
ASSESSMENT FOR THE CHANGING NATURE OF WORK:

FIRE-FIGHTING: ROTA COMMANDER COURSE

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Publisher's note

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CWL

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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**.

In this case study, we examine the training and assessment practices of a professional fire-fighting programme called Rota Commander course. The course which is designed and conducted by the Civil Defence Academy seeks to train Officer Cadets to become competent Rota Commanders of the Singapore Civil Defence Force. Officer Cadets develop basic competency in fire-fighting and “leadership”. The case-study reports on the development of these competencies that are developed in an integrated way and as an embodied process of learning by doing, practice and experience. It also highlights the demanding nature of fire-fighting; the rigour being put into the training, and the extensive use of simulators for learning and assessment. These findings raise discussions about the effective use of simulators for training and assessment, and they also change fundamental understanding about assessment defined by a distinction of purposes. Assessment in practice is dynamic, which is simultaneously assessment *of* and *for* 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).

Figure 1: Learning and assessment are entwined



Source:

http://www.123rf.com/photo_3706214_stock-photo.html

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

The emergency services including fire-fighting, rescue and pre-hospital medical care operations call for highly responsive, highly skilled and well-equipped professionals to do their job. The work of emergency first responders like fire-fighters requires them to be physically fit, to be able to read situations well, and to act decisively and promptly. Fire-fighters deployed at fire stations live with their colleagues and are in a constant state of readiness. Though armed with up-to-date equipment, tried and tested procedures, and sometimes operating in conjunction with other emergency service providers and/or forces, fire-fighters ultimately rely on their own courage, wit and resilience to walk into burning buildings, crawl under dark underground spaces, and scale heights in their helmet, bunker gear and breathing apparatus wielding cutters, hauling and laying hoses. Fire-fighting is arduous work that involves lifting, carrying, crawling and climbing, and fire-fighters have to respond promptly to the situations they face: How far away should the Staging Area be situated from the fire? How much can the body take before heat exhaustion strikes? Is that roiling blanket of smoke an indication of a flashover fire? Should manpower be deployed to evacuate the casualties first or set up a second jet to fight a spreading fire? Responses and decisions need to be made in a matter of split seconds, and they are often made at the bodily level. They have to be inculcated and drilled through training:

“When there is a big incident the Control Room will be activated, and the trainees will be brought to the fire ground in the middle or later part (of the fire) to observe what’s happening. So it’s not just the ‘theory’ or watching a video. They are there so that they can smell the problem; see the magnitude (of the problem); realize how tired the men are; understand how difficult it is to control the entire scene, and how the division commander controls the ground, and ground control the men...stuff like that” (MAJ Wasan, trainer).

Fire-fighters develop a system of dispositions towards and ways of thinking (Desmond, 2006) about danger such as running into a fire instead of away from it. Organisations like the Civil Defence Academy (CDA¹) build, develop and condition these dispositions by putting trainees through ‘realistic training scenarios’ using simulators like Liquid Petroleum Gas bullet tank fire simulator, oil tank fire simulator and high-rise building fire simulator affectionately called the ‘Furnace’.

The dispositions and ways of thinking for an Officer Cadet in becoming a Rota² Commander include leadership. Leadership is a fundamental aspect of a Rota Commander and it is inculcated throughout the Rota Commander programme but also developed and taught more specifically as a job role and function in subjects such as ‘Command and Control’, which is further honed and assessed in ‘Scenario Packages’ and ‘Command and Control Assessment’ simulation exercises. To be a competent Rota Commander also includes having the ability to read the ground well; to know what is happening at all times and be in control of the scene; to be able to make the right decisions promptly, and to persevere under duress and/or in extreme physical conditions. All these are perhaps better expressed in action and better understood in the future as the Officer Cadets grow into their role as Rota Commanders of the Singapore Civil Defence Force (SCDF). This case-study highlights the development of core competencies through an embodied process of learning by doing, practice and experience; foregrounds the nature of a demanding profession, and

¹ As a training institution of the Singapore Civil Defence Force (SCDF), the CDA conducts all professional and specialized trainings in the field of civil defence including disaster management, fire-fighting, urban search and rescue, detection and mitigation of hazardous materials and pre-hospital medical care operations.

² Rota – “a round or rotation of duties; a period of work or duty taken in rotation with others” (<http://www.dictionary.com/browse/rota>)

discusses the role and use of simulation. It raises discussion about forms of knowledge and skills such as “leadership” and effective use of simulators, which seek to advance an understanding of learning and assessment, and highlight possibilities for other vocations.

In the 28-week programme, the Officer Cadets are taught fundamental skills, knowledge and strategies of fire-fighting; they familiarise themselves with the use of equipment and gain some exposure to the work of a Rota Commander during field exercises, and are enculturated into the officer corps of the SCDF. More importantly, they begin to adapt themselves to that role, and prepare themselves for the practical logic of work as a fire-fighter and purpose of fire-fighting. It is understood that the programme prepares them for learning to become a Rota Commander upon graduation and placement. That is, the course provides preparation for undertaking this role but it is understood that it is only through experience that the Officer Cadets truly learn to become a Rota Commander.

This report is based on observations of two field training exercises and one final summative assessment exercise; interviews with Officer Cadets (learners), trainers and assessors, and analysis of training curriculum and assessment documents centring around a module called ‘High-rise Fire’. We also focus on the final summative assessment activity that includes a series of exercises where we observed one final exercise. In these exercises, the Officer Cadets are assessed by an ‘external’ Senior Officer who holds a Commander Fire Station (CFS) appointment. Some of the key highlights for the design and development of assessment in this report include the following:

- 1) Enabling sustainable assessment defined broadly as learning beyond the immediate course/programme where trainees are able to *‘make judgments about their own work and course-wide assessment’* (Boud & Soler 2016, p.400);
- 2) Balancing professional judgement and consistency in processes of assessment, and
- 3) Thinking about and writing assessment (criteria) more holistically in order to encourage/improve performance.

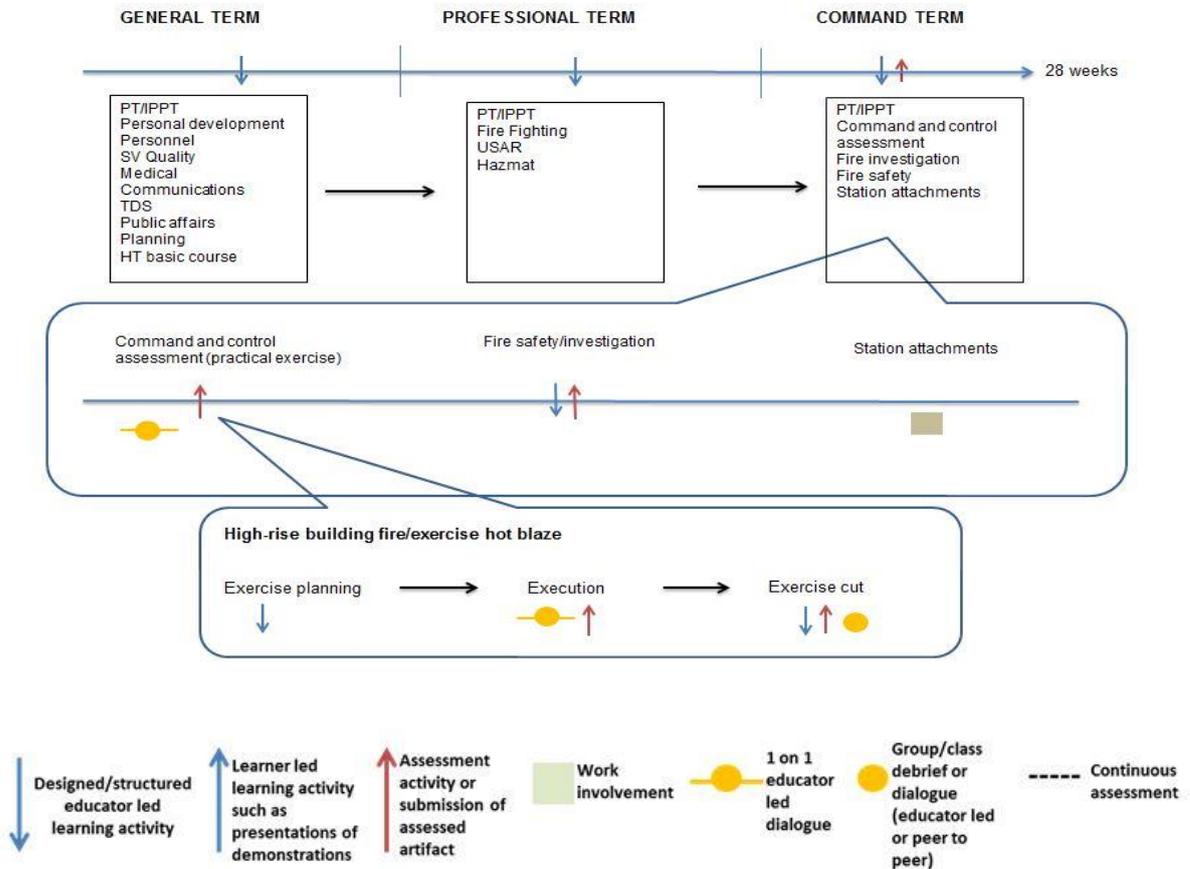
2. The Rota Commander Course

In this report, we enter into the grounds of the Civil Defence Academy to look at how Officer Cadets are trained to undertake the role of a Rota Commander in fire stations, or other frontline commander positions. Officer Cadets are enrolled in a 28-week Command and Leadership programme where they will earn their pips as Lieutenant or Captain as well as an 'Advanced Diploma in Emergency Response and Incident Management' and a WSQ-aligned certificate in 'Responding to Fire and HazMat Emergency' upon successful completion of the programme. The broad training goals of the programme are articulated as follows:

Participants will be trained to assume the role of a ground commander in fire-fighting and rescue operations, and understand the tactical considerations involved in such incidents. Additionally, the course covers training on civil defence related systems, and participants will understand and apply the capabilities of the Singapore Civil Defence Force. At the end of the course, the Officer Cadets would acquire the requisite skills and knowledge to perform the role of a frontline commander effectively. (Rota Commander Course – Training Directory 2015/2016, p.28).

While the programme may be considered to be 'pre-employment' training designed to condition and inculcate primarily novices to take on the role of Rota Commander, it also addresses the need for authentic work-based practices, experiences and challenges. The 28-week programme is divided into three phases: General, Professional and Command terms. The General term aims to enculturate Officer Cadets into the Singapore Civil Defence Force through a series of conditioning and orientation modules. During the Professional term, Officer Cadets are trained at the individual and command level on fire-fighting skills, knowledge and strategies; equipment handling and usage; rescue and Hazmat (Hazardous Materials) operations. During the Command term, training focuses mainly on 'scenario packages' or field exercises that put Officer Cadets into roles as Rota Commander or Platoon Commander. These exercises bring together everything that has been learned in the General and Professional terms, and the Officer Cadets are assessed on the explicit learning outcomes of the Rota Commander programme: command and control capability, fire-fighting skills, strategies and knowledge, and operation of systems and procedures. Physical fitness is fundamental - PT (Physical Training) sessions and IPPTs (Individual Physical Proficiency Test) are conducted throughout the 28-week programme (see Fig. 1 below).

FIGURE 1: THE ROTA COMMANDER COURSE



The curriculum design of the 28-week Rota Commander programme and its assessment approach can be summed up as *accumulative* i.e. Officer Cadets gather skills and knowledge over the 20-odd weeks that *culminate* in a penultimate assessment comprising of a series of simulation exercises.

3. Intent of Course and Assessment Design

As with most official course and/or programme documentation, the wider and deeper aspects of what are actually taught and learned such as leadership, perseverance and situational awareness that are deeply embodied are not and could perhaps never be exactly captured. Leadership, situational awareness, quick-thinking and physical fitness are some of the most important aspects or 'essence' of a Rota Commander. Fundamental aspects of the Rota Commander such as leadership have been conceptualized in 'subjects' like 'Command and Control' primarily as performance of role and job function, and in other subjects like 'Personal Development' as a list of qualities, skills and knowledge. The course documentation describes some of these aspects in 'course objectives' as follows:

- Command and Control:
- Provide necessary knowledge and practical exercises on operation management and leadership to prepare cadets to assume the role as Rota Commander or Platoon Commander.
- Personal Development:
- Equip cadets with knowledge and skills for their personal development e.g. leadership:
- To raise self-awareness about individual strengths and weakness
- To develop perseverance to face challenges and adversity
- To inculcate the importance of initiative
- To develop decision making and planning skills
- To engender a spirit of compassion for others
- Emulate the characteristics of self-leadership
- Able to define leadership
- Able to describe various approaches in leadership styles
- Able to describe at least 5 character traits of good leaders
(Rota Commander Course, Block Syllabus, p.1)

Officer Cadets are also inculcated and indoctrinated as leaders formally through events like the Commissioning Parade and Oath Taking Ceremony. What we have observed during the field exercises and based on interviews with instructors and assessors is how aspects like leadership are not so easily distinguishable, and how the real essence or principles of leadership is expressed in action, and learned through demonstration.

Instructors and assessors are concerned about making sure that the Officer Cadets do the right thing, understand what they are doing, and know what is expected of them because the situation on the ground may not be straightforward:

We are driven by the final outcome which is to save lives. So there are times where I have to decide whether to carry the casualty out first or fight the fire. Because when I bring the casualty out, the fire is going to continue burning and grow bigger. So how do I balance these two decisions, and how far should I evacuate the casualty? So you need to be able to balance, and like I said it depends on the situation. The situation may be different but have you really seen that situation as it is – to understand the situation before you talk about deploying the men? So, these are skills that the Officer Cadets must have which they must demonstrate in every situation. The 'Appreciation of Situation' is fundamental to being a Rota Commander or a leader in the organization. It's a matter of fact so to speak – you have to. So, as a Rota Commander you must be able to justify your actions and we want the Officer Cadets to be able to do that. (MAJ Tom, Assessor).

The nature of the work of fire-fighting and complex role of a Rota Commander raise considerations about how assessment strategies and practices could be designed and developed to capture/enable some of these fundamental aspects.

3.1 'Train as We Operate': Training and Assessment Doctrine

The courses including Rota Commander Course offered at the Civil Defence Academy are designed to reflect real operations, and they are guided by the doctrine of "train as we operate" (SQASC 2015, p.61). "Train as we operate" entails authentic training and assessment that are current and reflective of ongoing operational needs. It includes the use of realistic simulation that depicts close to real-life fire scenarios trainees will face on the ground as fire-fighters. Trainees including Officer Cadets are immersed in a holistic, realistic and dynamic training and assessment environment that aims to prepare them to respond effectively to real-life incidents. Trainees are also assessed by "subject matter experts" who are experienced fire-fighters and/or Rota Commanders. Assessors are carefully selected and matched to the type of assessment scenario, and Civil Defence Academy instructors help to mediate and bridge what the assessors bring to the assessment in order to ensure learning for the trainees. Assessment also involves the support and coordination efforts of the Academy to provide the huge logistics including an operational pumper (fire-engine truck with full equipment) and administrative support from technical, facility, logistics and other training branches/departments. To "train as we operate" is to push Officer Cadets to their limits but it does not compromise on safety. Safety is ensured through applying measures such as immediate shut-down switches at fire simulators; the deployment of devices and sensors like thermal image camera, heat sensor, air temperature sensor and LPG leak detectors etc.; the use of weather monitoring system to provide daily temperature reading that feeds into assessment and training schedules, and the development of a Training Safety Regulation Manual that details training safety procedures. The Academy also keeps its training and assessment procedures updated by gathering feedback from fire station commanders on the performance of its trainees, and also by sending officers to fire stations as observers and to obtain feedback. There is a strong established and continuous relationship between the provider (CDA) and their graduates' world of work, importance for authentic learning and assessment (discussed later).

3.2 The Module: High-Rise Fire

In the module "High-rise Fire", Officer Cadets learn about fire-fighting strategies and tactics³ in "High-Rise Building" (HRB), and "Super High-Rise Residential Building" (SHRB). "High-Rise Fire" is one of the most important modules in the Rota Commander programme as Singapore is a highly urbanised and built-up city with a high population density. Due to the height of these buildings which are beyond the reach of aerial and external fire-fighting approaches, the doctrine for fire-fighting in HRB and SHRB is typically limited to a strategy of 'internal fire-fighting' where fire-fighters must advance floor-by-floor through the heat and

³ At this stage in the programme, the Officer Cadets would have completed their Basic Task Manual (BTM) training which covers basic fire-fighting skills and use of equipment that are learned through drills. The result of these repetitive and taxing drills is efficiency – it focuses on techniques like lifting, laying, connecting, and also dexterity to acquire or achieve a certain level of efficiency (Mauss, 1968).

smoke to extinguish the fire. The Officer Cadets engage in classroom learning, go through drills, and practice in simulation exercises at the “Furnace”. In fire-fighting strategies and tactics, there are other more implicit qualities of performance that involve optimal utilisation of resources and manpower deployment, an alertness or situational awareness of the environment and knowledge of building/infrastructure systems. Officer Cadets need to be able to identify and prioritise tasks, and judge what the optimal level of resource and manpower utilisation is needed. The penultimate or final summative assessment for this important module is conducted over a series of simulation exercises near/at the end of the Rota Commander programme.

3.3 Assessment Exercises: A Case for Holistic Assessment

During assessment exercises, Officer Cadets are assigned command roles as Duty Officer/Ground Commander, Staging Control Point I, and so on. These Appointment Holders are expected to demonstrate the dispositions and ways of thinking as Rota Commander, and their performances are graded or marked based on a weighted list of skills, ability and process. An assessment checklist is used and it includes components such as “Appreciation of Situation”, “Supervisory skill”, “Command ability”, “Operational result/outcome” and so on.

For each component on the checklist, there are specific tasks the Appointment Holder needs to perform and dispositions to be demonstrated. For example under “Appreciation of Situation” (AOS), the Appointment Holder will be assessed based on a series of tasks that reflect his/her demonstration of situational awareness and sense of urgency; ability to identify risks, and gather relevant information about the situation⁴. The checklist focuses on what are the common tangible practices to achieve “Appreciation of Situation”. It establishes a baseline for “basic competency” in terms of the ability to carry-out key tasks/activities. Course designers, co-ordinators and instructors highlight the rigour that go into the design of the checklist where field experiences are converted into observable assessment tasks which provide “common points” for assessment with an emphasis on fairness and objectivity. The decision to use a checklist in assessment is a pragmatic one – to train and transform ordinary citizens into effective Civil Defence Officers and/or fire-fighters within a given span of time.

Course designers, co-ordinators and instructors are cognisant of how professional competencies like responsiveness, alertness, awareness and decisiveness (or what instructors such as LTA Uma call “street smart” or savviness) that involve combinations of tasks or activities, modes of understanding, interpreting and communicating, could be developed only with time and experience as these Officer Cadets grow into their role as Rota Commanders upon graduation from the course. Experienced Rota Commanders like MAJ Tom (assessor) talks about what he calls “guiding principles” (beyond the notion of “task”)

⁴ ‘Appreciation of Situation’ could also be conceived as a sense-making collaborative process (Dryks, Deneff & Ramirez 2015) rather than tasks and/or individual task-based outcomes. As primarily a reconnaissance activity, ‘Appreciation of Situation’ fundamentally involves an understanding of the issues, conditions and risks; the main goal is to gather information to answer questions like ‘what is going on here?’ and ‘what needs to be done next?’ Sense-making is about depicting impressions (of a situation), giving interpretation of that situation, recommending a course of action, and communicating information/findings through the chain of command. All these are not necessarily explicit or evident in the assessment tasks but are critical competencies to do a good ‘Appreciation of Situation’.

which are conveyed in teaching/learning moments (see later section “Formative-Summative Assessment”). He says:

“The same guiding principle will guide you to do another job not because I tell you to but because you have the principle and guideline. We are not trying to be prescriptive because it is not possible to cover all scenarios or situations, so we go into guidelines to guide what they should do as a Rota Commander. We can tell them but they still cannot prepare – like for example one of the requirements is the ability to think on their feet” (MAJ Tom, assessor).

Both LTA Uma’s and MAJ Tom’s reflections suggest that there are opportunities for assessment to enable competencies such as “savviness, quick-thinking” beyond a fundamentally task-based one. We make two observations here: firstly, how professional *competencies* such as leadership, situational awareness, decisiveness and so on are intertwined with *tasks* that involve fire-fighting skills, strategies and knowledge, and familiarity with SCDF operating systems and procedures. Secondly, the lines between summative and formative assessment in reality (or in practice) are blurred where instances of formative assessment are blended into summative assessment that we will discuss in the next section.

4. Assessment of/for/as Learning

The 'Final Exercise' is a series of simulation exercises some of which are conducted at the 'Furnace'. The 'Final Exercise' carried out at the end of the Command term where Officer Cadets have to demonstrate (and put into action) what they have learned and trained for over the past 20-odd weeks. The objective of 'Final Exercise' is stated as follows:

'Demonstrate the ability to deploy, handle, and perform fire-fighting and rescue in high-rise building in accordance to the high-rise operation procedure' (Rota Commander Course, Block Syllabus).

The focus and responsibility rests heavily on the Officer Cadet who role-plays as the Duty Officer or Officer in-charge during the exercise and is assessed according to the assessment checklist described above. The other key leadership roles include Staging In-Charge; Breathing Apparatus Checking Officer (BACO) and Section Commanders. In this exercise that we observed, the Officer Cadets have to respond to a simulated apartment fire on the 8th floor of a multi-storey building. They are required to carry out the correct methods and procedures of fire-fighting including situation assessment, identification of deployment areas and structures such as landing valves and risers as well as demonstrate the proper handling and use of equipment like the laying of hoses, setting-up of staging area/staging board.

The pressure is felt most intensely by Officer Cadets who have leadership appointments like the Duty Officer (DO)/Ground Commander, Deputy Commander and Staging Point IC. The centre of assessment falls on the Duty Officer who has to interpret the situation, deploy his forces, organise and supervise the fire-fighting, and ensure completion of the mission. The Duty Officer directs the fire-fighting strategy i.e. where to enter the building, what/ where to deploy, and who/ when to move. The exercise is fast-paced and executed with a great sense of urgency. The Officer Cadets understand the procedures and time criticality of the exercise:

'First you have to charge the hoses to the dry riser to bring water up to the unit. Then at the same time, the crew below will have to bring hoses and nozzles up to the fire floor or below the fire floor then they set out all these things. So when the first jet is set up, that is the time which is very critical which they normally tell us we have to do in five minutes - that is the challenging part of this exercise' (Officer Cadet Brenden, learner).

During operations, the Officer Cadets are suited up in their Breathing Apparatus (BA) and bunker gear; they have to move bulky equipment like hoses and valves into the fire-simulator building sometimes on foot in the event the lift is not working, and they have to confront physical challenges like fatigue, cramps and heat exhaustion. At the same time, they also have to respond to "injects" from the assessor like "equipment failure" and "casualty" that add to the already stressful and chaotic situation unfolding.

4.1 Formative-Summative Assessment: Some Implications

Even though the exercise is primarily a summative assessment, there are formative assessment elements throughout with “technical breaks” and de-brief sessions called out by the assessor during the exercise. Technical breaks can be called out by the assessor when s/he finds safety breaches, poor coordination and execution of the exercise, and/or failure to meet the exercise objectives. During these technical breaks, the Officer Cadets are guided by the assessor to identify what went wrong, and they are given the opportunity to recall what the right procedures ought to be, what each role in the Rota entails, and what the exercise objectives are. Appointment holders especially the Officer Cadet Duty Officers are “asked” to state the problems, explain the situation and justify their actions and/or decisions. They are also “asked” to reflect upon themselves and to propose corrective actions.

However, in most situations because of the confusion as a result of the scale and spread of the exercise⁵, the Officer Cadet Duty Officer often does not know that s/he has made a mistake and/or is unaware of problems occurring elsewhere in and/or outside the building which are not within his/her earshot or line of sight. The general lack of experience in dealing with highly complex combinations of problems, issues and multiple demands that require rapid decision making shows itself. The use of ‘questioning’ by the assessor in this particular exercise is meant to help the Officer Cadets become aware of their mistakes. This is a note from our observation of the exercise:

After the first technical break, the Officer Cadets repeated the exercise all over again. The stress and fatigue were beginning to show in their faces and movements. 20 minutes into the exercise, a second technical break was called: MAJ Tom (assessor) berated the Officer Cadet Duty Officer on the lay-out of the equipment as well as the Section Commander for putting the bridging apparatus ‘too far down’ on the wrong floor. MAJ Tom asked the Officer Cadet Duty Officer if he knows what went wrong. The Duty Officer replied that there was time pressure to get the first jet going. MAJ Tom added that time would always be of essence in any real life situation; he highlighted that there had been a safety breach when a few of the Officer Cadets proceeded further without putting on their BA equipment. He raised his voice and scolded the appointment holders for what seemed like a dereliction of duty: “Get the basics right...your job as Section Commander...as Duty Officer...” A crew swap was initiated by MAJ Tom and it threw the Officer Cadets off their feet because it messed up their initial manpower planning and allocation of duties. Taking a short break, the Officer Cadets discussed amongst themselves about the problems they encountered earlier such as the water-riser issue that resulted in ‘no charge’ as well as the sub-optimal manpower planning and allocation of duties. (Observation notes, 21-Dec-2015).

Course co-ordinators and instructors have explained how the assessor’s actions including the constant questioning and shouting at Officer Cadets, and crew swaps during the assessment were meant to re-create the stressful situation, urgency and potential disruptions to laid-out plans that fire-fighters on the ground would face sometimes with a

⁵ The situation can become increasingly chaotic and stressful for the Officer Cadets as it unfolds. The chaos is not unexpected as the high-rise fire is one of the most challenging missions given that it is difficult to exercise effective command and control as the men and equipment may be dispersed both inside the building and outside.

barrage of demands and desperate pleas from the public, and a dynamic fire situation. The Officer Cadets have to cope with these pressures and carry out their mission.

Based on our observations, the Officer Cadets seemed to have understood their problems quite differently from how MAJ Tom had put it to them- they talked about their problems as primarily technical in nature, that is, things broke down or did not work, there was no communication (either due to the lack of communication equipment/network or miscommunication) between the crew whereas MAJ Tom highlighted the problems to be essentially a competency issue - the Officer Cadet Duty Officer and other key appointment holders like the Section Commanders did not seem to meet the assessor's expectations with respect to their (command) roles. The problems are certainly difficult to disentangle and rationalise because of the complex nature of the high-rise fire exercise, the relative inexperience of the Officer Cadets as Duty Officer and other key appointment holders, and pressures of the "Final Exercise".

4.2 Processes of Assessment: Consistency of Judgement

Due to the varied nature of the final exercises and different "specialisation" of the assessors which depend on the location of their fire-stations (residential, commercial, marine, industry, Hazmat), there may be differences in emphasis and experience of the assessment. MAJ Tom is a commander of a fire-station based in a residential estate. During the high-rise fire exercise we observed, there was a strong emphasis on command and control (and leadership); he was pro-active in directing and *demonstrating* to the Officer Cadets what they should be doing:

After the second technical break, the exercise restarted again. This time round, the Officer Cadets showed a heightened sense of urgency- the Officer Cadet Duty Officer was shouting commands and instructions, and the pace also seemed to have quickened. MAJ Tom played an 'inject' - fire spread to the next unit. The Officer Cadet Duty Officer was screaming for the Officer Cadet Section Commander to take over the first jet, and he was seen literally being dragged by MAJ Tom into the second unit fire to lead the crew in setting-up an attack jet. Shortly after, the Officer Cadet Duty Officer appeared to be listless and another Officer Cadet was seen stepping up to help the Officer Cadet Duty Officer. MAJ Tom began to direct the Officer Cadet Duty Officer: "Now you need manpower here, GO AND GRAB MANPOWER!" There were more shouting: LTA Uma (instructor) reminded the Staging In-Charge and Breathing Apparatus in-Charge Officer (BACO) to do their job in updating the Staging Board and ensuring that the crew are properly geared up before proceeding into the fire. (Observation notes, 21-Dec-2015).

The interventions by the assessor are meant to be learning points but all these and the purposes of assessment may not have been apparent to the Officer Cadets. By the time a third technical break was called during the exercise, the Officer Cadets were all visibly worn-out. MAJ Tom highlighted what went right and what else went wrong: the first and second jets were set up in time but there was no teamwork. He emphasised that the Duty Officer needed to exercise *leadership* by directly attending to the fire situation; the Duty Officer needed to "ensure" and not just give commands or instructions. MAJ Tom said, ' *You (the Duty Officer) need to bring up the Deputy Duty Officer; you must go to the Staging Area and bring one section up yourself*'. Through his actions and guidance, MAJ Tom *demonstrated* to the Officer Cadets the principles of leadership. He also highlighted specific problems like

the location and number of casualties in the building that the Officer Cadets had failed to notice and deal with.

Not all the assessors are like MAJ Tom. The Officer Cadets talked about the “intimidating” but varied experiences they had with different assessors:

The assessor I got (for a different exercise) was from a Hazardous Material (Hazmat) fire station. I didn't know what to expect from her but during the (summative) exercise she conducted it in a sort of way as an instructor (rather than assessor). I think she wanted me to get the basics of the Hazardous Material procedures right while some other assessors from other fire stations might use it as a chance to assess for example 'command and control'. So no matter what you do rightly or wrongly, they would not try to pin you halfway. Some assessors will tell you what's wrong at the end of the exercise. But for her during the exercise, she dropped some hints. So, it actually varies from assessor to assessor but ultimately all of us will learn something from them no matter who they are (Officer Cadet Kris, learner).

My assessor likes to play injects so right from the start he already did some injects like for example 'pumper down' (fire-engine truck break down) - it is not moving. So, he wanted to see how I react to that situation, and even before that he injected a 'fire deCam' which is basically like a fire alarm going off in the building. So I had to go and investigate. That was his style; he wanted to see how I react to different situations because he said quite often things may actually happen like that when you're at the station: halfway you're responding to a situation, something else crops up then what do you do. So that was his style of assessing me (Officer Cadet Brenden, learner).

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 judgment but presents a challenge to those designing assessment where consistency (of standards and judgment) and objectivity are sought especially in/for a summative assessment situation. The tension is expressed and (mis)understood by the Officer Cadets as “subjective” assessment shaped by the style, personality and varied expectations of the assessor. It may not be clear to the Officer Cadets that the assessment is context driven (by type of exercise) and dependent on the professional experiences and judgment of the assessors⁶.

Apart from trying to complete their mission, coping with fatigue and (situational) injects or changes, the Officer Cadets were also struggling to understand and interpret what the assessor was telling them, and figuring-out how to respond to the pressure, critique and instructions from the assessor. The assessor in the exercise that we observed played a dual role as instructor and blended formative with summative assessment. He demonstrated to the Officer Cadets what “leading by example” entails, and guided them to identify critical

⁶ What the Officer Cadets have learned most successfully and consistently though is the adaptation of the body to technical uses or techniques (Mauss 1968, p.86) where they develop alertness, sense-making ability, responsiveness and perseverance in the face of dynamic situations, pressures and physical challenges. These techniques are highly proceduralized and used for a very specific purpose which is to save lives. And the most basic education in techniques is to adapt their bodies to this purpose and authority (ibid). The Officer Cadets learn or realize some of the most fundamental lessons through their bodies in overcoming some of these challenges. This is succinctly expressed in one of the Officer Cadets' statement about the most important lesson they have learned: *What Madam Uma has taught us is that (physical) pain will never go away, no matter what. We just have to work with it.* (Officer Cadet Kris, learner).

points, trace problems and fix them. Given the complexity of a high-rise fire-fighting operation/mission, there are multiple challenges for course and assessment designers in terms of clarifying the purposes of assessment to the Officer Cadets, and achieving consistency in assessment whilst enabling the professional judgment of assessors. This case highlights how assessors play a key role in facilitating understanding, reflection and performance. The assessor acts as a mentor who guides, calls for time-outs and facilitates learning and he also plays an important role to “close the gap” between a controlled training/learning environment (driven by the dual needs for realism and safety), and the “real world” of fire-fighting where situations evolve and are more complex. All these issues and concerns could be better addressed through:

- Shared understanding by all assessors of the purpose of the assessment and the process of the assessment;
- Improved transparency of the assessment, so Officer Cadets understand what and how they will be assessed, and against what criteria.

5. Possibilities

There is room for thinking and designing assessment *for* and *as* learning in terms of writing assessment criteria, and integrating assessment into the curriculum and pedagogy. On a more specific note, there is potential for assessment and course curricula to focus on assessment *for* learning that highlights and/or enables *practical understanding*, and *exercise of judgment* in order

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)

to meet changing and/or dynamic needs. Final exercises give Officer Cadets a chance to work directly with an "active" Rota Commander/Fire Station Commander in his/her role, and it is a valuable learning experience for them. But that experience could have been enriched by thinking about how to better engage with the Officer Cadets before and/or during the assessment. This would require Officer Cadets to be given the chance to sort out, identify, and work out how to address errors and challenges rather than only working from mistakes pointed out to them. That is, Officer Cadets are given the opportunity to come to a better realisation and recovery from mistakes *on their own accord*. Reflexive communication skills are essential to this process whereby questioning and working with alternatives as well as variations are emphasized.

Such an approach creates potential for the use of *sustainable assessment* that encourages learners "to be aware of their own learning needs" (Boud & Soler 2016, p.404). There are opportunities for sustainable assessment to help Officer Cadets make (better) judgments of their own performance and work. For example the debrief that is given by the assessors or trainers could follow the Officer Cadets own debrief in order to point out to the Officer Cadets what they had missed in their awareness if they did not identify it first by themselves, and then a confirmation or acknowledgement could be sought from the Officer Cadets to ascertain if they have recognised the issues or problems. These Officer Cadet-led debrief sessions could become part of the assessment (criteria) where they learn how to account for their own progress and performance. Assessors could then work with the Officer Cadets to identify gaps in understanding, to achieve a better appreciation of the (assessment) criteria, and develop professional judgment.

Given their limited or no experience as Rota Commanders, their understanding could be (better) supported by assessors to help them identify mistakes or problems during/ throughout the exercise. This could be done through “injects” where assessors could either escalate and/or reveal problems and mistakes made by the Officer Cadets, and leave it to them to solve or deal with the consequences, but operate safely. Regardless of the outcome of the summative assessment, the Officer Cadets’ evaluation of the exercise could then be compared with those of their assessors to highlight learning gaps and possibly remedial action such as “re-do” of the assessment exercise, and/or re-training if necessary. The main point is to enable the Officer Cadets to identify *on their own accord* what they need to learn, and how they could drive their learning beyond the timescale of the Rota Commander programme.

Conclusion

This case-study highlights the learning and assessment practices and spaces through which Officer Cadets train and develop as Rota Commanders of the Singapore Civil Defence Force. The nature of fire-fighting work is demanding, dynamic and situational. The training is continuous and gradual, and it aims to be as authentic as the operational requirements of real emergency and/or fire situations and yet safe. Because this is a leadership programme, competencies like decision-making, the ability to delegate and communicate effectively are central amongst other skills, and all these are learned and assessed in classrooms, practice drills and simulation exercises. These competencies involve combinations of tasks or activities, modes of understanding, interpreting and communicating that could be supported and enhanced with formative assessment. Instructors and assessors strongly demonstrate and enact formative assessment where they facilitate learning and also play an important role to “close the gap” between a controlled training environment and the “real world” of fire-fighting where situations evolve and are more complex. For example, the use of simulations and their assessment in a highly controlled environment are valuable in enabling authentic workplace learning and practice. The effectiveness ultimately depends on the:

- clarity of learning outcomes,
- alignment between learning outcomes and assessment activities and criteria,
- manner in which the learning and assessment is conducted to enable performance as well as opportunities for reflection and understanding.

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