

 ADULT
LEARNING
SYMPOSIUM

Using Interactive Video for Skills-based Training – A Case Study

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1 November 2018

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Background

- The Department of Educational Development (EDU) was approached by Singapore Polytechnic's Energy & Chemicals Training Centre (ECTC) to assist an Energy and Chemical company to find a solution to help upskill their process technicians.
- This company operates a highly automated terminal on Jurong Island.





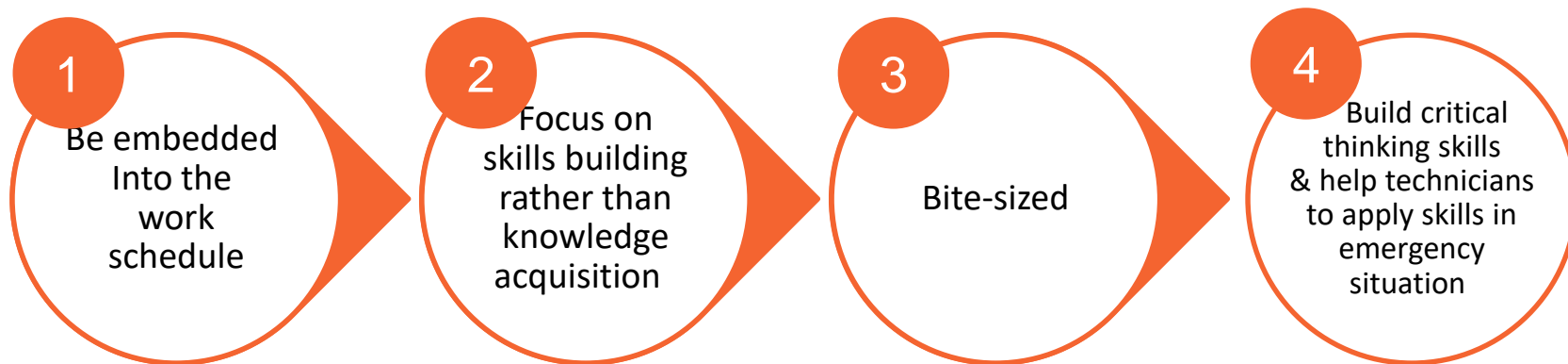
Background

- The industrial terminal serves a large and growing number of manufacturers and suppliers located on Jurong Island.
- To match the pace of change with the technology, technicians must continue to have **current and relevant skills** not only to perform efficiently at their work, but to ensure that **all safety aspects are also strictly adhered to.**



Background

In order to upskill the technicians, certain conditions were requested when designing the learning experience:





Singapore Polytechnic's Simulated Practice Framework

- “...a simulation is a technique that helps to replace and amplify real experiences with guided ones, often “immersive” in nature, that **mimic substantial aspects of the real world** in a fully interactive manner.” (Lateef, 2010)
- Simulation-based training can be a good way to develop learners’ competencies (knowledge, skills, and attitudes), whilst protecting them from unnecessary risks.
- The realistic scenarios allow for **deliberate** and **repetitive practice** till one can master the skill.



Simulated Practice

The Simulation Process

	PRE	DURING			POST
SEQUENCE	PRE-BRIEFING	ACTUAL SIMULATION			DEBRIEF
STIMULUS	<ul style="list-style-type: none"> Activity Worksheet, or Situational Challenge, or Project Brief State the Habits of Minds to be developed during simulation 	Level 1 (Beginner) • No or low-level situational "whatifs" expected of lecturers or students	Level 2 (Intermediate) • Mid-level situational "whatifs" expected of lecturers or students	Level 3 (Advanced) • High-level situational "whatifs" expected of lecturers or students	Basic → Advanced More direct Less inquiry → More self-directed More inquiry
LECTURER'S ROLE	<ul style="list-style-type: none"> Present Stimulus Contact-Giving, Frontloading Assure Safety and Access of Learners' Facilitation during Actual Simulation period Brief on Assessment Criteria 	MORE LECTURER-DIRECTED <ul style="list-style-type: none"> Share Knowledge Demonstrate Give Instructions 	LECTURER-CONTROLLED • Encourage • Participate	• Resource • Mentor	• Lecturer-directed: one-way • Lecturer-facilitated: inquiry-based - Good Cop, Bad Cop - Student Sup-Roles/acts - Deba - The "Whatifs" - Pinpointing
STUDENT'S ROLE	A B C D <ul style="list-style-type: none"> Ascertain Broaden Challenge Decide 	MORE STUDENT-INQUIRY <ul style="list-style-type: none"> Discover Follow Procedure Low Decision Making 	IMMEDIATE, IN-SIMULATION FEEDBACK STUDENT-CONTROLLED <ul style="list-style-type: none"> Enactment Dynamic 	<ul style="list-style-type: none"> Immersive Highly fluid Outcomes determined by actions 	<ul style="list-style-type: none"> Self-directed Peer-led: two-way
ENVIRONMENT	The Briefing Room to accommodate all students who will be taking part in the actual simulation. A- Rigour of Activity E- Industry-Neutral Environment F- Level of Fidelity	Levels of the Simulation Fidelity may vary across different simulations (Note: Low Fidelity does not necessarily mean low teaching/learning effectiveness, and vice versa.) • LOW Level of Fidelity ▼▲▲E → ▼F • LOW Level of Fidelity ▲▲▼E → ▼F • HIGH Level of Fidelity ▲▲▲E → ▲F Simulation Platforms: Play Games, Role Play, Case-Based, Simulators, Learning Labs			The Debrief Room to accommodate students who took part in the actual simulation.
ASSESSMENT	Communicate and Highlight Assessment Rubrics and Criteria - Soft skills - Hard skills	Assessment based on Observation of Students' Performance of: A B C Attributes of the Profession = Behaviour + Competency			Assessment based on the Simulation Assessment Tool Others may include: - Quizzes - Reflective Journals & Reports - Post-Simulation Presentation - Video Playbacks

KEY EDUCATIONAL OUTCOMES

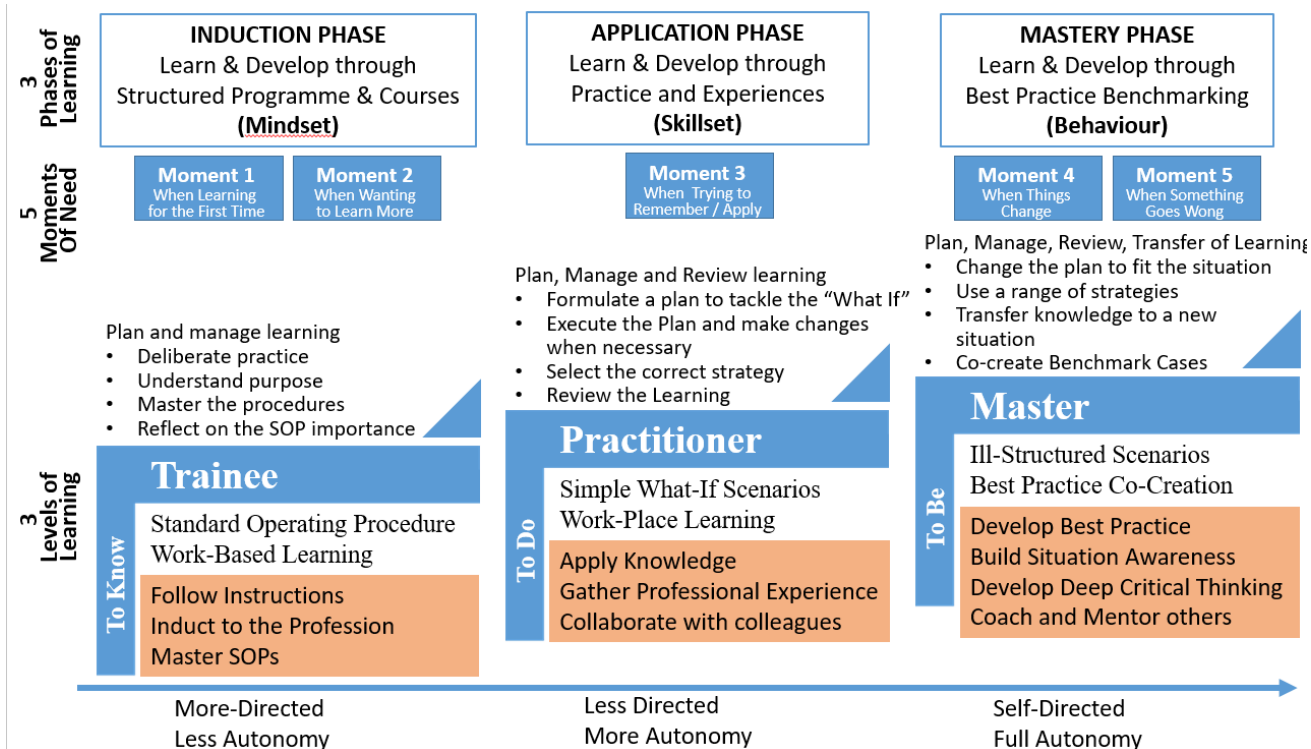
DESIRED GRADUATES' PROFESSIONAL DISPOSITIONS



- Accountable**
 - Have obligation to account for activities, accept responsibilities for actions taken and sharing outcomes in a transparent manner.
 - Hold the required amount of ownership for occurrences that follow.
- Adaptable**
 - Willing to change to suit different conditions, and is confident with one's thoughts.
 - Responsive to challenges although unfamiliar and unexpected.
- Resilient**
 - Persist in the face of adversity to get beyond familiar ideas and situations.
 - Tolerate uncertainty, keeping goals in mind, identifying obstacles toward achieving goals and finding effective ways around them.
- Collaborative**
 - Articulate and discuss ideas with openness and persuade others to achieve common outcomes.
 - Facilitate teamwork activities, provide assistance and support needed by team members with care and concern and promote ownership and commitment among team members to work goals to improve team performance.
- Solution-minded**
 - Connect or combine ideas or information from unrelated fields or applications to generate multiple ideas to bring about specific outcomes in a responsible manner.
 - Identify less-perceivable problems and use problem-solving tools and techniques to solve the problems in the pursuit of excellence.
- Self-directed**
 - Exercise self-discipline and engage in collaborative learning by discussing one's learning with others and soliciting feedback to continually improve oneself.
 - Interpret data with integrity to uncover patterns and trends between various sources of data.

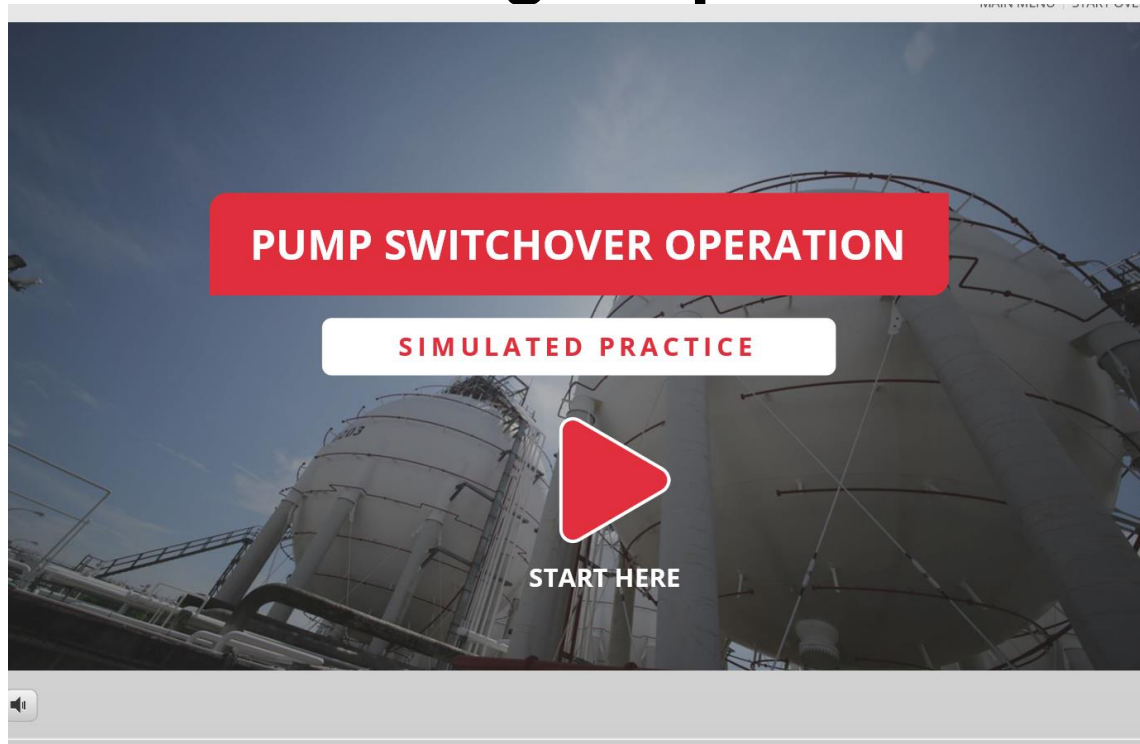


Integrating Singapore Polytechnic's Simulated Practice Framework with Gottfredson and Mosher's 5 Moments of Need





Intervention: Using Interactive Videos to meet the Learning Requirements





Why Interactive Videos?



Creates a participative experience for the learners



Helps to keep the learners' attention and keep them engaged with the learning materials longer



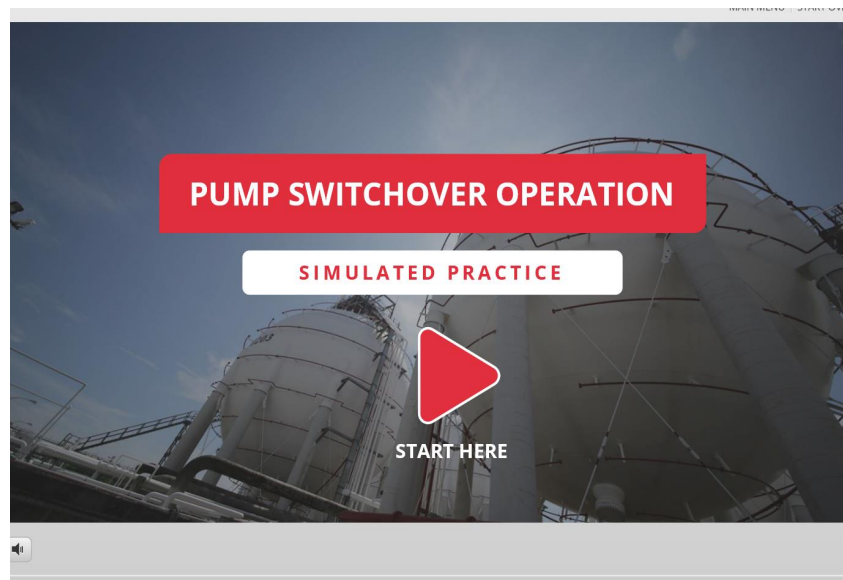
Cost-effectiveness vs fully-immersive experience



How interactive videos have been used to meet the learning requirements

1

Be embedded
Into the
work
schedule





How interactive videos have been used to meet the learning requirements

1

Be embedded
Into the
work
schedule



- Broke down key aspects of the job into micro-learning lessons.
- Leveraging on continuous workflow learning.



How interactive videos have been used to meet the learning requirements

2

Focus on skills building rather than knowledge acquisition

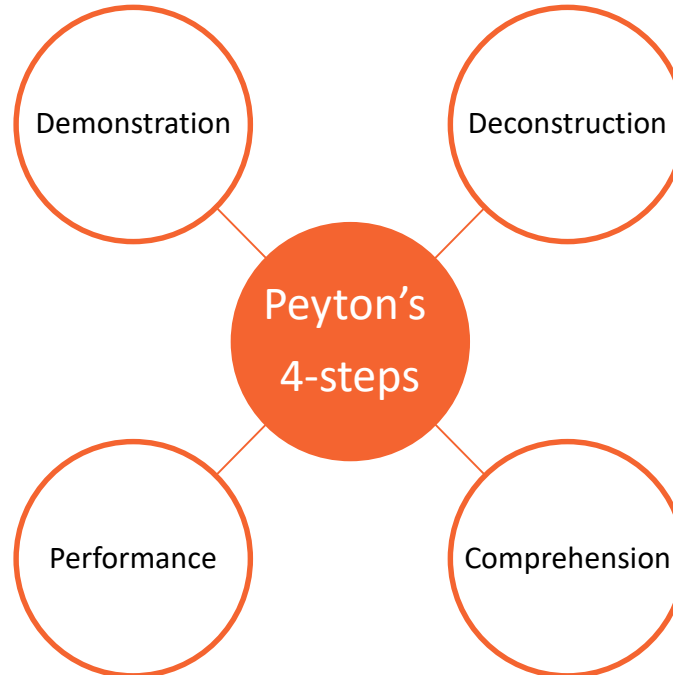
- Teaching practical skills requires using very precise instructions to enable the learner to follow the process and to repeat the skill.
- Most often this involves using both visual clues and text or audio prompts.



How interactive videos have been used to meet the learning requirements

2

Focus on skills building rather than knowledge acquisition





How interactive videos have been used to meet the learning requirements

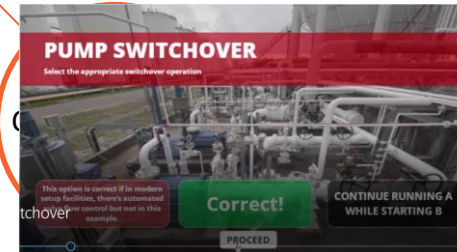
2

Focus on skills building rather than knowledge acquisition

Demonstration of the Pump Switchover



Peyton's 4-steps





MAIN MENU START OVER





How interactive videos have been used to meet the learning requirements

3

Bite-sized

The screenshot shows an interactive video interface for a task titled "ROUTINE STARTUP & PRIMING". The main heading is "PRIMING OF PUMP". Below this, a text box instructs the user: "Arrange the boxes in the right sequence of the priming process." There are four video thumbnails arranged in a 2x2 grid, each with a label: "OPEN VENT VALVE", "CHECK FLOW AND FLARE", "INFORM CONTROL BEFORE PRIMING", and "CLOSE VENT VALVE". Below the thumbnails, there are four numbered boxes (1, 2, 3, 4) for the user to drag and drop into the correct sequence. At the bottom right, there is a "SUBMIT" button. The background of the interface is a faded image of an industrial facility.



How interactive videos have been used to meet the learning requirements

4

Build critical thinking skills & help technicians to apply skills in emergency situation





MAIN MENU | START OVER



NEXT >



Future Plans



Conducting
an evaluation
study



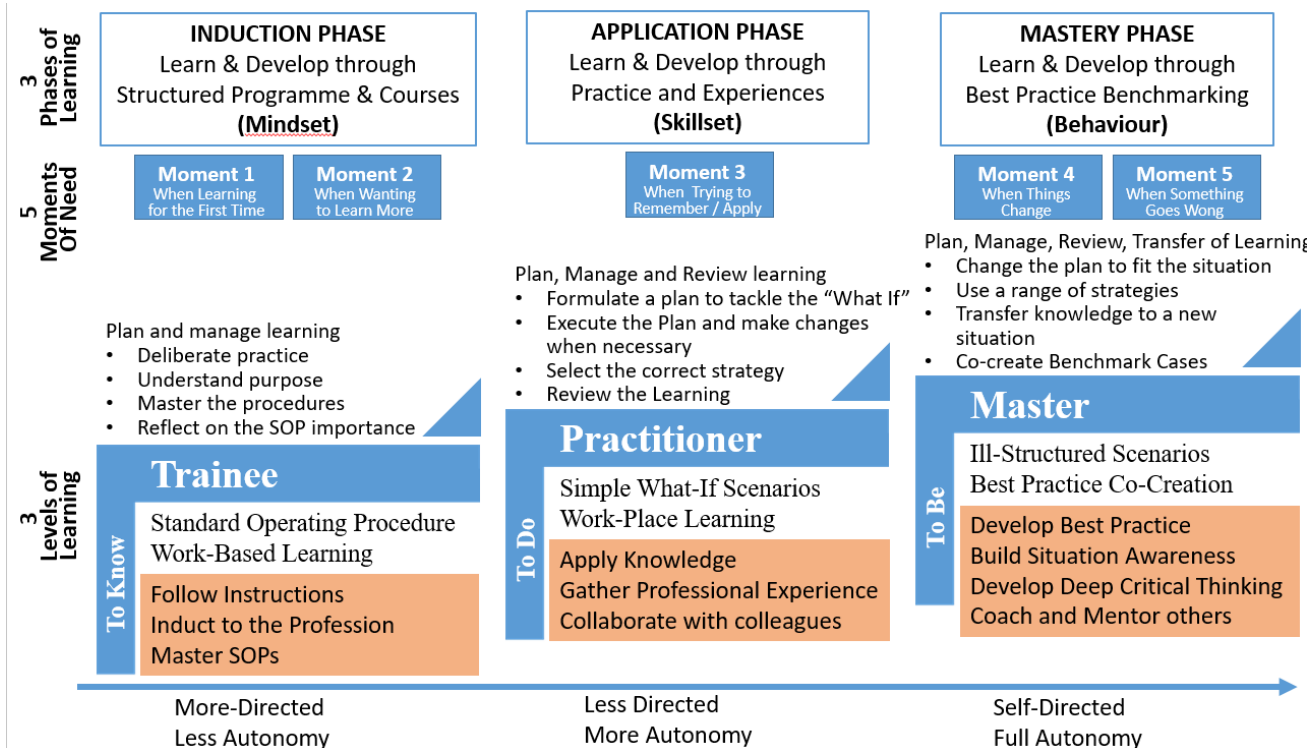
Leveraging on
other immersive
technology such
as AR and VR



Designing higher
quality and more
interactive
“What-If”
learning using
industry use
cases.



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Acknowledgements

- Deputy Principal (Dev), Mr Hee Joh Liang, Singapore Polytechnic
- Energy & Chemicals Training Centre, Singapore Polytechnic
- School of Chemical and Life Sciences, Singapore Polytechnic
- Department of Educational Development's Media Development Centre, Singapore Polytechnic



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Question & Answer