Project Summary for IAL Website

The following information is for publication on the IAL website. Please be reminded not to include any confidential information.

Project Title:	Mastery in the Digital Age: Reconceptualizing Expertise, Developing Deep Technical Mastery, and Accelerating Effective Workplace Learning
Project Number:	GA 18-01
Year of Approval:	2019
Funding Source:	WDARF
Objectives and intended outcomes of the project:	- To advance the academic field on workplace learning and expertise by conducting an ethnographic study on the impact of digitalization on the work of technical professionals - To provide practical recommendations and insights on how the Chemicals and Energy and Precision Engineering sectors have been and are transforming with digitalization - To provide related recommendations on education and workplace learning to ensure resilience for the workforce of the future - To synthesize research findings into a framework that can help organizations, policy makers, and individuals think about mastery in the digital age, and help them identify potential gaps or issues they must prepare for
Project Team	
Principal Investigator:	POON King Wang
Co-PI	Thijs WILLEMS

Summary of Project (up to 300 words)

This research explored the mastery of technical professionals when jobs and workplaces are being digitalised. The very core of what it means to be good at one's job is challenged and may fundamentally change when technology takes over crucial tasks. In the 4IR, change happens at an increasingly faster pace. However, mastery has long been understood as the step-by-step, incremental development of skills over a long period of time as individuals gradually progress from novice to expert. This poses a paradox that suggests the need to re-evaluate the meaning of mastery given the implications it has on Singapore's policies involving workforce development.

We draw on ethnographic data collected between September 2019 and April 2021, focusing on technical professionals from the Chemicals and Energy and the Precision Engineering sectors. We conducted 65 interviews, 9 focus groups, and 250 hours of observations at a Chemical Engineering pilot plant within one of Singapore's polytechnics and at two companies in the Precision Engineering sector.

Our findings show how the modern workplace involves many relationships between humans and machines, with a fluid division of labour. Technical professionals coordinate and collaborate across a network of people and technologies. To do their jobs, they need to access expertise distributed across this network. This distribution has been accelerated by the digital age, and how well professionals navigate this network reflects how deep and wide their expertise is. By identifying these specific interactions, between people-people and people-technology, that characterize the work of technical professionals, we

show how exactly expertise is distributed and what professionals can do to develop their mastery in a digital age. This is an important update to the prevalent view on mastery as a linear and incremental process, and advances both practice and literature on how workers can create robust and customized pathways to a resilient future.