Ollscoil Teicneolaíochta an Atlantaigh

Atlantic Technological University

Reimagining Assessment-

Dr. Trish O'Connell

ATU Galway City Campus

Agenda

1. Context
2. Reimagining Assessment – Twin Focus
3. Learning Oriented Assessment
4. The Workshop Activity in Moodle
5. Year 2 Authentic assessment
6. Year 3 Authentic Assessment

Context

Lecturer in Mathematics & Statistics for Medical Science for

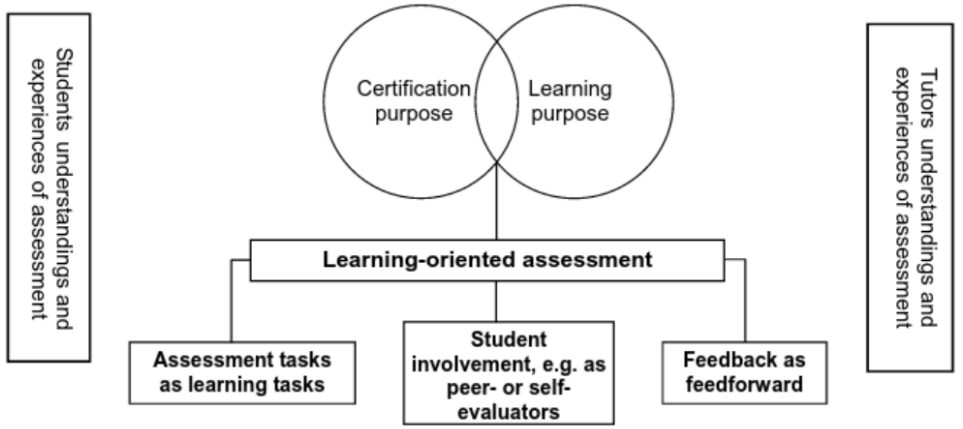
- Year 1
- Year 2
- Year 3

Statistics advisor for

- Year 4

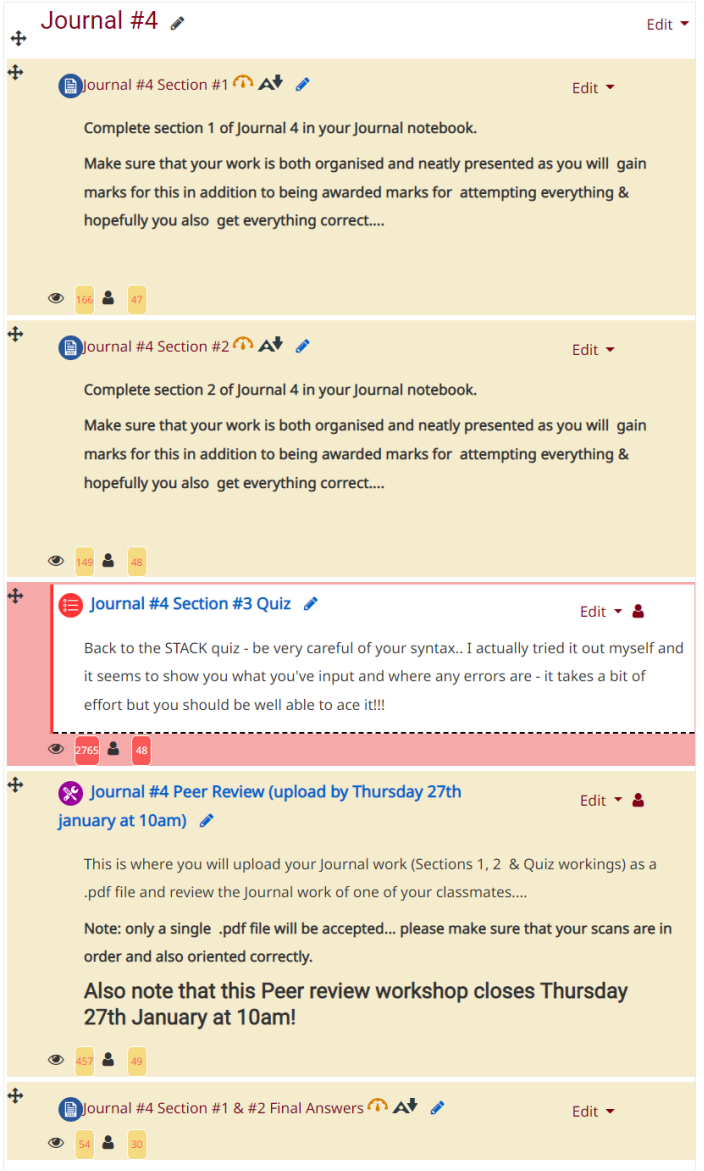
Reimagining Assessment

- LOA
- Authenticity



Learning Oriented Assessment

The Workshop Assessment Activity



The Workshop Assessment Explained

SECTION 1

LINEAR, NON-LINEAR & QUADRATIC EQUATIONS

Q1. Solve the following linear equations:

(a) $\frac{2x+5}{x+4} = 1$

(b) $5 - 2(x - 1) = 4(3 - x) - 2x$

Q2. Solve the system of equations:

(a) $x + y = -1$

$x^2 + y^2 = 13$

(b) $x - y = -1$

$y = x^2 + 1$

Q3. Solve the following quadratic equations:

(a) $x^2 - 10x - 2 = 0$

(b) $x + \frac{1}{x} = 3$

Complete, Scan & Upload

Solutions & Peer Review

Assessment
by [redacted]
Grade: 6.00 of 8.00

Assessment form

Criteria	Levels		
Section 1 Worksheet	Less than 50% attempted (0 marks)	Between 50% and 99% attempted (1 marks)	100% completed attempted & also correct (2 marks)
Section 2 Worksheet	Less than 50% attempted (0 marks)	Between 50% and 99% attempted (1 marks)	100% completed attempted & also correct (2 marks)
Working out for Quiz section	Less than 50% attempted (0 marks)	Between 50% and 99% attempted (1 marks)	100% completed - attempted & also correct (2 marks)
Neatness & professionalism	Illegible very disorganised and messy (0 marks)	barely legible disorganised could be improved (1 mark)	very neat well organised (2 marks)

Weightings:

Attempt:53.3%

Peer Review :13.3%

Quiz: 33.3%

Gradebook

Journal #4 Section #3 Quiz	90.00	90.00 %
Journal #4 Peer Review (upload by Thursday 27th january at 10am) (submission)	5.00	62.50 %
Journal #4 Peer Review (upload by Thursday 27th january at 10am) (assessment)	2.00	100.00 %
Journal#4 Final Grade	3.19	76.61 %

Atlantic Technological University

Authenticity Year 2

Example 1

- An identical assay was carried out in two labs with results as follows:

Lab A	2.18	3.17	2.46	2.7	2.78	3.35	3.52
Lab B	3.13	3.07	3.92	3.51	2.92		

- Is there a significant difference between the two labs?
- Alpha = 5%

"I'd love it if this was a year-long module for us!"

"I really enjoyed everything about this module."

Year 2 Assessment

10% Weekly Lab Average
20% Mid term Assessment
70% Final exam

WORKSHEET 1

Two-Sample T-Test and CI: Lab A, Lab B

Method

μ_1: mean of Lab A
μ_2: mean of Lab B
Difference: $\mu_1 - \mu_2$

Equal variances are not assumed for this analysis.

Descriptive Statistics

Sample	N	Mean	StDev	SE Mean
Lab A	7	2.880	0.487	0.18
Lab B	5	3.310	0.404	0.18

Estimation for Difference

Difference	95% CI for Difference
-0.430	(-1.014, 0.154)

Test

Null hypothesis $H_0: \mu_1 - \mu_2 = 0$
Alternative hypothesis $H_1: \mu_1 - \mu_2 \neq 0$

T-Value	DF	P-Value
-1.67	9	0.130

Q1. The distribution of serum levels of Magnesium in a certain population is approximately normal with mean 300 µg/dL and standard deviation 20µg/dL.

(a) Find the probability of observing a member from this population with a test result:

(i) less than 330 µg/dL; **[10 marks]**

(ii) that is 250 µg/dL or less; **[4 marks]**

(iii) between 275 and 335 µg/dL **[10 marks]**

(b) Calculate the 90% reference interval for the serum hormone results, correct to one decimal place **[10 marks]**

(c) Determine how high the serum levels of Magnesium in a member of this population would need to be to be in the top 20% of the population. What percentile is this? **[10 marks]**

QUESTION 4 ***[TOTAL MARKS: 25]***

A study was conducted to investigate the effectiveness of calibration on a blood gas analyser. Samples were taken and run for pH values and following calibration the samples were retested. The 'before' value was carefully matched to the 'after' value.

Patient	A	B	C	D	E	F	G	H
Before	6.60	6.50	9.00	10.30	11.30	8.10	6.30	11.60
After	6.80	2.40	7.40	8.50	8.10	6.10	3.40	2.00

Q 4(a) **[4 Marks]**
State clearly the null and alternate hypotheses for this scenario

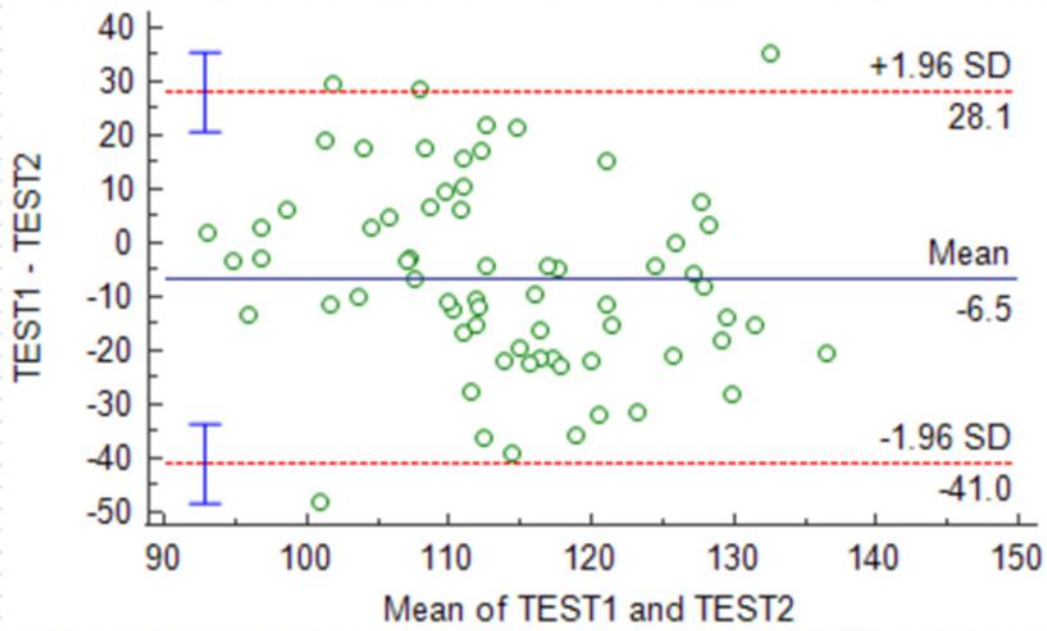
Q 4(b) **[6 Marks]**
Calculate the mean difference and the mean standard deviation for this data

Q 4(c) **[9 Marks]**
Conduct an appropriate test to determine whether calibration had any effect on the data.. Test at a 5% significance level

Authenticity Year 3

Method Comparison – Bland Altman Plot

Difference between the two methods



Average of the two methods

STATISTICAL METHODS FOR ASSESSING AGREEMENT BETWEEN TWO METHODS OF CLINICAL MEASUREMENT by J.Martin Bland & Douglas G.Altman

38 38

Year 3 Assessment

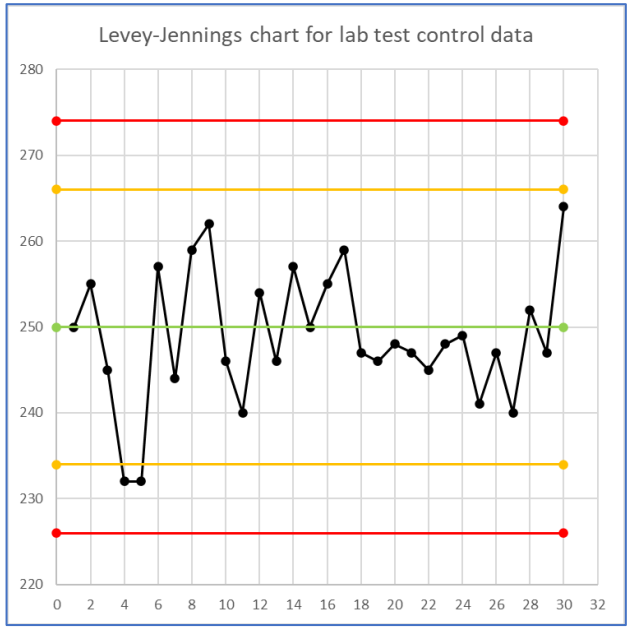
Mean values obtained from different groups with different conditions are frequently compared in clinical studies. For example, two mean ESR rates using different methods may be compared using the parametric Student's *t* test when independent groups are subjected to the comparison under the assumptions of normal distribution and equal variances (or standard deviation).
In a recent ESR sedimentation rate test the following data was collected:

Method 1	Method 2	Method 3
23	22	19
20	19	18
21	20	21
22	24	20
20	25	19
19	22	22

Q 4(a) **[6 Marks]**
Using a 5% significance calculate the resulting Type I error you would get if **four** groups were compared using the Student t test

Q 4(b) **[4 Marks]**
State clearly the null and alternative hypothesis being tested in this ANOVA

Q 4(c) **[8 Marks]**
Find the 'within and 'between' estimates of variance, correct to three decimal places



Atlantic Technological University

Feedback

"This module really relates to the job of a Medical scientist. Good to get an insight into an area which might be overlooked by students because other subjects are mostly theory based. Nice break to deal with numbers rather than words!"

Ollscoil Teicneolaíochta an Atlantaigh

Atlantic Technological University

Thank you!

Ollscoil
Teicneolaíochta
an Atlantaigh

Atlantic
Technological
University