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8 – 12 JULY 2023 | SYDNEY, AUSTRALIA

Designing Education to Foster Learning Health Systems

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LEARNING HEALTH SCIENCES

Centre for Digital Transformation of Health
CONNECTING DIGITAL INNOVATION TO HEALTH

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Learning Objectives

- Outline potential skills and concepts fostered in a Learning Health System (LHS) education program
- Review various methods and approaches for fostering LHS skills and concepts
- Describe challenges and strategies in the support of an education program focused on fostering LHS

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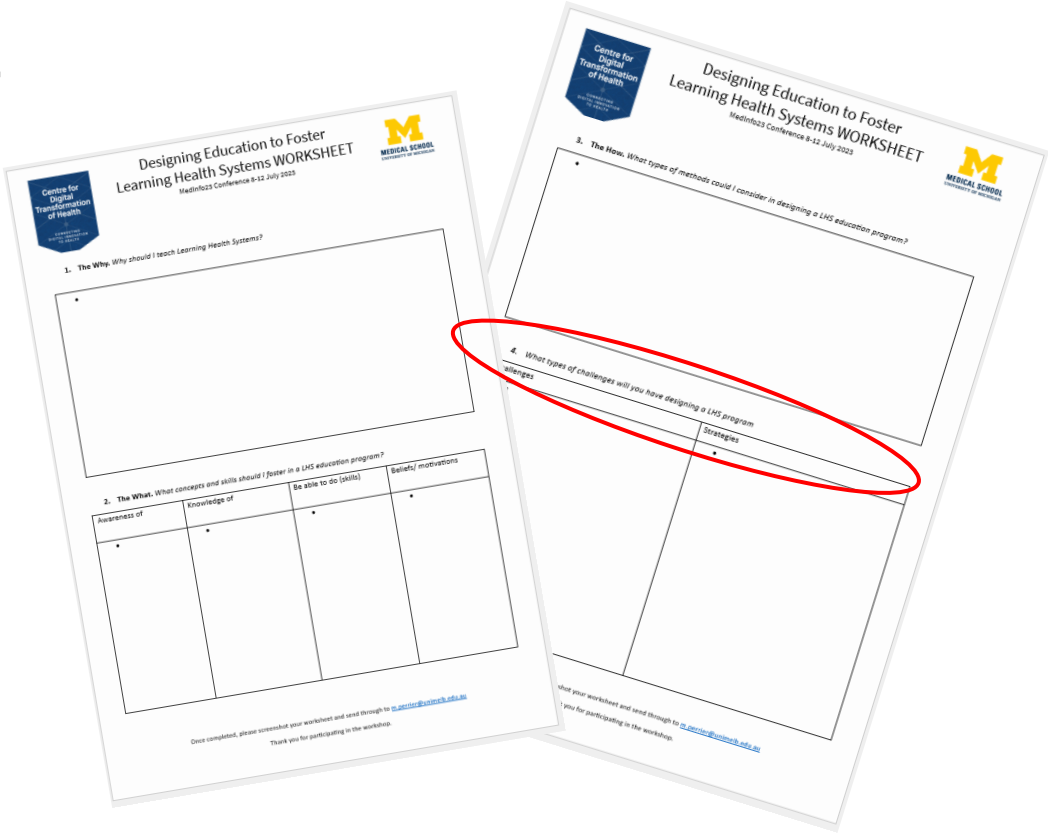
Designing Education to Foster Learning Health Systems WORKSHEET

- Simple 2-page worksheet
- Take notes as we go
- Workshop Activity (Question 4)
- Please screenshot completed worksheet at the end



A “Perfect” World for Patient Care

Who is Ms. Williams?

- 51 years old
- Married
- Grandmother
- Her daughter and grandchildren live with her and her husband
- Active in her church

- Type 2 Diabetes for 11 y, hypertension, and Chronic Kidney Disease
- Presents in clinic today for fatigue, nausea, and swollen feet/ankles

- Ms. Williams presents with fatigue, nausea, and swollen feet/ankles
- You understand her limiting factors including her social determinants of health and her treatment preferences
- You search the literature for evidence of nausea, fatigue, and swelling as possible symptoms of decreased kidney functioning and look at data from your institution and others on patients “like Ms. Williams” at the **point of care.**
- You implement a treatment plan, communicate it to the care team and family, follow-up regularly, and adjust accordingly.
- New data about Ms. Williams’ symptoms are generated and stored and reported on monthly.
- You learn from Ms. Williams, publish in the scientific literature and share your evidence with colleagues, allowing them to learn from you to help other patients like Ms. Williams.

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Learning Health System

- Collects data to generate knowledge and apply it to improve practice.
- A health system in which outcomes and experience are continually improved by applying science, informatics, incentives and culture to generate and use knowledge in the delivery of care.
- Can also improve value, reduce unjustified variation, support research and enhance workforce education, training and performance.

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Learning Health Systems (Cont'd)

- The fractal nature of an LHS means that conceptually, many of the challenges are the same, whatever the system's scale – from a small medical practice to an international health system.

- Unique and complex system of technologies, people and policies with common infrastructural elements.

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So, why develop an LHS?

- Improved patient outcomes and experience
- Provide better value healthcare
- Reduced unjustified variation in outcomes
- Generate generalizable knowledge
- Optimize the use of knowledge and evidence for decision making
- Identify and track epidemiological phenomena in real time
- Maximize the benefits of technological innovation and investment
- Expand education, training and performance to improve health and healthcare

The *Future* *Workforce* is Trans-Disciplinary and Diverse

Health Professions

Engineering

Organizational Policy

Public Health

Project Management

Informatics

Health Infrastructures and Learning Systems (HILS) Graduate Programs (Residential and Online)

- Residential Established in 2016, **Online established in 2021**
- Focused on educating LHS scientists and professionals
- Based on AHRQ LHS competencies
- Employs experiential, embedded training models
- Joint emphasis on information and social science to improve the health of individuals and populations.
- Students design, implement, and evaluate innovative change and continuous improvement in health systems.

1ST
GRAD PROGRAM
OF ITS KIND
IN THE U.S.

Agency for Healthcare Research and Quality (AHRQ)

HILS is grounded in AHRQ competencies focused on:

- A culture of continuous learning and improvement.
- Gathering and applying evidence in real-time to guide care.
- Employing IT methods to share new evidence with clinicians to improve decision-making.
- Promoting the inclusion of patients as vital members of the learning team.
- Capturing and analyzing data and care experiences to improve care.
- Continually assessing outcomes to refine processes and training to create a feedback cycle for learning and improvement.

About Learning Health Systems. Content last reviewed May 2019. Agency for Healthcare Research and Quality, Rockville, MD. https://www.ahrq.gov/learning-health-systems/about.html

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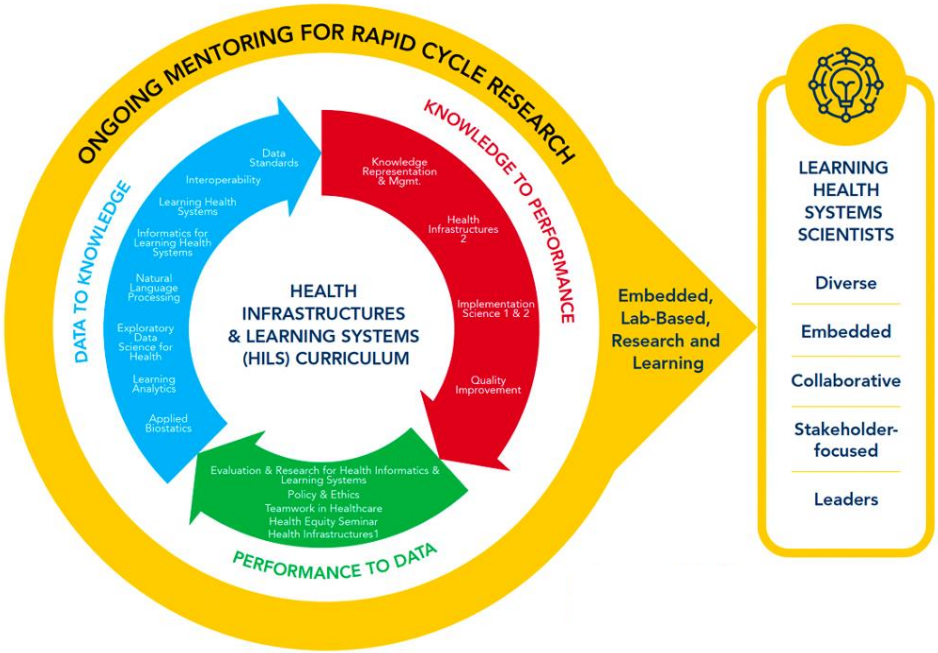

Learning Cycle Elements	HILS Courses
Performance to Data	Policy & Ethics for LHS
	Health Infrastructures
	Teamwork in Healthcare
	Evaluation and Research Methods for Health Informatics and Learning Systems
Data to Knowledge	Exploratory Data Science for Health
	Learning Cycle Informatics
Knowledge to Practice	Implementation Science in Health
	Knowledge Representation and Management
	Quality Improvement
	Learning Cycle Capstone

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71 HILS STUDENTS ENROLLED SINCE 2016
- 40 PhD
- 31 MS

CURRENTLY ENROLLED **47**
- 32 PhD
- 15 MS

28 ALUMNI
- 10 PhD
- 18 MS

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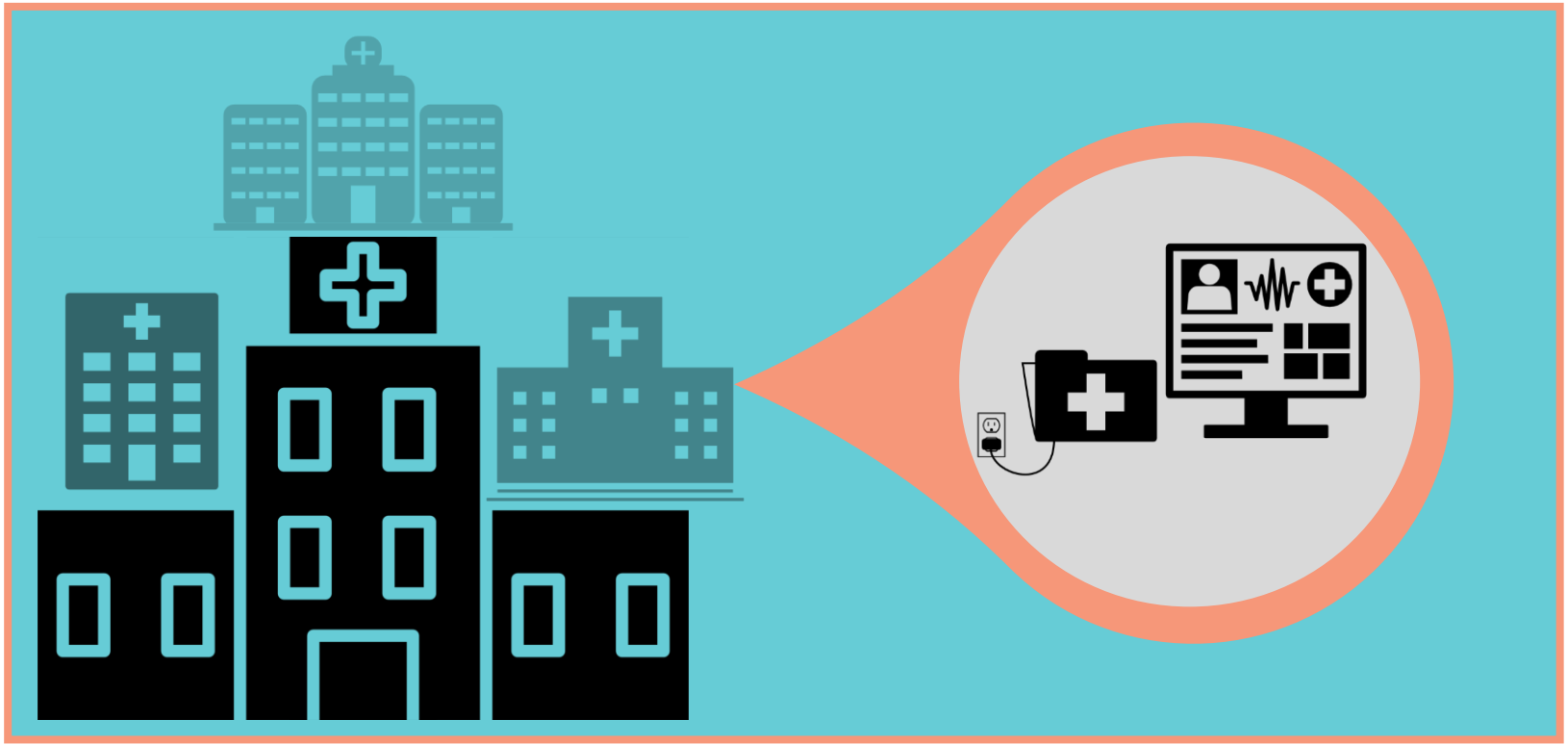

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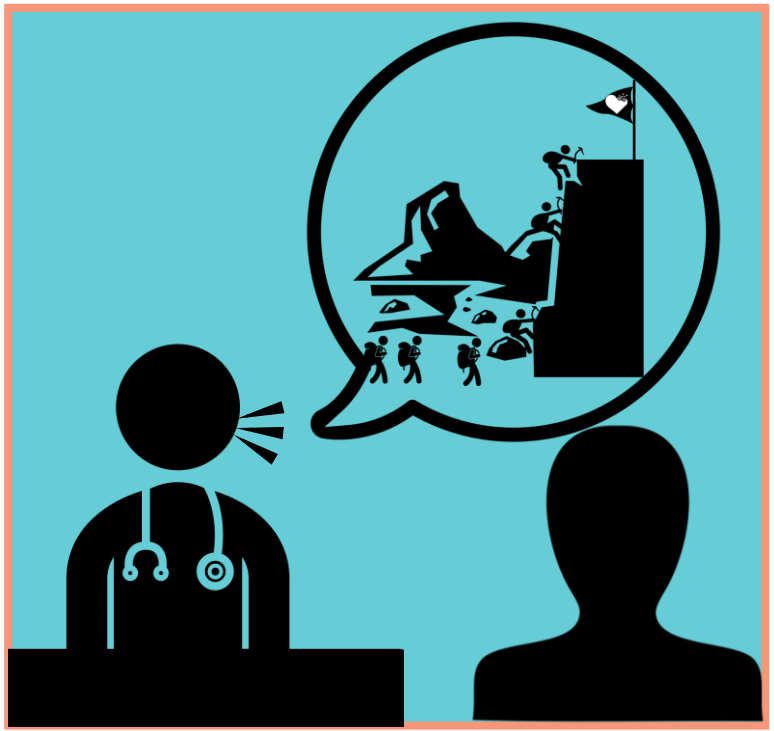
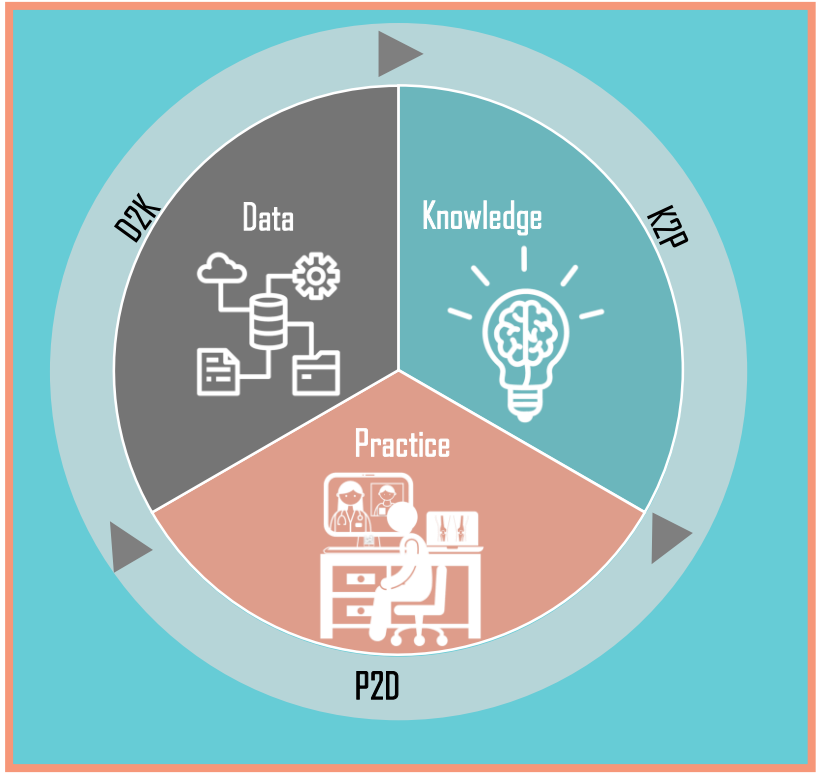
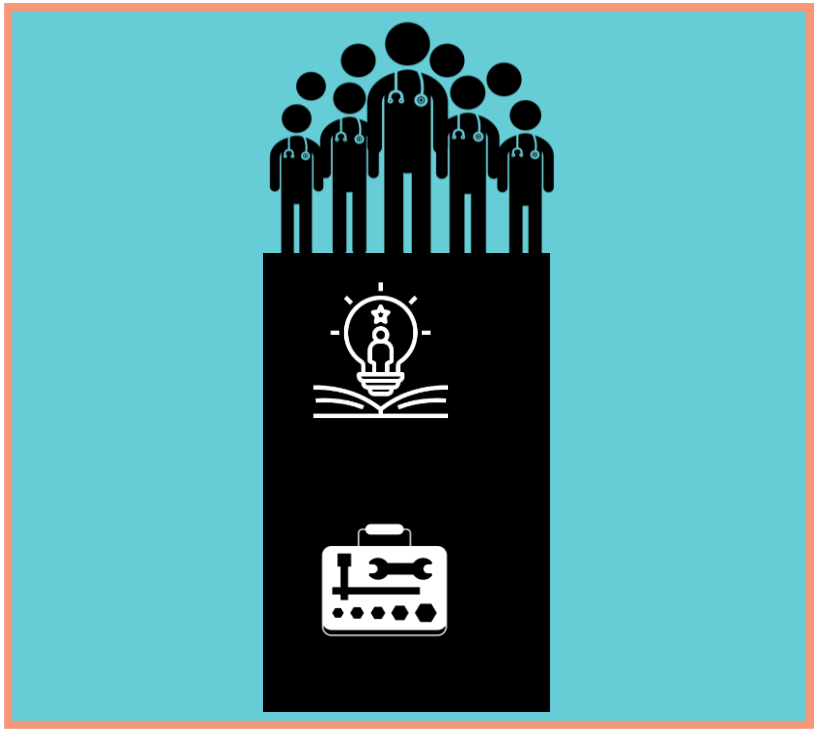


The Learning Health System (LHS) Cycle



The Applied Learning Health Systems short course



The learning model

3 hours of individual pre-class learning online

The flipped classroom

2.5 hours of in-class group work on a case study

The flipped classroom

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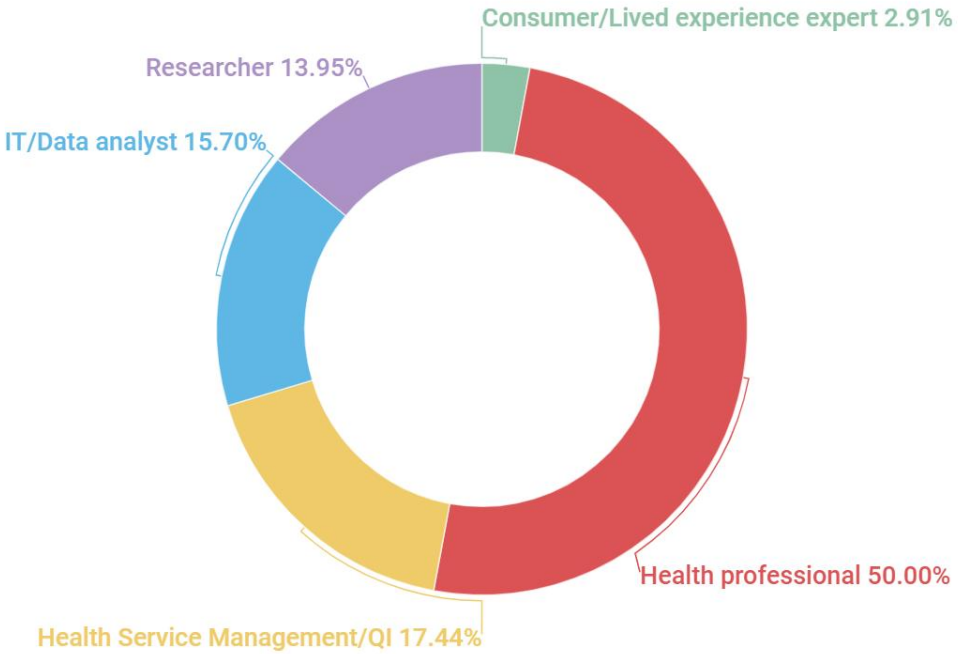
Continuing diabetes case study

Topics	1	2	3	4	5	6	7	8	9	10	11	12
	Identify the data problem & establish a learning community	Empathise with end-users and define the problem	Identify data sources & digital phenotype	Data transformation & preparation	Data analysis	Identify & clarify the problem. Design a digital health solution.	Map & specify solution components	Prototype, develop, test solution	Identify & clarify the problem. Design an evaluation plan	Implementation of intervention	Planning for transformation	Application to real world settings

What is their background?



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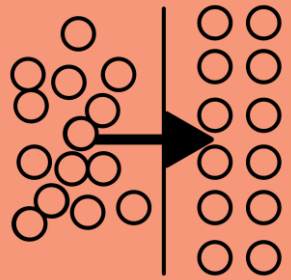
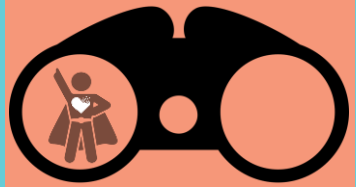
Themes arising from participant interviews – course outcomes



Organise knowledge

Common language

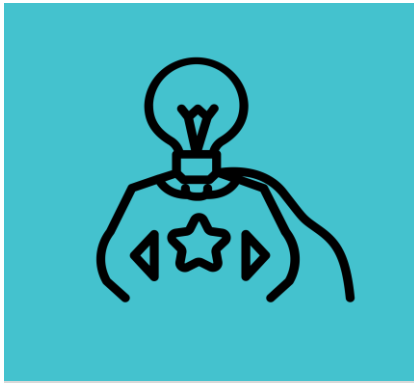
New lens



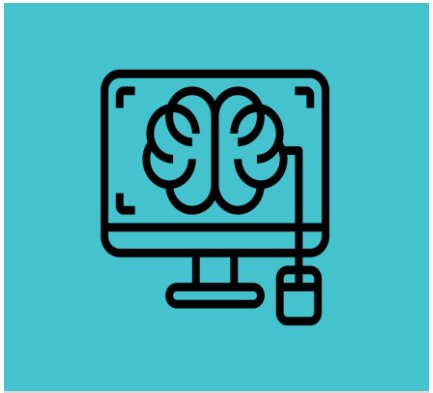
See the future

Toolkit

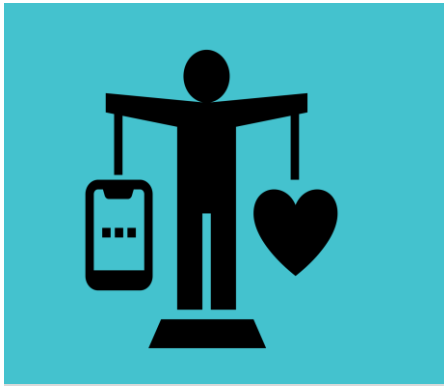
The Learning Health Systems Academy



To develop new **leaders and champions** in digital health and informatics

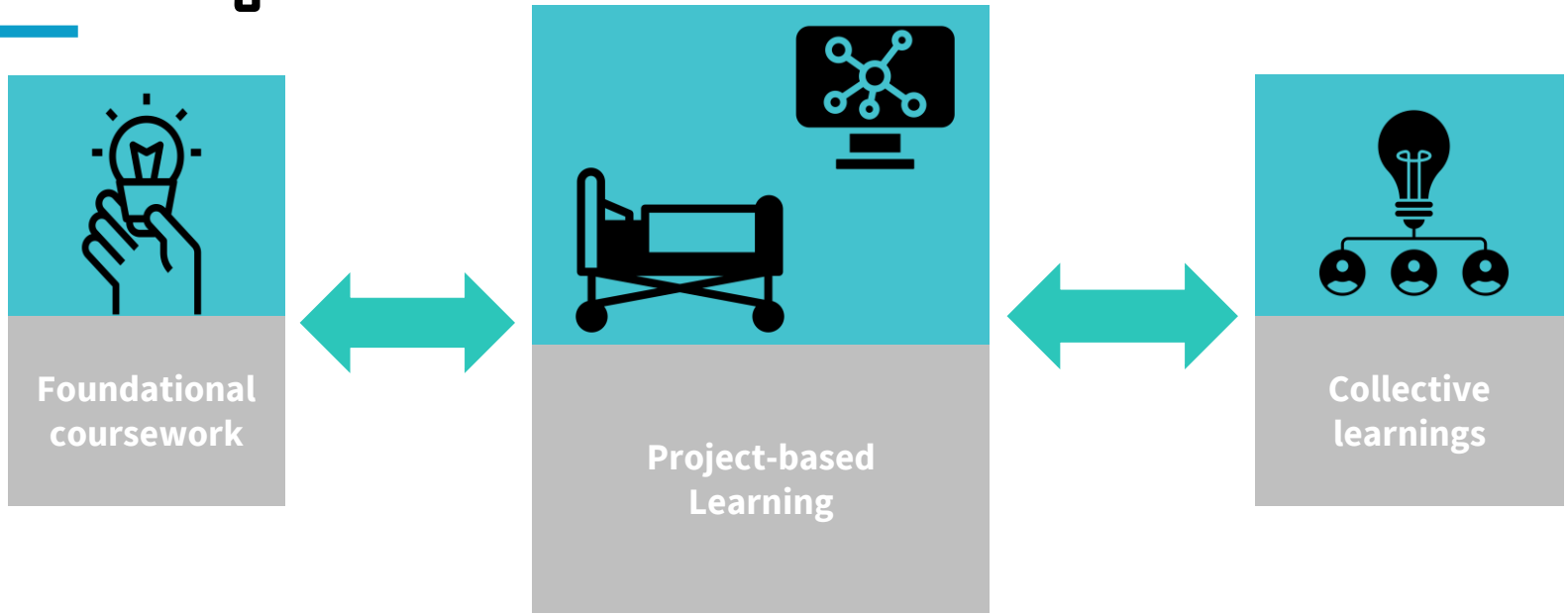


Accelerate digital transformation of health at local institutions and the national level

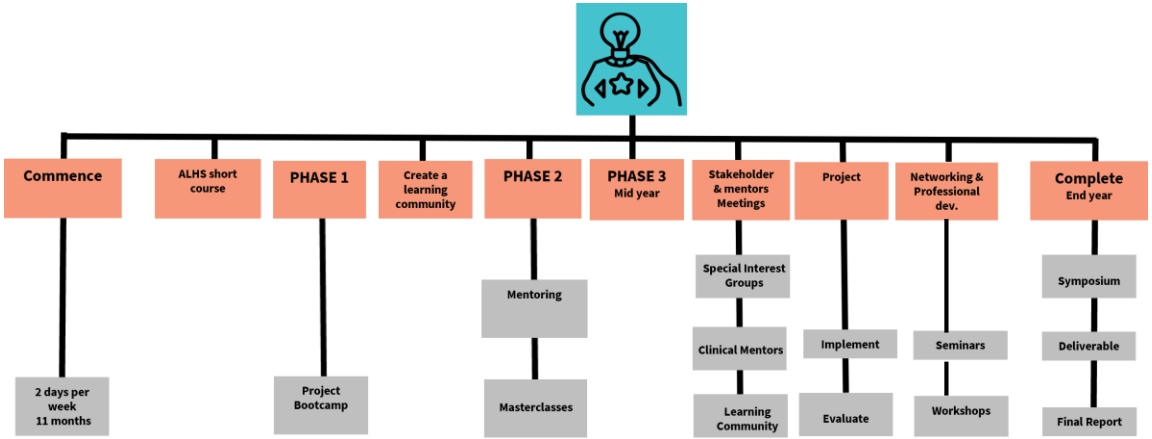


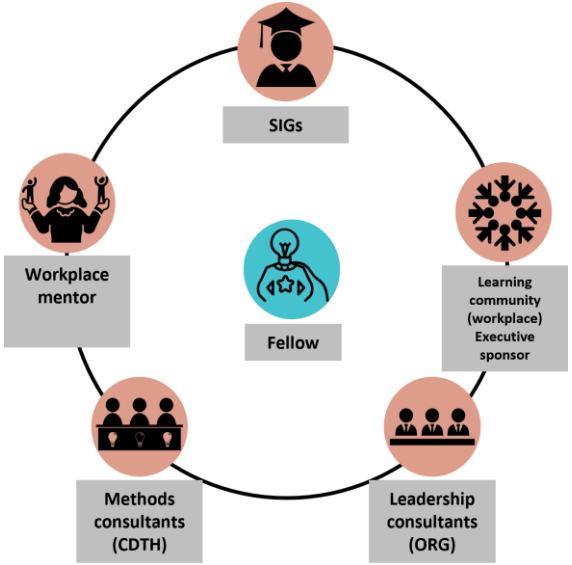
Foster skills and future capacity to **lead data driven & digitally-enabled projects** in their workplace

The Learning Model

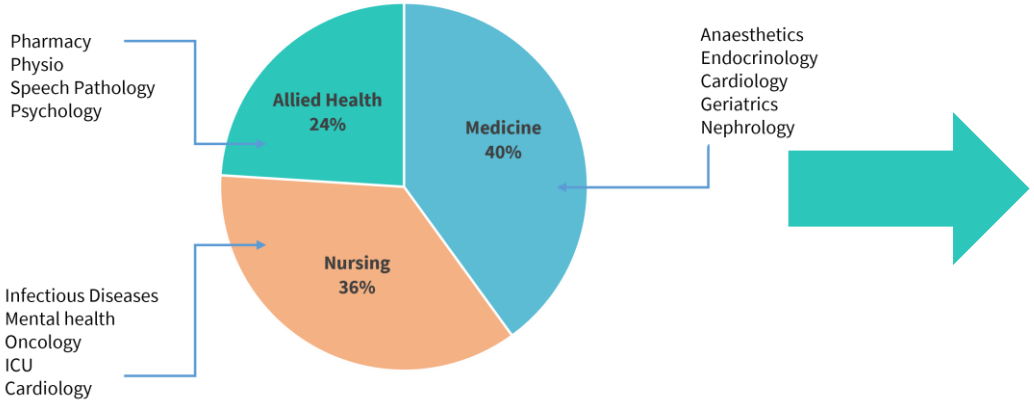


The Learning Model





Program snapshot



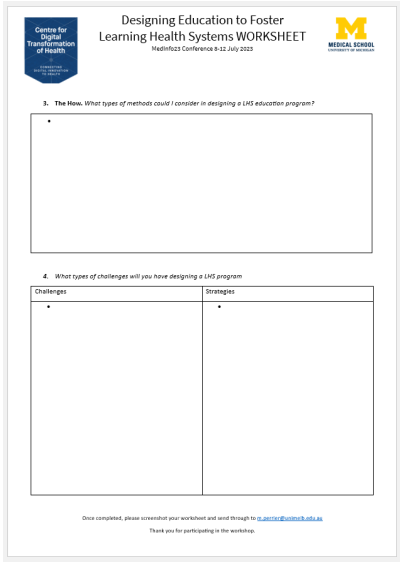
Job Title	Project Title
Grade 3 Physiotherapist	Light at the end of the tunnel: VRSS & TRAMS Patient Portals
Consultant Geriatrician	Embedding optimal frailty assessment, care and follow up for older persons undergoing elective surgery.
Manager, Allied Health Informatics	The Tyranny of Distance. How big is it and what should we do? Examining access to Ambulatory Care across Grampians Health with a view towards equity through digital health innovation.
Pharmacist, GHS at home	Identifying current processes in the discharge prescription pathway to inform a data-driven solution
Academic GP Registrar	MenoPROMPT: codesign of an intervention to support women with menopause in general practice
Senior Speech Pathologist	Implementation of an e-Health monitoring initiative in the Progressive Neurological Disorders Clinic at Northern Health
Mental Health Liaison Nurse	Improving management of clinical aggression on oncology wards
Cancer Nurse Researcher	Routinising collection of social determinants of health data through a digital solution to understand and target unwarranted variation in health outcomes
Nurse Practitioner	Sepsis Pathway Workflows for Cancer patients
Research & Evaluation Co-Ordinator	Optimiatised care team collaboration via EMR for Adolescent Eating Disorders
Consultant Cardiologist	A 12 week post-acute, virtual based model of care for heart failure patients
Lead Mental Health Pharmacist	Refining and optimising Long-Acting Injectable Antipsychotic preparation and delivery
Q&I Lead, Physiotherapist	Neurosurgery waitlist reduction with an artificial intelligence (AI)-based screening process
Advanced Trainee, Nephrology	Data-driven improved management of acute kidney injury during inpatient care
ICU Nurse Practitioner	Optimising the Deteriorating Patient Alert Dashboard (DPAD) for Medical Emergency Team (MET) Syndromes

Emerging Themes from participants

Key **strategy** in working with a diverse range of stakeholders – effective networking

Activity: How do Learning Health Systems fit into your work?

- Worksheet provided
- Describe **CHALLENGES**
- Identify **STRATEGIES**
- Share your key **TAKEAWAYS**



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Designing Education to Foster Learning Health Systems WORKSHEET

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3. **The How.** *What types of methods could I consider in designing a LHS education program?*

•

4. *What types of challenges will you have designing a LHS program*

Challenges	Strategies
•	•

Once completed, please screenshot your worksheet and send through to m.perrier@unimelb.edu.au

Thank you for participating in the workshop.

Screenshot responses and send to m.perrier@unimelb.edu.au