

# Online and on-time — the transformation of a nursing numeracy program

WESTERN SYDNEY  
UNIVERSITY



Adelle Colbourn, Susan McGlynn,  
Jim Pettigrew, Leanne Rylands,  
Lyn Armstrong, Don Shearman,  
Merryn Horrocks

Mathematics Education Support  
Hub (MESH)

Western Sydney University





# **Western Sydney University**

## **MESH**

### **Western Sydney University**

- Multi-campus, across greater Sydney.
- Nursing & Midwifery degree course is offered on four campuses.
- Around 1500 first-year nursing and midwifery students.
- The course assumes commencing students have basic numeracy skills.

### **MESH (Mathematics Education Support Hub)**

- Seven staff, four are part-time, just over five full-time equivalent.
- Work from three campuses.

# Nursing numeracy workshops: f2f

## Pre-covid (up to and including 2019)

- Target audience: Nursing & Midwifery students who are mid-way through their first year and have been identified as having insufficient numeracy skills.
- Long-standing (with curriculum improvement made every iteration).
- Not mandatory, free, delivered as 5 hours face-to-face per day over 3 days.
- Emphasis on practical group activities with specific numeracy instruction, tutor interaction and a final lecture.
- Content available in pdf format and via the LMS.
- Pre and post tests and surveys via LMS.

# Nursing numeracy workshop: Online 2020

## Planning

- Aimed to retain the hands-on, contextualised nature of the workshop.
- Only minor modifications to numeracy content.

**LMS**

**Interactive videos**

**Zoom**

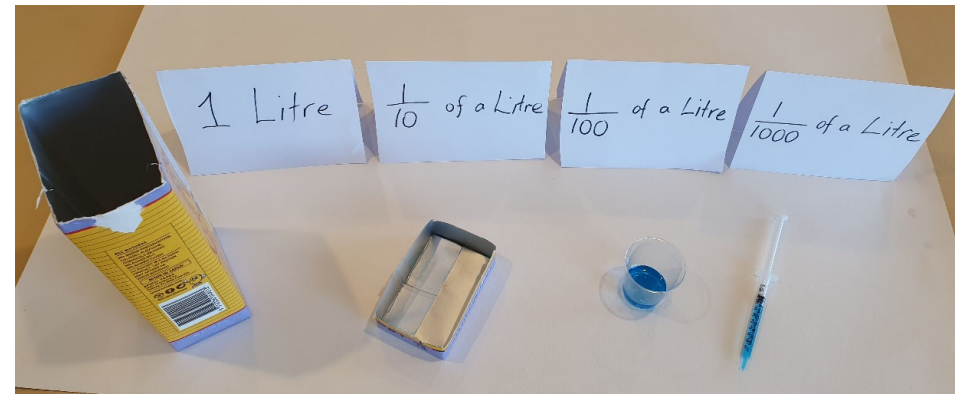
**Planning wiki**

**Numbas**

- Main assets were excellent teamwork and varied team skills.
- Limitations were time and budget ... this influenced decisions.

# Nursing numeracy workshop: Online 2020 Production

- Production was coordinated using a team wiki and daily zoom meetings.
- Six new interactive videos (Adobe Captivate).
- Nine new Numbas quizzes.
- Blackboard LMS site completely rebuilt.
- Project completed in 6 weeks.



# Nursing numeracy workshop: Online 2020 Delivery

- Five-day fully online workshop (still in mid-year break).
- Work laid out for each day on LMS (asynchronous and synchronous).
- Interactive videos, curated online resources, live concluding lecture.
- Numbas quizzes – Check your understanding and Homework.
- 10am and 2pm Zoom sessions daily.

# Online program

<u>Before you begin</u>	<p>Before you begin the workshop, we ask that you complete a pre test and survey. The pre test will help you to assess your own level of numeracy prior to commencing the workshop and the survey gives MESH staff an idea of your background and self assessment of your abilities.</p> <p>Welcome (video)</p> <p>Pre test</p> <p>Pre survey</p> <p>Nursing Numeracy Self Study Group</p> <p>List of Equipment</p>
<u>Day 1</u>	<p>[1] LIVE SESSION 10AM: Welcome</p> <p>[2] LIVE SESSION 10.30AM: Number and measurement in the nursing context</p> <p>[3] LESSON: Fractions of a litre (interactive video)</p> <p>[4] LIVE SESSION 2PM: Day 1 recap</p> <p>[5] HOMEWORK for Day 1</p>
<u>Day 2</u>	<p>[1] LIVE SESSION 10AM: Follow-up on Day 1</p> <p>[2] LESSON: Place value and decimals (interactive video)</p> <p>[3] CHECK YOUR UNDERSTANDING: Place value and decimals quiz</p> <p>[4] LESSON: Rounding decimal numbers (interactive video)</p> <p>[5] CHECK YOUR UNDERSTANDING: Rounding decimal numbers quiz</p> <p>[6] LIVE SESSION 2PM: Day 2 recap</p> <p>[7] HOMEWORK for Day 2</p>

<u>Day 3</u>	<p>[1] LIVE SESSION 10AM: Follow-up on Day 2 (including homework review)</p> <p>[2] LESSON: Metric system of measurement (interactive video)</p> <p>[3] CHECK YOUR UNDERSTANDING: Metric system of measurement quiz</p> <p>[4] LESSON: Percentile charts (interactive video)</p> <p>[5] LIVE SESSION 2PM: Day 3 recap</p> <p>[6] HOMEWORK for Day 3</p>
<u>Day 4</u>	<p>[1] LIVE SESSION 10AM: Follow-up on Day 3 (including homework review)</p> <p>[2] LESSON: Working with scales (interactive video)</p> <p>[3] CHECK YOUR UNDERSTANDING: Working with scales quiz</p> <p>[4] LESSON: Best syringe for the job (interactive video)</p> <p>[5] CHECK YOUR UNDERSTANDING: Best syringe for the job quiz</p> <p>[6] LIVE SESSION 2PM: Day 4 recap</p> <p>[7] HOMEWORK for Day 4</p>
<u>Day 5</u>	<p>[1] LIVE SESSION 10AM: Follow-up on Day 4 (including homework review)</p> <p>[2] LESSON: Weight per Volume (interactive video)</p> <p>[3] CHECK YOUR UNDERSTANDING: Weight per volume quiz</p> <p>[4] LIVE SESSION 1PM: medication calculation lecture and wrap up of workshop</p> <p>Post survey</p> <p>Post test</p>



### [1] LIVE SESSION 10AM: Follow-up on Day 1 (including homework review) A+

Please be on time for this Zoom session and note that you must be logged in to Zoom using your Western Sydney University account to be able to join: <https://uws.zoom.us/j/98616122282?pwd=VUh6WkcrbWQzQnJGVFZjOTN6RFpHdz09>  
You might need the password, 796512, or use the link for Day 1.



### [2] LESSON: Place value and decimals (interactive video) A+



### [3] CHECK YOUR UNDERSTANDING: Place value and decimals quiz

Attempt this quiz after you have completed the Place value and decimals interactive video. This quiz will help to consolidate the concepts covered in the video.  
If you find a particular question challenging, please post it to the Discussion board in vUWS, and we can discuss it in this afternoon's zoom session.  
Your mark from the quiz will not be recorded. The quiz is designed to help you assess your own learning.



### [4] LESSON: Rounding decimal numbers (interactive video) A+



### [5] CHECK YOUR UNDERSTANDING: Rounding decimal numbers quiz

Attempt this quiz after you have completed the Rounding decimal numbers interactive video. This quiz will help to consolidate the concepts covered in the video.  
If you find a particular question challenging, please post it to the Discussion board in vUWS, and we can discuss it in this afternoon's zoom session.  
Your mark from the quiz will not be recorded. The quiz is designed to help you assess your own learning.



### [6] LIVE SESSION 2PM: Day 2 recap A+

Please be on time for this Zoom session and note that you must be logged in to Zoom using your Western Sydney University account to be able to join: <https://uws.zoom.us/j/98616122282?pwd=VUh6WkcrbWQzQnJGVFZjOTN6RFpHdz09>



### [7] HOMEWORK for Day 2

This is your homework for Day 2. This homework quiz should help consolidate the concepts covered in today's workshop.  
If you find a particular question challenging, please post it to the Discussion board in vUWS, and we can discuss it in tomorrow morning's zoom session.  
Your mark from the quiz will not be recorded. The quiz is designed to help you assess your own learning.

# Daily schedule (Day 2)



# Numbas question sample

Mr Chung is in hospital. He is recovering from abdominal surgery, and is being fed via a tube. His feeding plan is shown below.

He needs to have 2.7 litres of fluid in total every 24 hours.

ENTERAL FEEDING PLAN								
Name		Patient		Registration Number		654321		
METHOD		SITE		PERIOD				
	FLUID TYPE	Amount (mL)	Duration (hrs / min)	From		To		Rate mL / hr
				Date	Time	Date	Time	
1	Milk formula	400		22/06/2020	7.00am			
2	Drink	200		22/06/2020	10.00 am			
3	Porridge	400		22/06/2020	12.00 noon			
4	Milk formula	250		22/06/2020	4.00 pm			
5	Blended food	400		22/06/2020	6.00 pm			
6	Milk formula	250		22/06/2020	8.00 pm			
7	Porridge	400		22/06/2020	10.00 pm			
8	Fruit juice	?		22/06/2020	12.00mn	23/06/2020	7.00 am	
TOTAL			24 hrs					

What volume of fruit juice should be given to Mr Chung in order to achieve his daily total? Give your answer in millilitres. Do not enter the measurement units.

# Nursing numeracy workshop: Online 2020

## Lessons learned: Pedagogical

- Benefits
  - Available to wider audience over a longer period.
- Challenges
  - Learning activated by practical activities probably lost.
  - Requires students to self-regulate their learning - assumptions about adult learners?
  - Loss of visual cues for detecting student difficulties.
- Lessons learned
  - External motivation needed.
  - Practical activities not as effective with videos.

# Nursing numeracy workshop: Online 2020

## Lessons learned: Curricular

- Benefits
  - No longer relying on tutors to remember everything.
- Challenges
  - Control the linear sequence of learning.
  - Student engagement with practical activities uncertain.
- Lessons learned
  - Small content chunks were missing.

# Nursing numeracy workshop: Online 2020

## Lessons learned: Student engagement

- Benefits
  - Numbas quizzes offer a window into students' participation and learning.
- Challenges
  - How to measure student attendance, engagement, completion of pracs?
  - Zoom attendance and pre-test/post-test completion.
- Lessons learned
  - Much higher student motivation is required.

# Attendance

2019 Face-to-face

No. of days attended	No. students	
Only 1 day	8	8%
2 days	42	42%
All 3 days	50	50%
<b>total</b>	100	

2020 Online

No. of days attended	No. students	
Only 1 day	33	40%
2 days	15	18%
3 days	9	11%
4 days	9	11%
All 5 days	16	19.5%
<b>Total</b>	82	

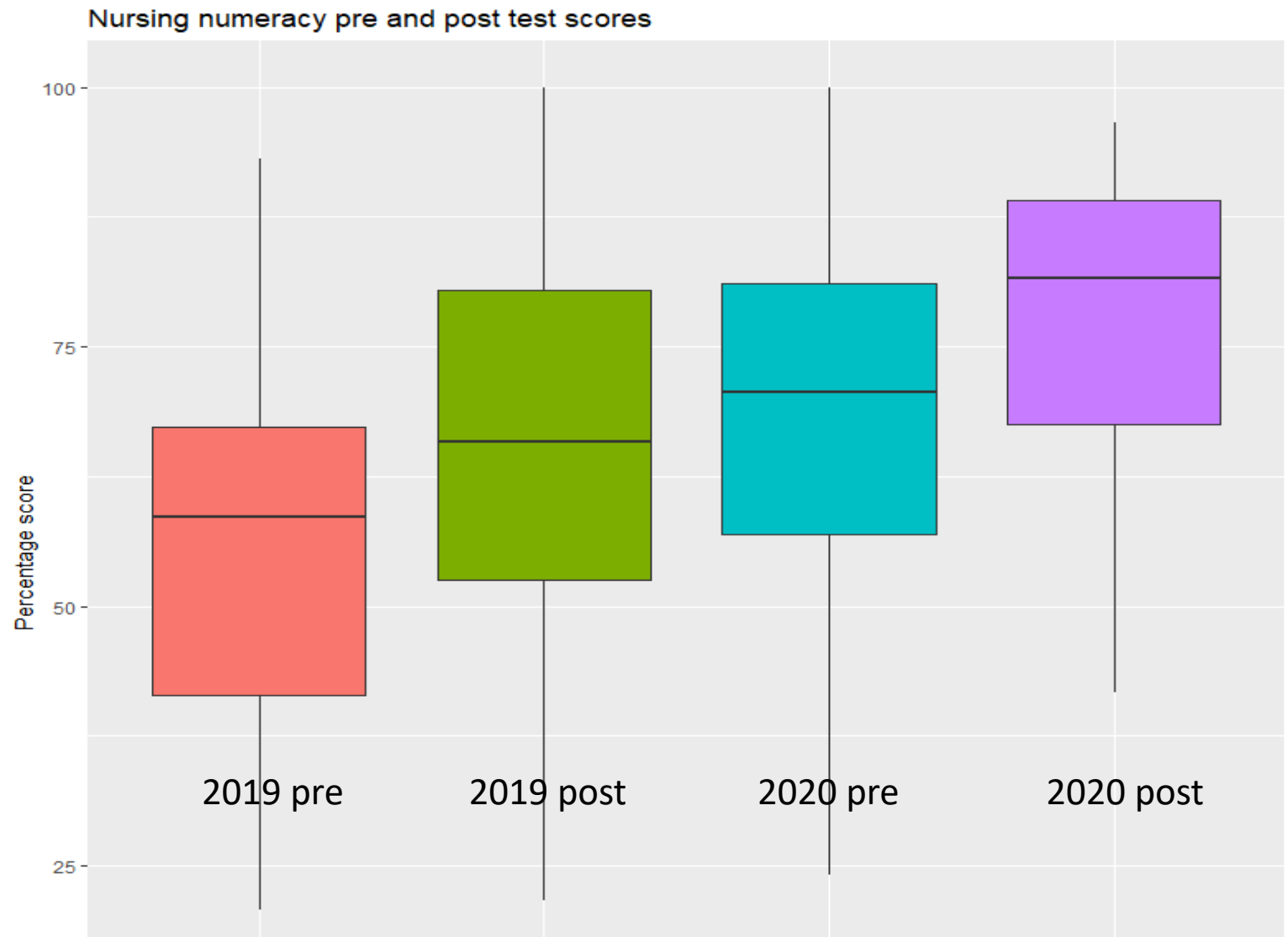
# Nursing numeracy workshop: Online 2020

## Lessons learned: Technical

- Benefits
  - Exploiting features of Zoom and Numbas.
- Challenges
  - Students with technical difficulties.
  - To create or curate resources?
- Lessons learnt
  - Upskill students at the start.

# Student learning

as measured  
by  
pre-test  
vs  
post-test  
results



# Evaluation of online workshop

- Positives
  - We did it!
  - Ongoing repository of support available for students.
  - Additional new workshop requests from School of Nursing and Midwifery.
  - Using NUMBAS for assessment *for* learning as well as of assessment *of* learning.
  - Numbas established as a central part of MESH workshops across the university.
- Room for improvement
  - Some further (small) gaps in content identified.
  - Ensuring essence of face-to-face workshop is retained (especially prac activities).
  - Student engagement with tutors.