act in accordance with this analysis'* (ibid., p.19).

The residency programme offers opportunities for reflection and self-assessment. However, these opportunities are not always exercised. Self-assessment is included in some assessment forms, but in reality the reflection or self-assessment section is often left blank. Georgie (senior doctor and faculty director) thinks this is because residents are not used to assessing themselves. In addition, her past experience with self-assessment shows that "*the ones who do very well rate themselves very averagely…and the ones who don't, are not doing well at all, are the ones who rate themselves very highly*". This suggests that these individuals are making unrealistic judgements about their performance and require scaffolded support to improve their knowledge of themselves and their performance against the required standards. According to Georgie self-assessment is usually done verbally during the feedback session, and is not documented. She explains:

> *The only ones that we have documented, that we asked to assess themselves are the people who are doing very, very badly. Erm, we cannot, we are trying to figure out why they are doing so badly, so those people have reflective pieces, how they think*

they are doing and what they think can be done. (Georgie, senior doctor and faculty director)

Georgie shared her experience on self-assessment from low-performing residents, who mostly produced what she labelled as shallow or inappropriate reflection notes such as below:

"I felt that the programme did not give me enough feedback and then they should tell me more often".

Or some of them will just write, "I agree with what the programme director has said," that sort of pieces.

It often comes out like a case report, like, "The patient has this and this, and then I asked her this and this is what she said." Rather than how did I feel when I am with this patient.

Georgie believes that it is likely due to the fact that they have not been trained or taught in reflective practices or how to assess their own performance. However, in the palliative medicine posting most residents produce high quality, deep reflection notes. Due to the nature of this speciality, the reflection process is compulsory and all residents are required to submit written reflection. The remark below suggests that deeper reflection is enabled by the nature of the work, not solely by the individual resident's reflection skills.

It is a very popular posting for our residents, not because they want to do palliative medicine or because they think that palliative medicine will be useful for their future practice, but because they find it useful for themselves in the experience of it, as well as in teaching them communications and caring for the patient and their family as a whole. (Georgie, senior doctor and faculty director)

The palliative medicine posting provides the residents with the conditions for a deep awareness of communication capabilities and how patient-centric they are or are not. This story highlights the potential to build sustainable assessment into the programme. Notably, the ability to evaluate evidence, and situations and arrive at sound conclusions (Boud & Soler, 2016) seems remarkably similar to the way doctors are required to think as part of their everyday practices.

5.2 Authentic work-based assessment

Authentic assessment involves a focus on:

- performance (Darling-Hammond, 2014);
- students using and applying knowledge and skills in real-life settings (e.g. simulation of role play of a scenario, completion of a real-world tasks or assessment in a workplace setting) (teaching.unsw.edu.au; Mueller, 2016)

As such it involves higher-order cognitive activity and the collection of direct evidence of performance (Darling-Hammond, 2014; Mueller, 2016; teaching.unsw.edu.au).

The residency programme is an authentic work-based training programme where the participants work and learn at the same time. Assessment components such as Chart Stimulated Recall and mini-CEX (Clinical Evaluation Exercise) are closely integrated with the actual work. Knowledge is embedded in the assessment tasks that the residents perform,

which means they are assessed on not just what they 'know', but also what they can 'do' in real work settings or using real patient cases. These, however, are not favoured or prioritised by the residents, highlighting tensions inherent in the programme referred to earlier. Being a full-time doctor in a hospital, residents see their identity more as a worker than a learner; hence work tasks take higher priority than learning. This is clearly expressed in the following comments:

> *The main difference of course when they're in medical school you are studying and your priority is to end and pass your final exam, but when you become a resident, I think more importance is placed on patient care rather than training. I mean ideally it should be both at the same time but they are still a doctor first and then resident second. So responsibility of course will go to taking care of patient, make sure that patient are well and don't die. (Tammy, programme administrator)*

Unlike other formative assessment (e.g. the 360 Review or Monthly Performance Evaluation), Chart Stimulated Recall and mini-CEX require residents' active involvement throughout the assessment process of planning, executing and debriefing. This requires their time and effort, which is, according to Georgie (senior doctor and faculty director), why the residents do not view these assessments favourably. In fact, due to requests from many residents, the institution has already started to reduce the frequency of Chart Stimulated Recall and mini-CEX (Clinical Evaluation Exercise).

Second, such lack of buy-in from residents is because, despite being authentic work-based formative assessment, Chart Stimulated Recall and mini-CEX (Clinical Evaluation Exercise) are not well integrated with the summative assessment. That is, these assessments do not help the residents with the final certification examinations, most of which are written multiple choice questions tests. This apparent disconnection draws the attention of both the faculty and residents away from Chart Stimulated Recall and mini-CEX (Clinical Evaluation Exercise) and they are likely to participate in these authentic assessments as a formality. Moreover, the critical written examinations (that is, In Training Examination and Board Examination) are based on the US medical system and context, which are not applicable to or relevant in Singapore's context. Residents are forced to memorise such non-authentic and non-local knowledge to prepare for those written examinations and this means that good performance with those written examinations based on multiple choice questions cannot guarantee clinical skills in local settings.

While the results of written summative examination are expected to reflect the learner's progress made from the specialty posting experience, Georgie's experience as faculty director shows different outcomes. According to Georgie, those results are not impacted by authentic workplace learning through their specialty postings, but classroom learning through didactic lessons and cram sessions from 'Exam Workshops'. Georgie's experience is supported by Tammy (programme administrator) who said that "*we find that actually there is actually a skill to master MCQ [multiple choice questions] questions*". Tammy also thinks that the written examination results are not representative of the learner's capability or performance as she has seen residents with good performance doing badly at written examinations. In fact, research findings suggest harmful effects of written examinations based on multiple choice questions to learners such as simplifying the cognitive process and not preparing learners for complex or unknown situations (Kvale, 2007).

In summary, despite its nature as a training programme in authentic work environments and having formative assessments designed to use real work cases, the residency programme inadvertently gives greater emphasis to more summative assessment *of* learning.

5.3 Formative assessment: a burden?

The residents in the programme have three roles: a worker, a learner and an examination taker. As mentioned earlier, their work is the highest priority followed by passing the examinations. This makes holistic learning least important, which then creates a number of tensions related to assessment *for* learning. Because of the great emphasis on written summative examinations, competencies such as professionalism or lifelong learning capacity become lower priority and the residents allocate their time to work and preparation for written summative examinations.

As shown in Figure 2, this programme has very comprehensive and frequent formative assessments that are intended to enhance learning. Both the faculty and residents, however, struggle to carry out all these assessments while doing their job and preparing for the written examinations. Georgie (senior doctor and faculty director) said that "*getting assessment done is the biggest challenge*" for everyone and that chasing the faculty and residents to complete formative assessments takes the most time for the programme administrators such as Tammy. There were even cases where residents had completed a posting without doing any assessment at all. This suggests that the formative assessments have largely become a burden and formality to both the faculty and residents; residents do not see the usefulness of many of the formative assessments. In contrast, residents more actively participate in formative assessments such as Chart Stimulated Recall or mini-CEX (Clinical Evaluation Exercise) when they start to prepare for the clinical examination, which is Part 2A of Membership of the Royal Colleges of Physicians of the United Kingdom. This illustrates the impact of summative assessment on learner's attitude towards formative assessment. At the same time it strongly demonstrates the importance of making connections between formative and summative assessment.

Another important aspect of the formative assessment is the function of feedback to improve learning. While Georgie (senior doctor and faculty director) is sceptical about the effectiveness of the formative assessments in the programme as she believes that the learner's attitude more than anything determines the quality of learning, she acknowledges that the residents appreciate and value the qualitative comments that are included in their formative assessment forms. This is also consistent with the findings from the internal survey conducted by the institution, in which the residents selected qualitative comments as the most useful information to them. So on one hand residents value this feedback, on the other hand they are not always in a situation to organise the opportunities to gain such feedback.

In the same survey, the residents rated cohort comparison charts as the least useful information. Peer comparison is consistently used throughout the residency programme as a way to give feedback to the residents showing their performance level compared to their peers in the same cohort. Empirical evidence indicates that such comparison, in effect, works as a factor inhibiting learning instead of promoting learning. For example, strong focus on peer comparison is found to have demoralising impact on the low performing learner (Black & William, 1998). In addition, it also makes residents treat peers as their competitors and the low performers develop a negative feeling towards learning (Kvale, 2007).

6. Possibilities

In this section, we offer suggestions to overcome the tensions discussed above. One of the critical factors causing much of the tensions is 'time'. Too much load is placed on the resident doctors. It is natural for a doctor, as an occupation handling lives of other human beings, to place the highest priority on her work. On top of the job, she also needs to prepare for the licensing examinations to qualify for the next stage of her career. Formative assessments that are not associated with those examinations become secondary when she has limited time with more urgent and important things to do.

There are powerful possibilities for assessment *for* learning and also sustainable assessment in this programme. These possibilities will continue to be side-lined while the written summative examinations are such a critical factor in gaining accreditation. In order to meet the intended holistic aims and competencies of the programme, attention needs to be focussed on addressing this contradiction in the design of learning and assessment in the programme. This is difficult given that accreditation requirements are outside the control of the hospital. In addition the reality of delivering feedback on a monthly basis is clearly overly demanding for the assessors and the residents, as has already been noted by the designers of the programme. Developing assessment *for* learning and sustainable assessment that is doable yet contributes adequately to the development of the resident doctors is a challenging yet worthwhile journey to consider as it benefits all stakeholders. We suggest the following.

- Carry out comprehensive evaluation of the current assessment design and practices including getting feedback from the faculty and residents to identify issues, challenges and possibilities (for example, to better understand why palliative care produces strong reflective writing). The evaluation would include reviewing and aligning programme objectives, learning outcomes and actual learning and assessment practices.

- Make stronger connection between formative and summative assessment.

- Make stronger connection between strategies such as reflection and self-assessment and the work itself to contribute to making sustainable assessment more visible and real in the programme.

- More active use of feedback with formative assessment such as the 360 Review, Monthly Performance Evaluation and Clinical Competency Committee to assist residents to improve their learning.

7. Conclusion

This case study shows how the gap between intent, design and practices in assessment affects learners' approaches and attitudes to learning. Although learning and assessment activities occur in real work environments with elements of formative assessment, there are challenges like time resource constraint and impacts of summative assessment on career progression of the resident doctors. But there are strong takeaways in this case about: holistic assessment in the RIME framework; the design and intent of formative assessment that for example gives feedback from multiple sources, over time and in multiple ways, and strong authentic features reflected in assessment components such as Chart Stimulated Recall and mini-CEX (Clinical Evaluation Exercise). In conclusion, there are opportunities for assessment and learning in the programme by making stronger connections between formative and summative assessment, improving alignment between programme objectives, learning outcomes and assessment strategies, and thinking about how feedback practices e.g. feed-forward could be designed and used to enable learning.

References

ACGME-I (2016) ACGME-I *History*, Retrieved 21 June, 2016, from http://www.acgme-i.org/About-Us/History

Battistone, M.J., Milne, C., Sande, M.A., Pangaro, L.N., Hemmer, P.A., & Shomaker, T.S. (2002). *The feasibility and acceptability of implementing formal evaluation sessions and using descriptive vocabulary to assess student performance on a clinical clerkship*. Teaching and Learning in Medicine, 14(1), 5-10.

Biggs, J. (2003). *Aligning teaching for constructing learning*. Higher Education Academy, 1-4.

Black, P., & Wiliam, D. (1998). *Assessment and classroom learning*. Assessment in Education: principles, policy & practice, 5(1), 7-74.

Boud, D. (2000). *Sustainable assessment: rethinking assessment for the learning society*. Studies in Continuing Education, 22(2), 151-167.

Boud, D., & Soler, R. (2016). *Sustainable assessment revisited*. Assessment & Evaluation in Higher Education, 41(3), 400-413.

Cambridge Dictionaries Online (2016). *Meaning of "forward-thinking" in the English Dictionary*, Retrieved 25 June, 2016, from http://dictionary.cambridge.org/dictionary/english/forward-thinking

Colley, H., James, D., Tedder, M., Diment, K. (2003) "*Learning as becoming in vocational education and training: class, gender and the role of vocational habitus*" in Journal of Vocational Education and Training, 55(4), pp. 471-496.

Earl, L. M. (2003). *Assessment as learning: Using classroom assessment to maximize student learning*. Corwin Press.

Eraut, M. (2007). *Learning from other people in the workplace*. Oxford review of education, *33*(4), 403-422.

Khoo, S. M., Lahiri, M., Huggan, P. J., Archuleta, S., Olszyna, D. P., Goh, W. P., ... & Ho, K. Y. (2014). *When traditional model meets competencies in Singapore: beyond conflict resolution*. Ann Acad Med Singapore, 43, 544-9.

Kvale, S. (2007). *Contradictions of assessment for learning in institutions of higher learning*. Rethinking assessment in higher education: Learning for the longer term, 57-71.