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Senior Health workshop: Primary data fundamentals

Dr Hugh Shannon

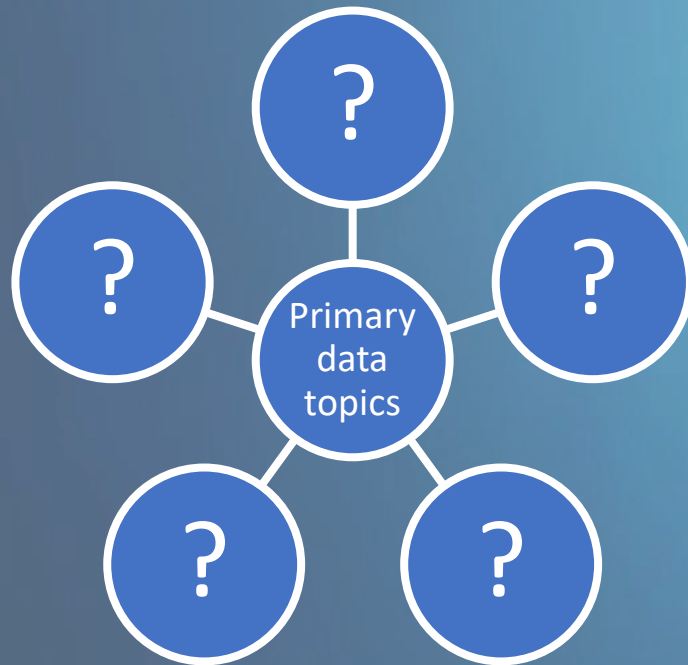
Senior Lecturer HPE, *Queensland University of Technology*
Board Member, *ACHPER Queensland*



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Primary data: Your interests & students

ACTIVITY 1

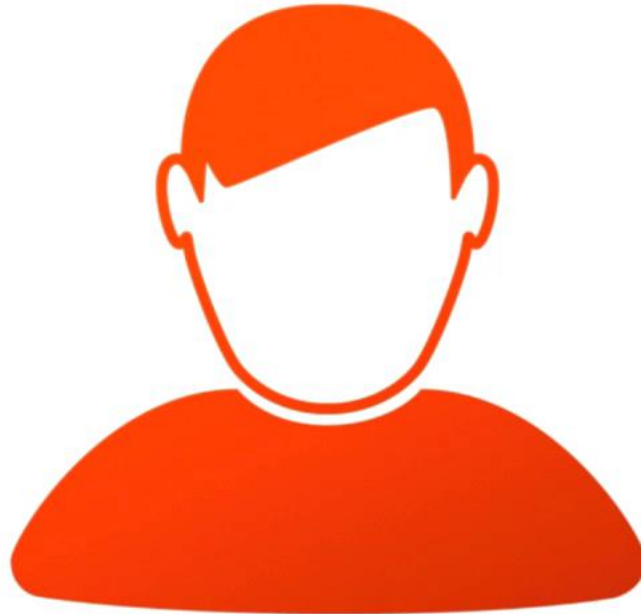


ACTIVITY 2

Adjectives describing student...

- *Skills*
- *Attitude & effort*
- *Confidence*

Senior Health community & my background



Workshop overview

1. Primary data collection

- Functional health literacy, readability assessment (FKGL testing)
- Determining minimum participant numbers (sample size calculation)

2. Quantitative data analysis

- Measures of central tendency & variability
- Benefits of coupling standard deviation with mean
- Spreadsheet formulae

3. Qualitative data coding & analysis

4. Supplementary resources & final discussion

Data literacy

Inquiry driven **primary** research commands a range of skills: *planning, management, analysis & communication.*

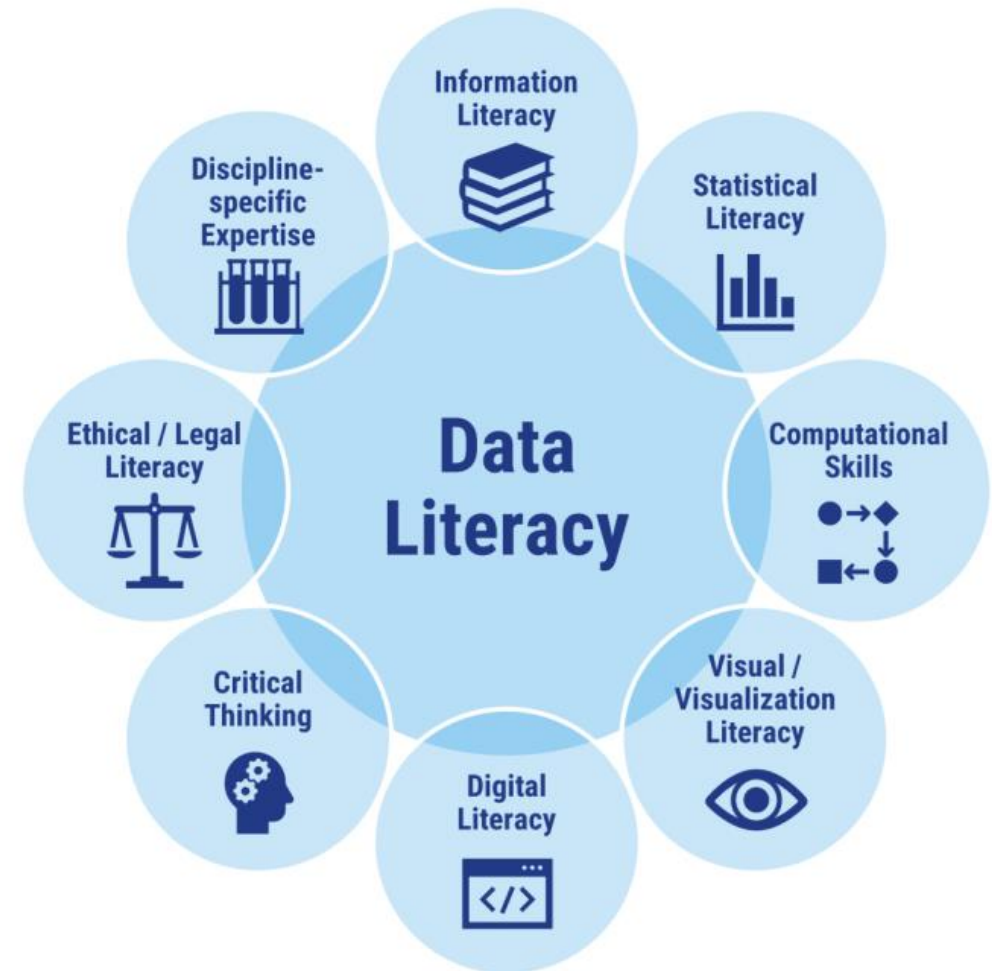


Diagram source: <https://www.dataliteracy.uni-jena.de/en/what-is-data-literacy>

Primary data collection



Functional health literacy & readability assessment



*When your students engage in health communication or primary data collection (e.g. via action research) do they consider the potential **literacy needs** and **functional health literacy** of the target group?*

How do they determine and accommodate the potential needs of the target group?

Functional health literacy & readability assessment



- **Readability assessment** provides an opportunity to evaluate the complexity of written text and therefore suitability for a target audience
- **Flesch-Kincaid Grade Level (FKGL) testing** offers an efficient method for assessing readability

Flesch-Kincaid Grade Level (FKGL) test

$$\text{FKGL} = (0.39 \times \text{ASL}) + (11.8 \times \text{ASW}) - 15.59$$

Where...

- *'ASL' represents average sentence length*
- *'ASW' represents the average number of syllables per word*

- FKGL test administered using proofing tools within Microsoft Word software
- Review tab > Spelling & Grammar check > Editor window (Insights: Document stats) > Readability FKGL

ACTIVITY:

Open a Word document and check FKGL

Determining minimum participant numbers

Sample size calculation:

- Efficient use of resources
- May not be possible to manage a large volume of data (realistic for the context)
- Identifying the minimum required to have confidence in the results



Determining minimum participant numbers

ACTIVITY – Performing a sample size calculation:

- **What is the target group?** Describe them & estimate the target population size (N=?)
- **What is the minimum sample size required?** Complete a sample size calculation using the online ABS calculator

ABS website:

www.abs.gov.au/websitedbs/D3310114.nsf/home/Sample+Size+Calculator

ABS online calculator: <http://tinyurl.com/y4csfavd>

The screenshot shows the ABS online Sample Size Calculator interface. At the top, there is the Australian Bureau of Statistics logo and a search bar. Below that are navigation tabs for Statistics, Census, Complete your survey, and About us. The main heading is "Sample Size Calculator" with a note: "Please Note: This calculator should be used for simple random samples only". The interface is divided into two main sections: "Determine Sample Size" and "How do I use it?". The "Determine Sample Size" section has several input fields: "Confidence Level" (set to 95%), "Population Size", "Proportion", "Confidence Interval" (with radio buttons for "Upper" and "Lower"), "Standard Error", "Relative Standard Error", and "Sample Size". Each input field has a blue information icon to its right. At the bottom of this section are "Calculate" and "Clear" buttons. The "How do I use it?" section contains a numbered list of instructions and links to "Sample Size Calculator Help", "Sample Size Calculator Definitions", "Sample Size Calculator Examples", and "Sample Size Calculator Stratification Examples".

Recommended settings:

- Confidence Level 95%
- Proportion 0.75
- RSE 10

Click on the blue information icon next to each of these inputs to develop your understanding of the terms.

Determining minimum participant numbers

Do your students collect pre and post primary data?

- Time series study design



Figure 1. Action research timeline including baseline, impact & follow-up data collection stages

Determining minimum participant numbers

Inflation factor:

Aim to exceed the minimum (within reason). This is particularly important for time-series study designs as the calculated sample size is the number of participants required to complete all time points (allowing for time point absence and the ethical option to withdraw from participation).

Determining minimum participant numbers

Extension activity – Applying an inflation factor:

- If you are utilising a time series study design, your 'n' value is the minimum number of people that must complete all time points
- We need to account for attrition: people who may be absent or choose not to complete T2 and/or T3
- We can prepare for this situation by applying an inflation factor

Example 1 – Two time points:

If we are aiming for 70% of the starting group to complete T2, our inflation factor is $1.3 \times 'n'$

Example 2 – Three time points:

If we are aiming for 70% of the starting group to complete T2 and T3, our inflation factor is $1.3 \times 1.3 \times 'n'$ or $1.69 \times 'n'$

Primary data analysis



ACTIVITY:

- 1. INDIVIDUAL TASK:** Take a sticky note, write your favourite colour and a brief reason on it, then stick it on the wall
- 2. GROUP TASK:** What descriptive data can we extract? Sort the sticky notes to manage and analyse the data
 - *Apply quantitative methods*
 - *Apply qualitative methods*



Quantitative data analysis

Measures of central tendency

- Mean
- Median
- Mode

Measures of variability

- Range
- Standard deviation (quantifies variability or dispersion)

EXAMPLE & DISCUSSION ACTIVITY:

Five-point Likert scale

Strongly Disagree (SD)	Disagree (D)	Neutral (N)	Agree (A)	Strongly Agree (SA)
1	2	3	4	5

Q1. What will be the mean if five people provide a Neutral (N) response?

Q2. What will be the mean if five people respond, each selecting a different option within the scale? (SD x1, D x1, N x1, A x1 & SA x1)

Consider the importance of coupling standard deviation with mean!

Quantitative data analysis

Sample time series dat

	A	B	C	D	E	F
1			Item 1			Item
2	Participant	T1	T2	T3	T1	T2
3	P1	3	4	4	3	3
4	P2	2	4	3	5	5
5	P3	2	5	4	2	3
6	P4	3	3	4	4	4
7	P5	3	4	4	3	3
8	P6	3	3	3	3	2
9	P7	4	3	3	1	4
10	P8	3	4	3	2	4
11	P9	3	5	4	3	4
12	P10	3	4	4	3	4
13	Mean				2.90	3.60
14	SD				1.10	0.80
15						

Function Argument
=SUM(A1:A10)

A range of cells has a starting cell, colon, and an ending cell. When you select a range of cells for a formula, Excel will automatically add the colon.

Examples of functions:

=SUM

=AVERAGE

=COUNT

=STDEV

=MIN


=MAX

ACTIVITY:

1. Download the sample MS Excel file <https://>
2. Set up formulae to calculate mean and standard deviation for Item 1 (T1, T2 & T3)
3. Discuss the results & process – *Potential foci: standard deviation (SD) is a measure of variability & consider how students may interpret results (e.g. the mid-point for this scale is 3 not 2.5)*

Qualitative data coding & analysis

- **Systematically extracting meaning from text** (e.g. interview transcripts, focus group transcripts, written questionnaire responses & field observation notes)
- Analytical process of **coding** (labelling), organizing, sorting & synthesising qualitative data to enable **identification of significant themes**
- Coding involves assigning a word, phrase, number or symbol to the associated text (labelling process)



ACTIVITY:

1. Download the sample MS Word file <https://>
2. Use text highlight or comment insertion functions to code the sample text
3. Discuss the process

Your samples & identified topics of interest

1. Would you like to discuss your own samples of primary data, research instruments or assessment?
2. Are there topics of interest identified earlier requiring discussion?

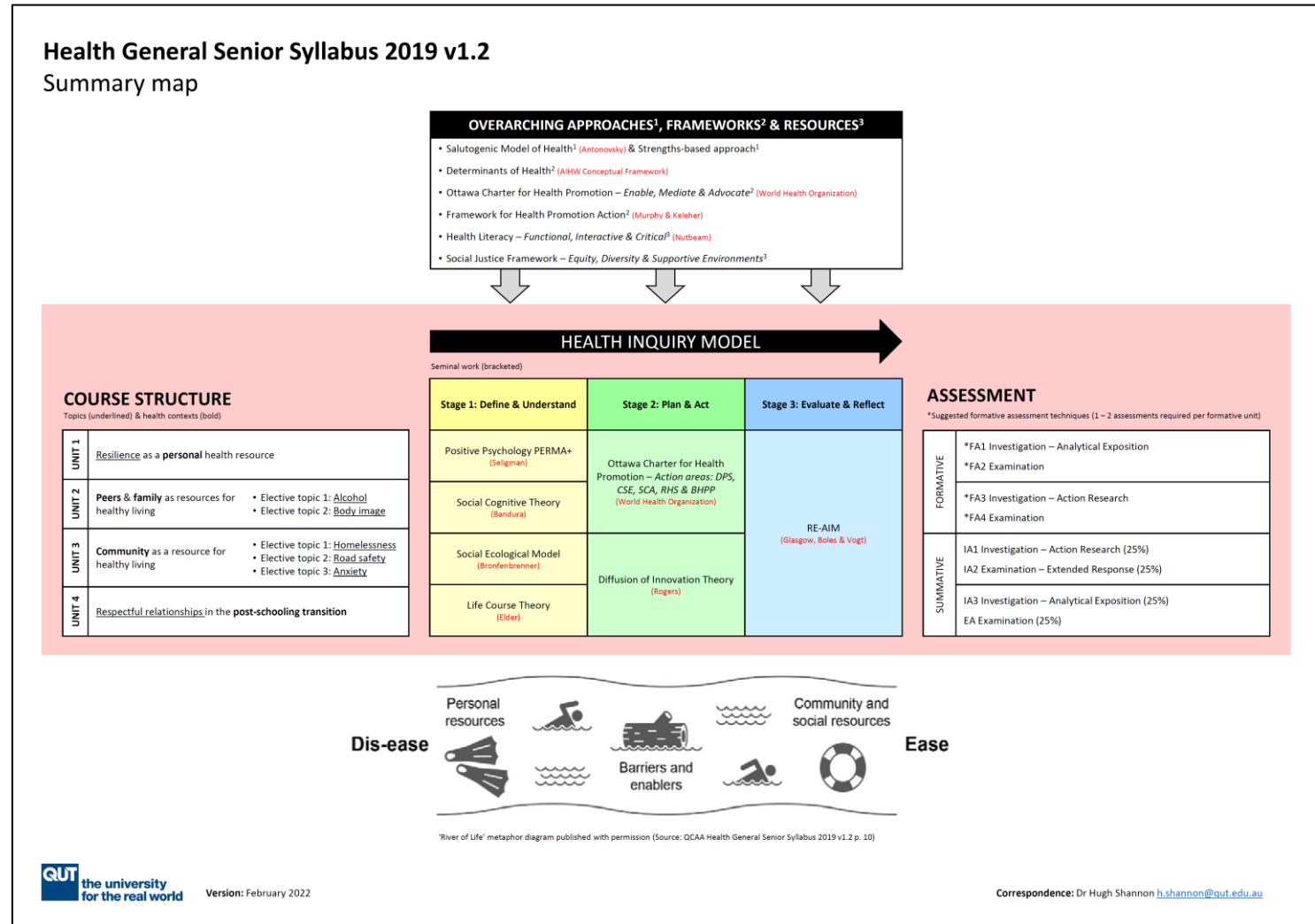
Supplementary resources & final discussion



Supplementary resources

1. Syllabus summary map:
<https://>

2. Research instrument tips:
<https://>



Higher degree qualifications

If you could gain a Masters level qualification (AQF 9) at no financial cost, would you be interested?



AQF qualification list – Source: <https://www.aqf.edu.au/framework/aqf-qualifications#toc-aqf-level-9-masters-degree-2>

AQF qualifications

- AQF specification for the Senior Secondary Certificate of Education
- AQF Level 1 – Certificate I
- AQF Level 2 – Certificate II
- AQF Level 3 – Certificate III
- AQF Level 4 – Certificate IV
- AQF Level 5 – Diploma
- Level 6 – Advanced Diploma, Associate Degree
- AQF Level 7 – Bachelor Degree
- Undergraduate Certificate
- Level 8 – Bachelor Honours Degree, Graduate Certificate, Graduate Diploma
- AQF Level 9 – Masters Degree
- AQF Level 10 – Doctoral Degree

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au.linkedin.com/pub/hugh-shannon/65/a61/791/

**Thank you for your
contribution today!**

Please take a moment to provide
feedback via this QR code.



Please stay for further questions and discussion

Further questions or discussion?

