Kingston University London

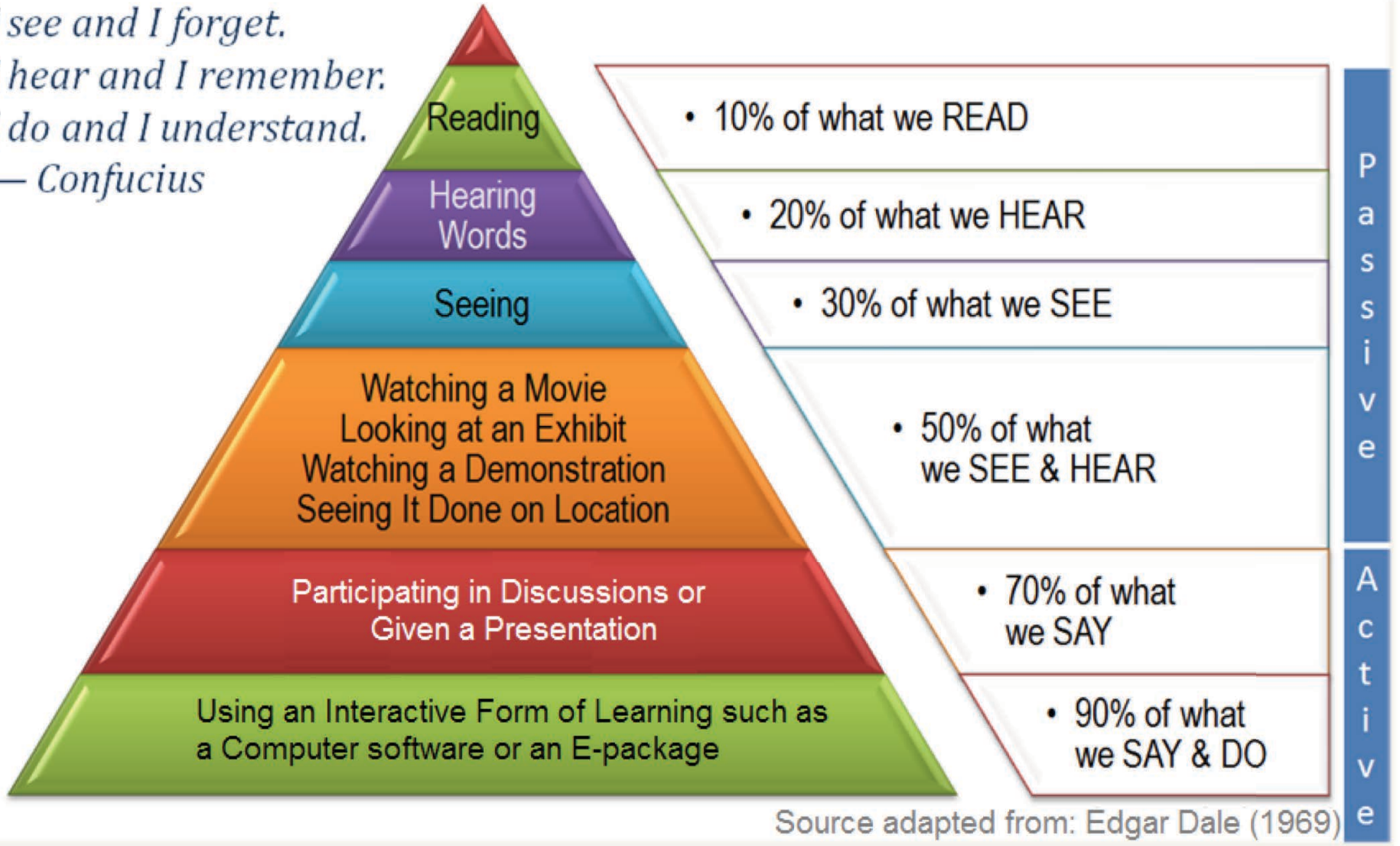
# Feasibility and Impact of E learning for Calculation

Dr. Reem Kayyali

# Background

- Both MPharm graduates and pre-registrants should be able to demonstrate the use of pharmaceutical calculations to verify the safety of prescribed doses and rates of administration – **Does**

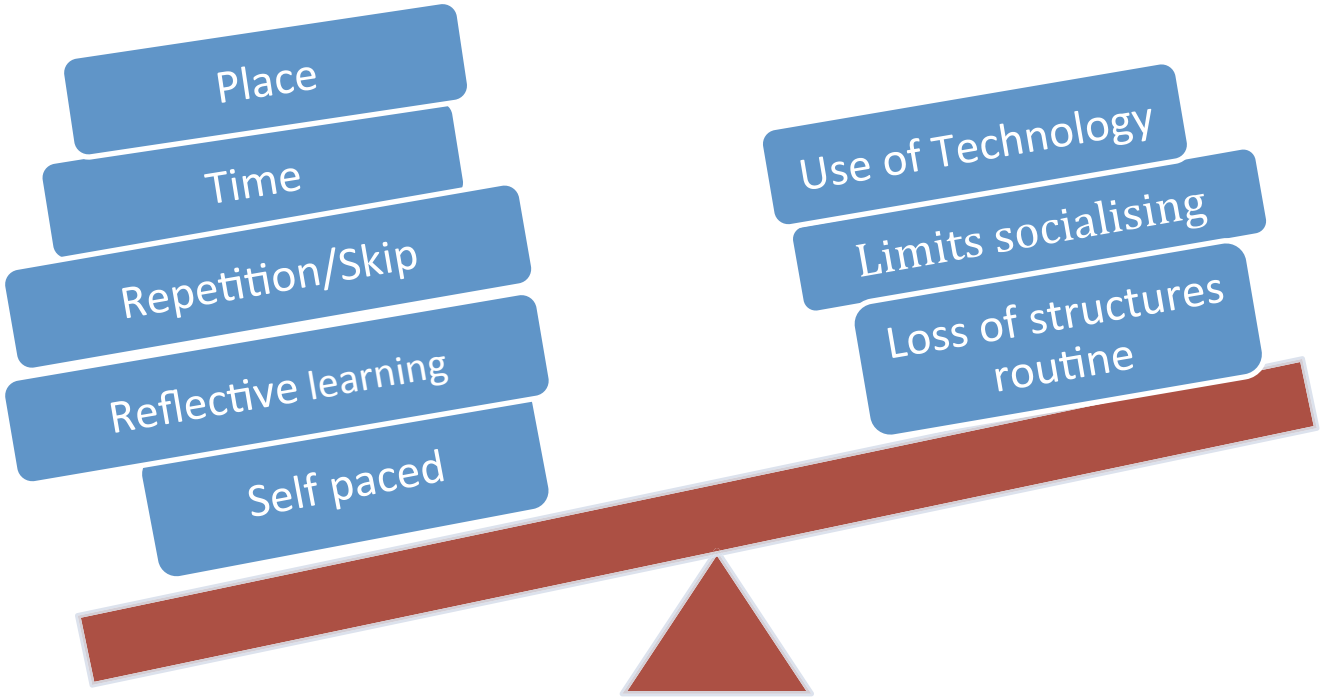
*I see and I forget.*
*I hear and I remember.*
*I do and I understand.*
*— Confucius*




Source adapted from: Edgar Dale (1969)

Advantage

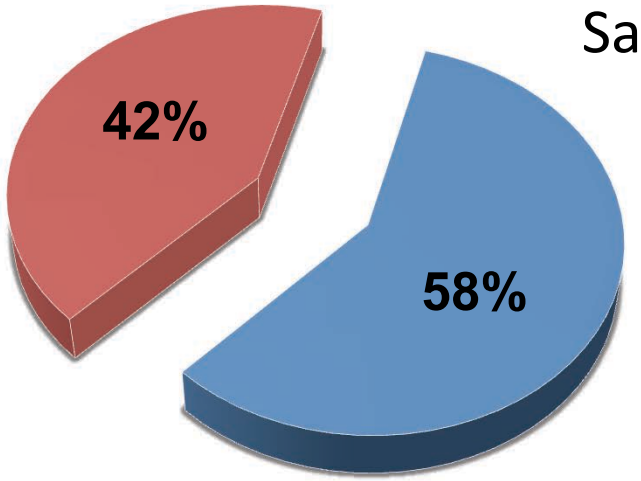
Disadvantage



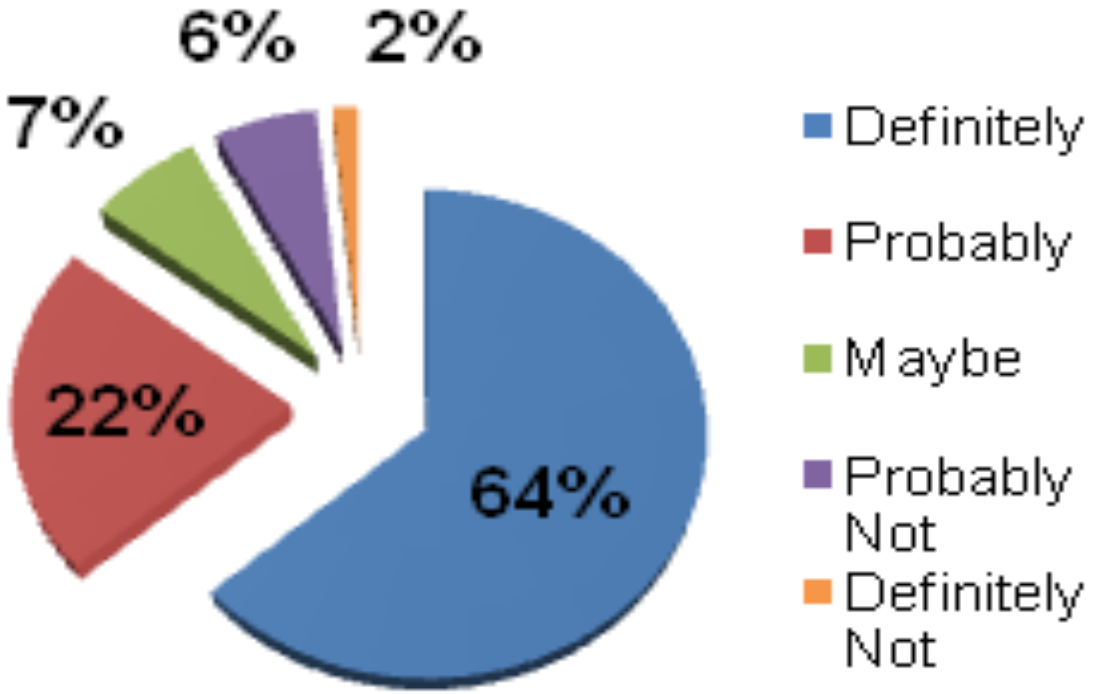
# Strategy

- Assess needs
- Design
- Evaluation
  - Quizzes
  - Questionnaire - perceptions

Satisfaction with calculation training




Interest in E-package



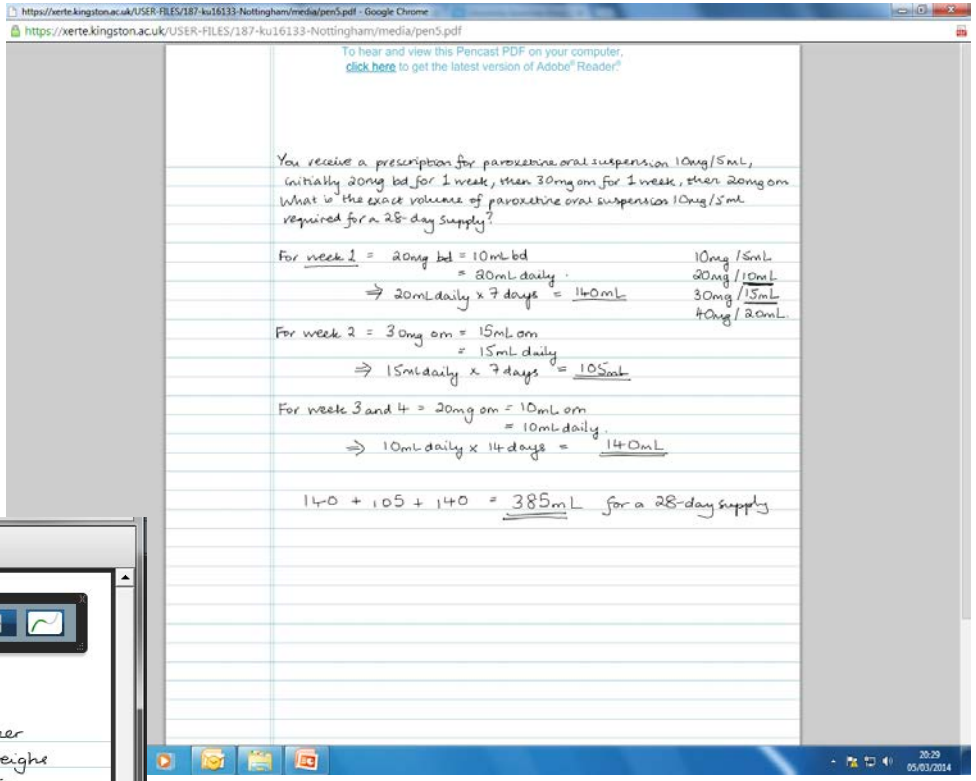

N=134

# Features

- Tutor led
- Feedback
- Provide practice questions


record pause stop
jump


record pause stop
jump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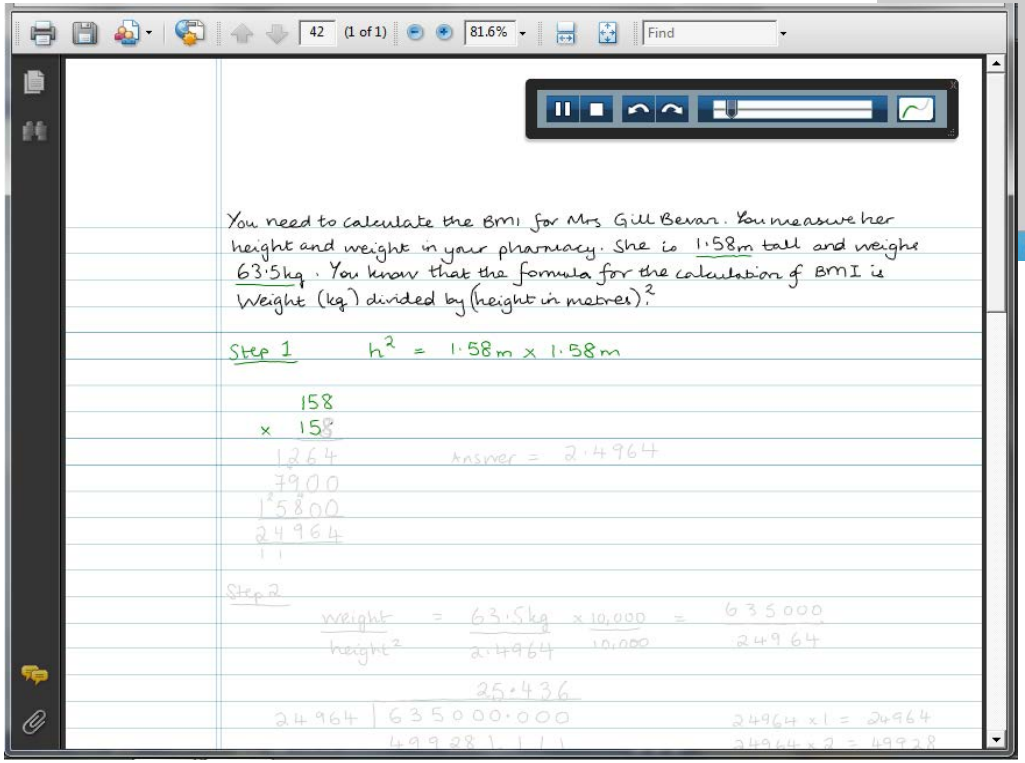
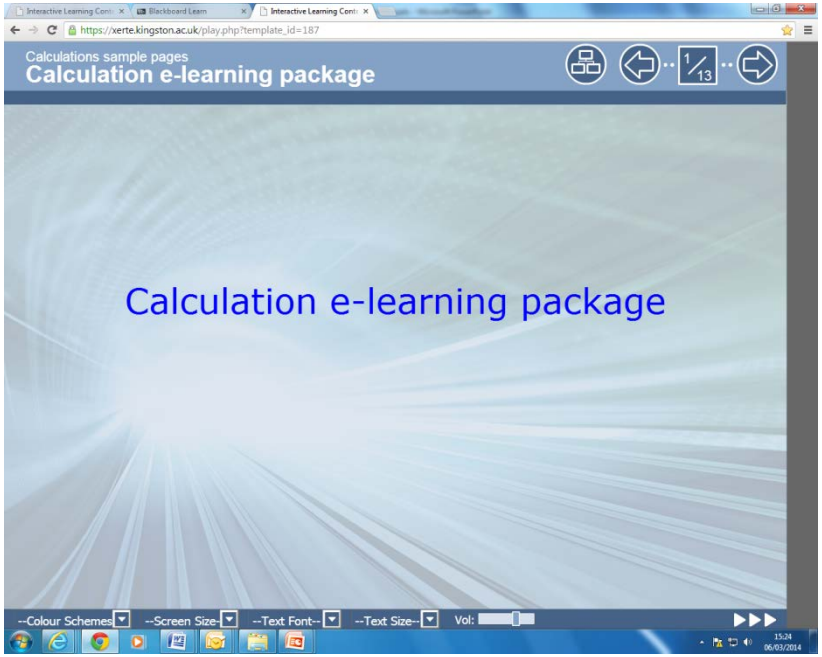
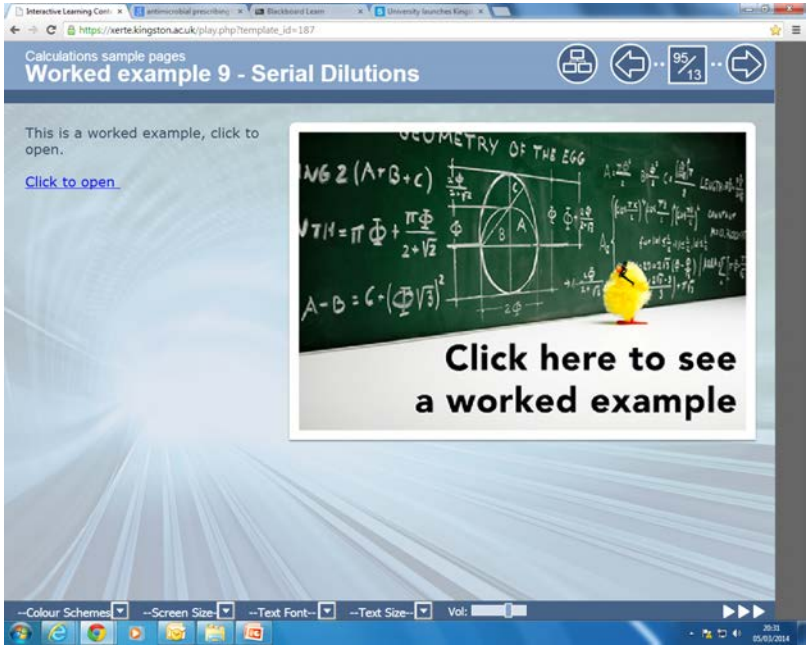
https://xerte.kingston.ac.uk/USER-FILES/187-ku16133-Nottingham/media/pen5.pdf
To hear and view this Pencast PDF on your computer, click here to get the latest version of Adobe® Reader®
You receive a prescription for paroxetine oral suspension 10mg/5mL, initially 20mg bd for 1 week, then 30mg om for 1 week, then 20mg om. What is the exact volume of paroxetine oral suspension 10mg/5mL required for a 28-day supply?
For week 1 = 20mg bd = 10mL bd
= 20mL daily
⇒ 20mL daily x 7 days = 140mL
10mg / 5mL
20mg / 10mL
30mg / 15mL
40mg / 20mL
For week 2 = 30mg om = 15mL om
= 15mL daily
⇒ 15mL daily x 7 days = 105mL
For week 3 and 4 = 20mg om = 10mL om
= 10mL daily
⇒ 10mL daily x 14 days = 140mL
140 + 105 + 140 = 385mL for a 28-day supply
20:29
05/03/2014


42 (1 of 1)
81.6%
Find
You need to calculate the BMI for Mrs Gill Bevan. You measure her height and weight in your pharmacy. She is 1·58m tall and weighs 63·5kg. You know that the formula for the calculation of BMI is Weight (kg) divided by (height in metres)$^2$.
Step 1 $h^2$ = 1·58m x 1·58m
158
x 158
1264
7900
15800
24964
Answer = 2·4964
Step 2
weight / height$^2$ = 63·5kg / 2·4964 x 10,000 / 10,000 = 635000 / 24964
25·436
24964 | 635000·000
24964 x 1 = 24964
24964 x 2 = 49928



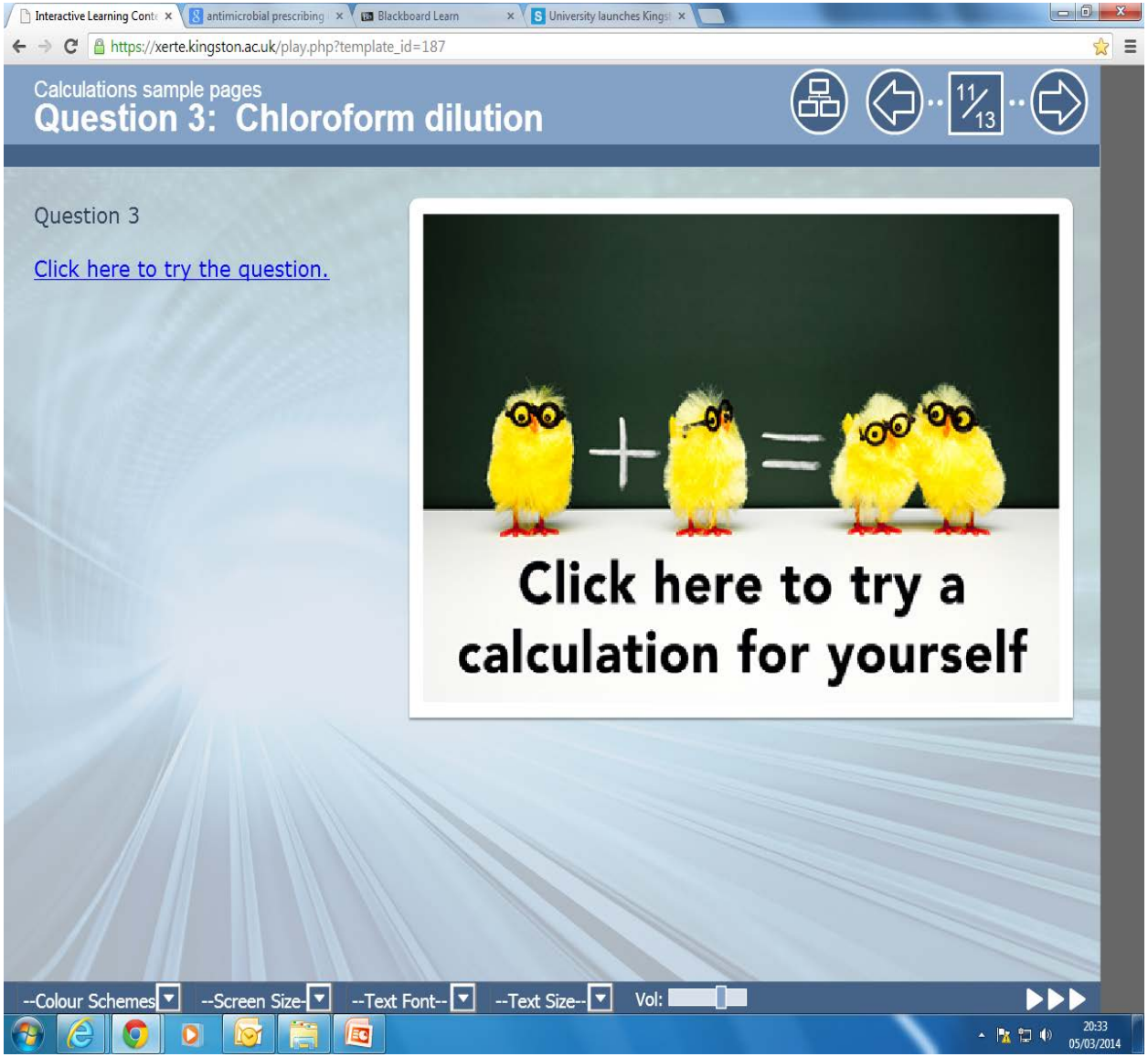

**Basic Pharmaceutical calculations (25)**

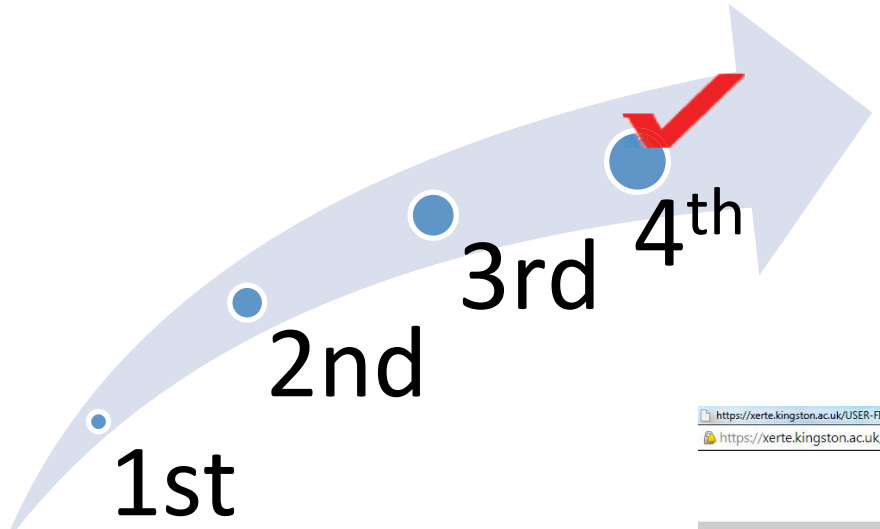
- Units
- Percentages

**Specific pharmaceutical calculations (15)**

- Worked examples
- Practice questions

| Topics |
| --- |
| Body Mass Index |
| Molarity |
| Infusion rates |
| Dose Calculations |
| Extemporaneous Formulation |
| Displacement Volume |
| Equivalent Doses |
| Multiple Dilutions |
| Serial dilutions |
| Chloroform Dilution |
| Half Life |
| Suppositories- Displacement value |
| Renal function-Ideal body weight |
| Allegation |






# Feedback

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https://xerte.kingston.ac.uk/USER-FILES/187-ku16133-Nottingham/media/sec5.swf

**Approximately how many mmoles of sodium ions are present in 250mL of 0.9% w/v sodium chloride solution? (Atomic weights: sodium = 23g/mol, chlorine=35.5g/mol). Provide the final answer to 2 decimal places.**

Type your answer in this box:

mmol

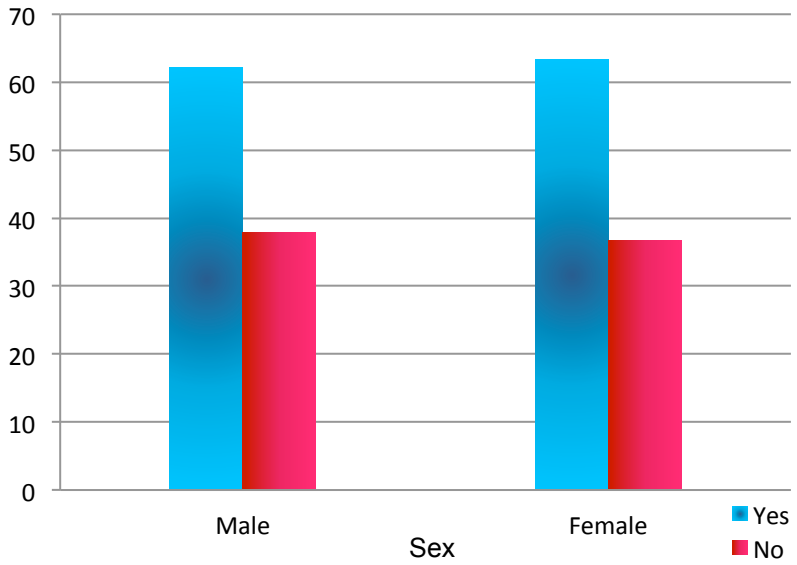
Check

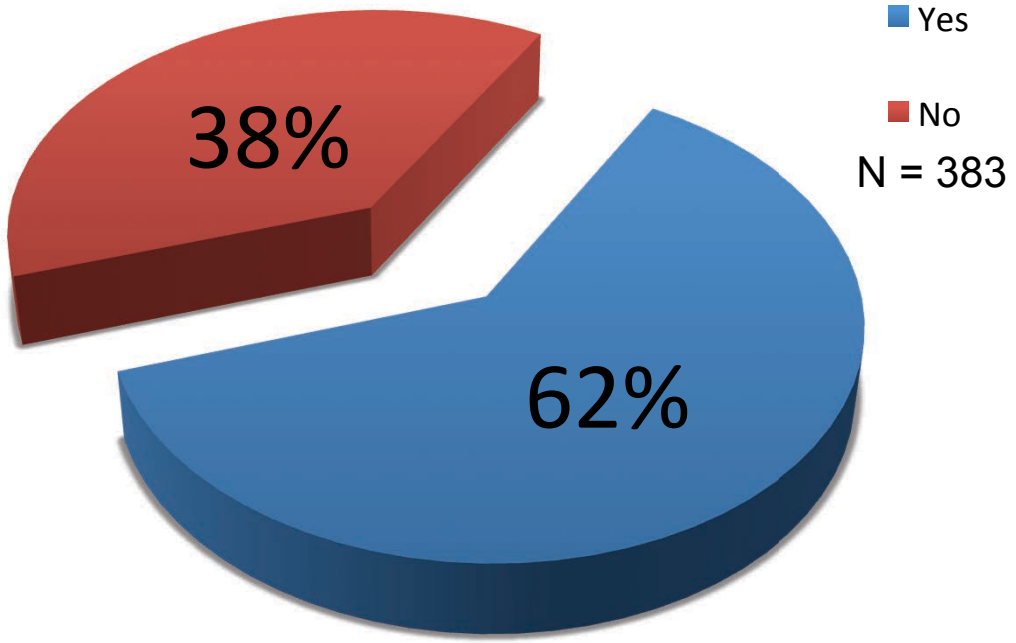
Remember 1 mole of sodium chloride contains 1 mole of sodium and 1 mole of chlorine.

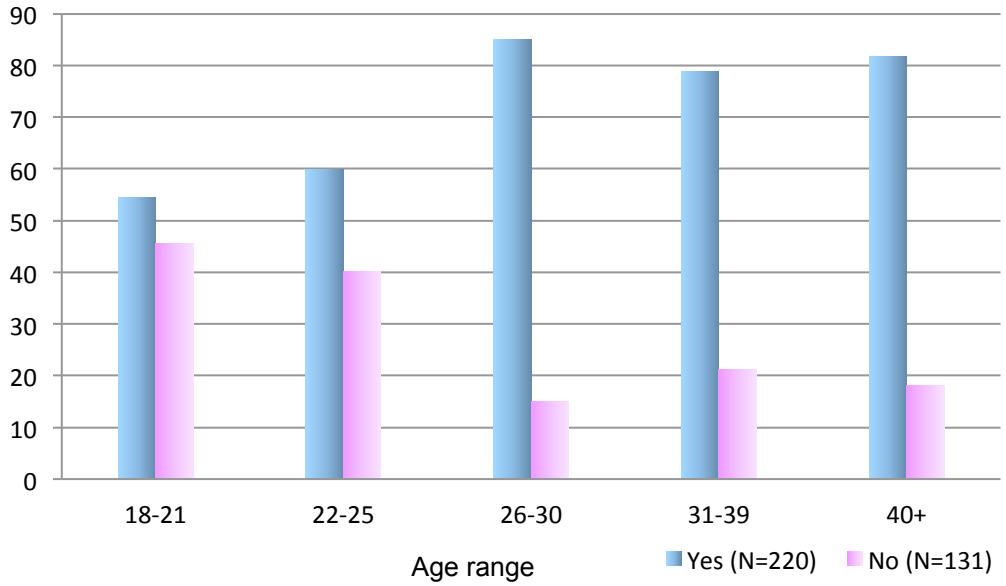
1 mole of sodium chloride = 23 + 35.5 = 58.5g.

So 1mmol of sodium chloride = 58.5mg.

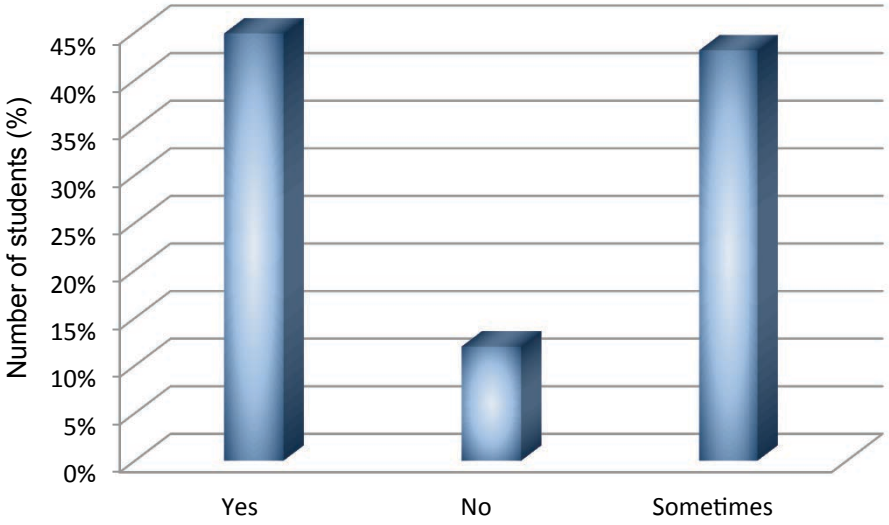
08:31
06/03/2014



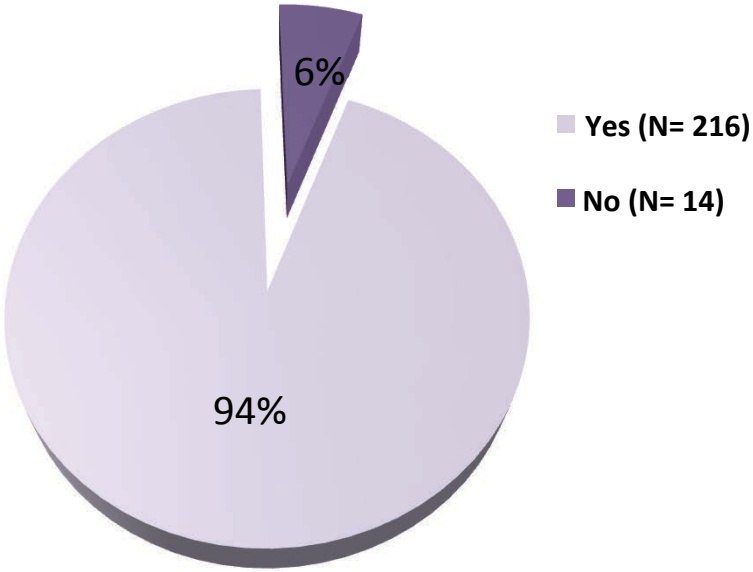



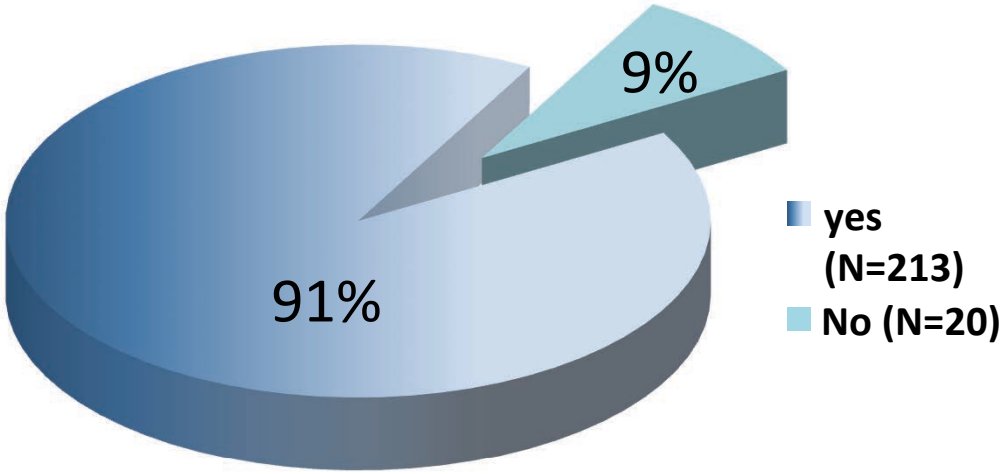

The use of the e-package




Helpfulness of hints N= **225**

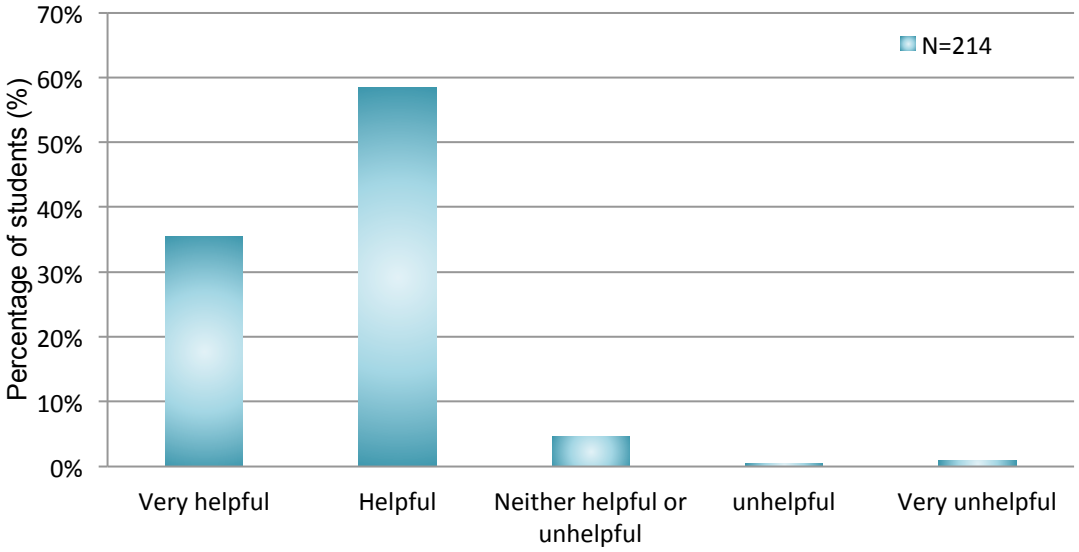



Understanding the instructions and information in the e-package

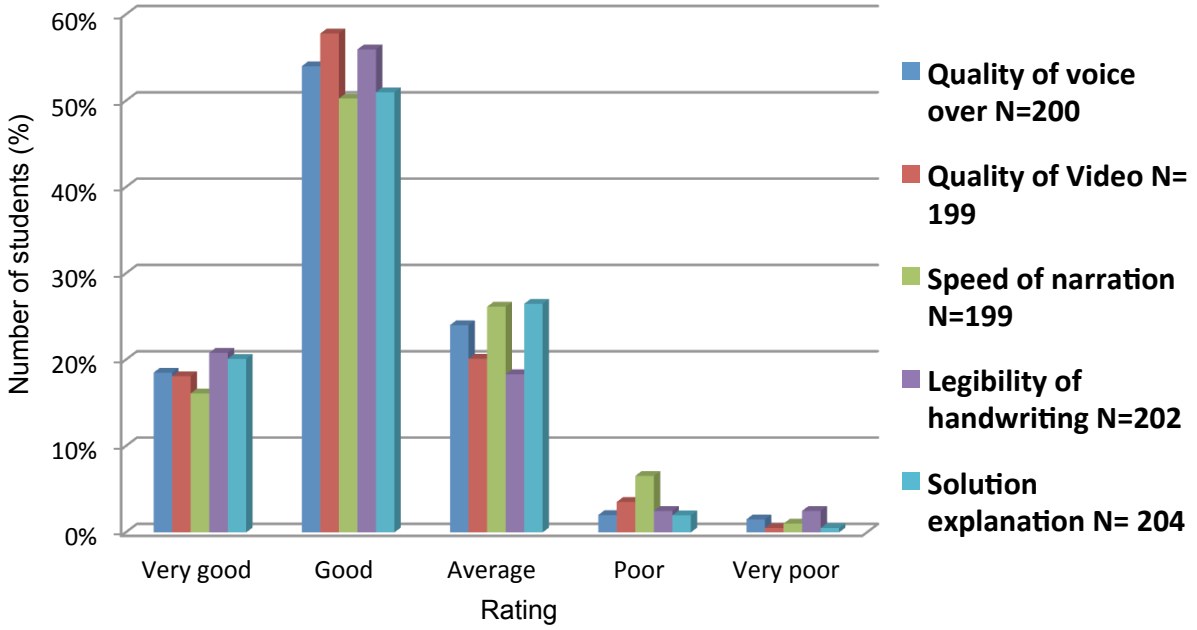



Use of worked examples

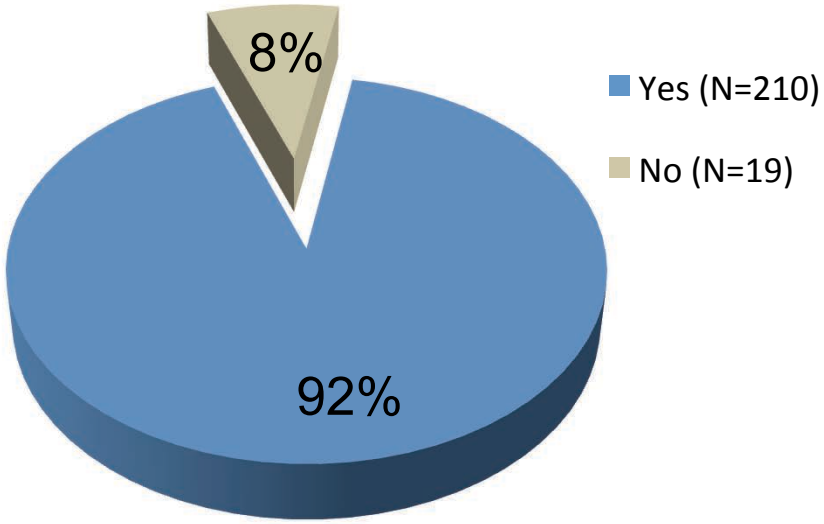
## Usefulness of worked examples



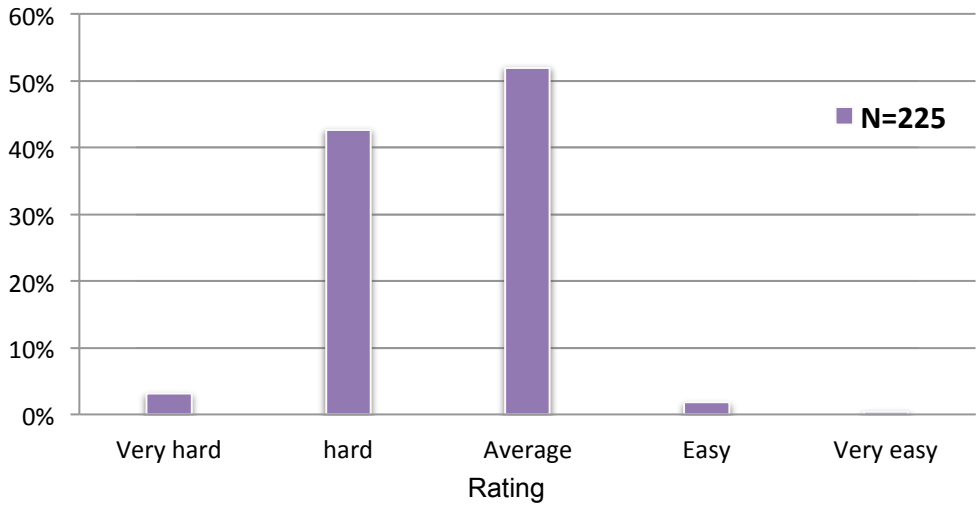

## Quality of the worked examples

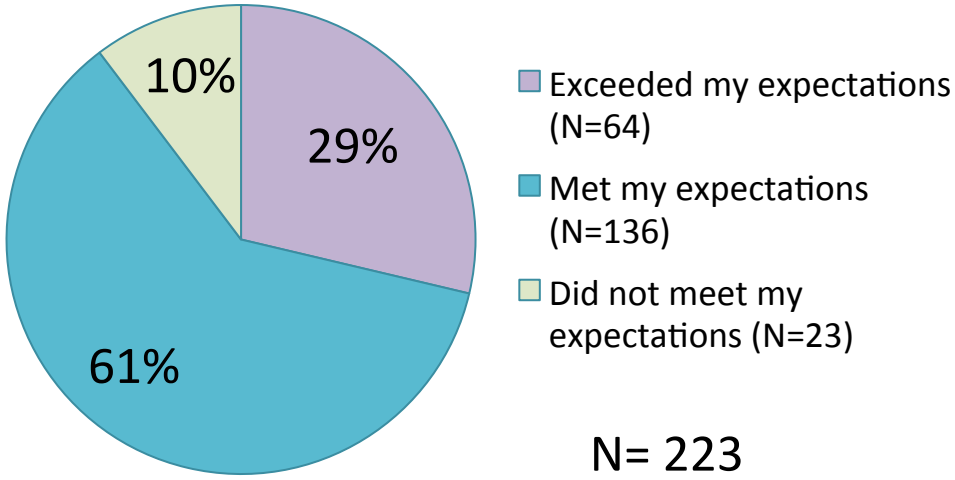


## Relevance of the e-package topics

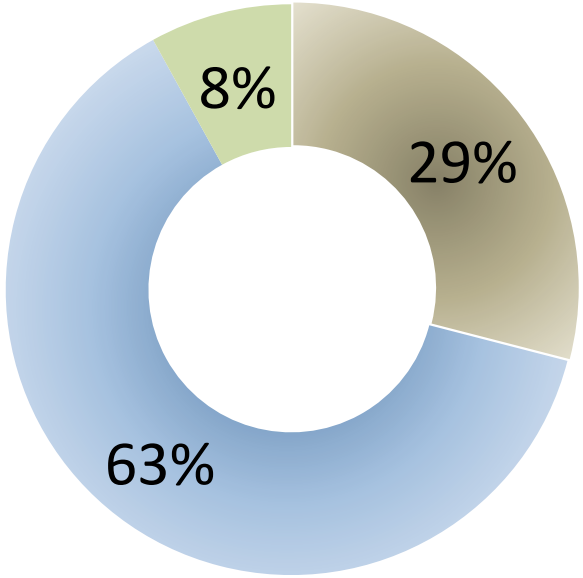



## Difficulty of questions





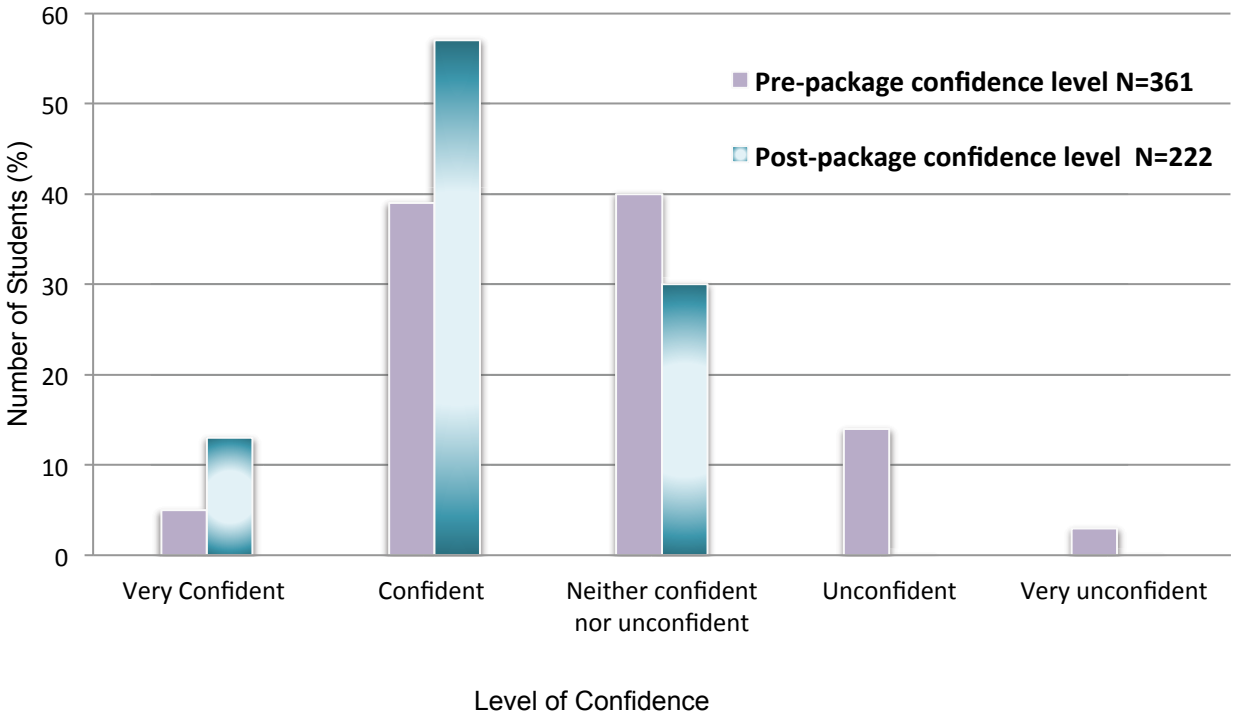

N= 223




N= 225

Very helpful Helpful Neither helpful or unhelpful Unhelpful Very unhelpful

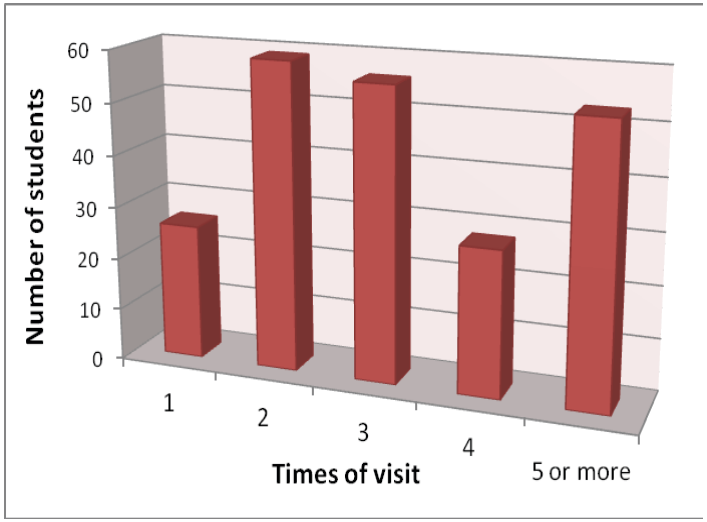
| | |
|---|---|
| 1. Workshops | 77% (N=271) |
| 2.Tutorials | 55% (N=192) |
| 3. E-package | 52% (N=182) |
| 4. Quizzes | 41% (N=143) |
| 5. Online resources | 39% (N=137) |
| 6. Homework | 36% (N=125) |
| 7. Calculation based games/Practicals/ Sample questions | 34% (N=118) |

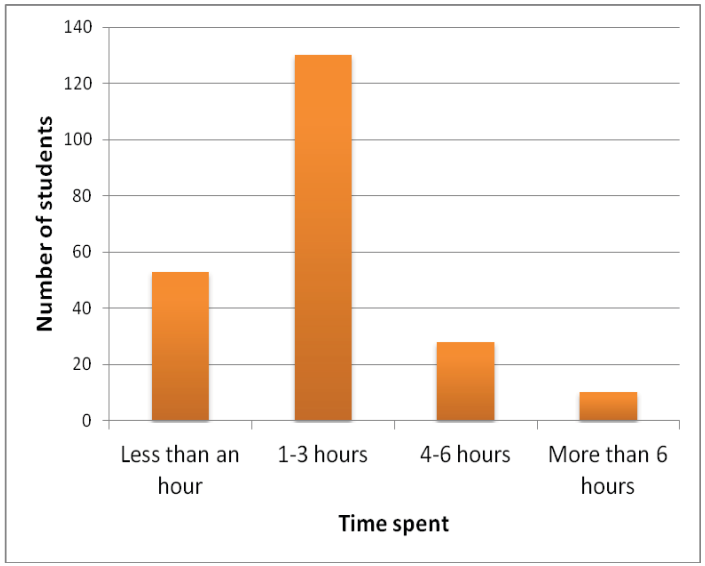


| Student quiz results (%) | Pre-package: Number of students | Post-package: Number of students |
|---|---|---|
| 0-39 | 68% (N=61) | 38% (N=34) |
| 40-69 | 31% (N=28) | 45% (N=40) |
| 70+ | 1% (N=1) | 17% (N=16) |

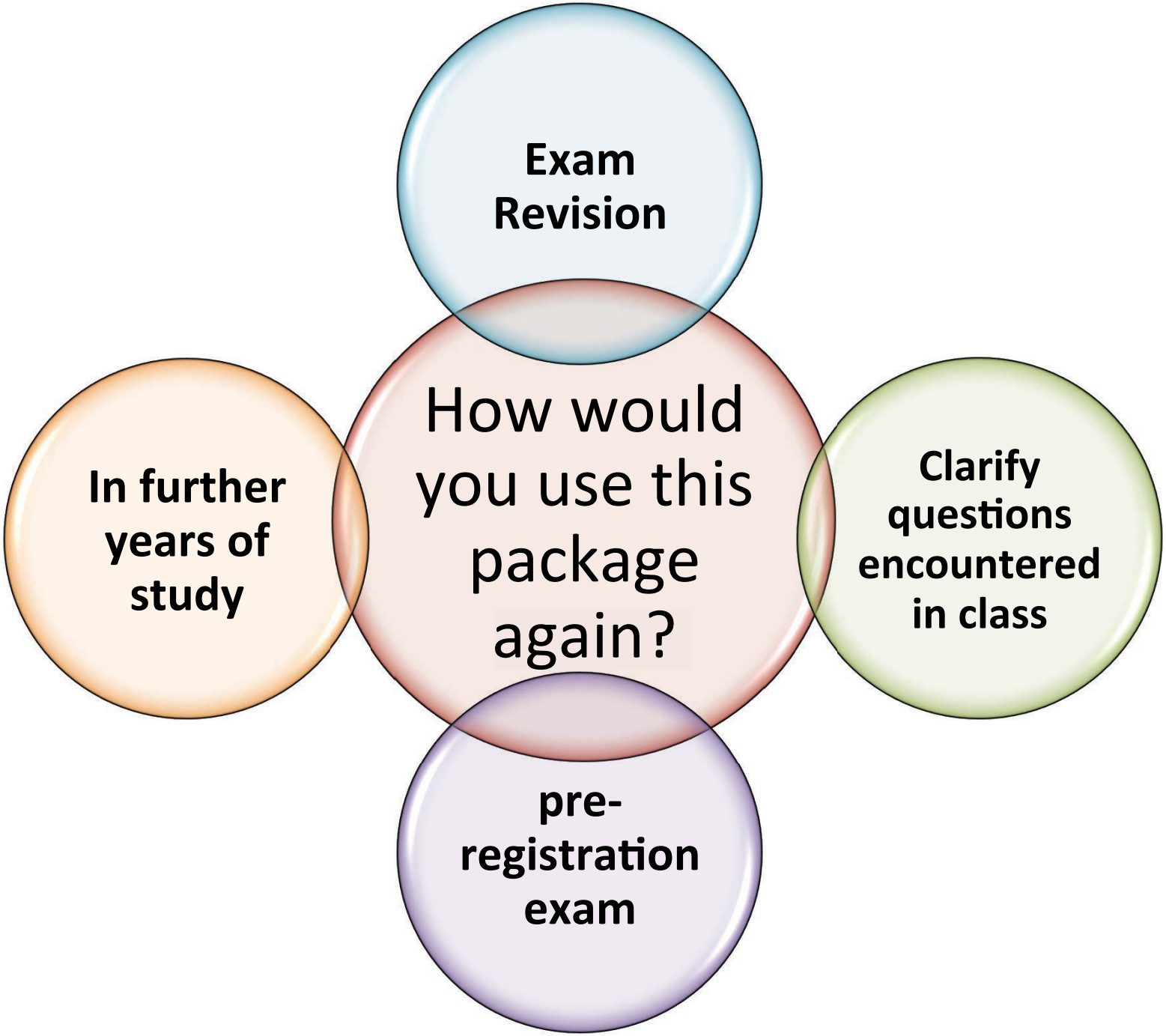
The calculated P value is $2.83 \times 10^{-11}$

| Year 4 MPharm | Quiz 1 | Quiz 2 | Quiz 3 |
|---|---|---|---|
| Mean +/- SD | 2.8 +/-2.1 | 3.0 +/-2.3 | 4.5 +/-2.6 |
| Median | 2 | 2 | 4 |
| Mode | 2 | 2 | 6 |

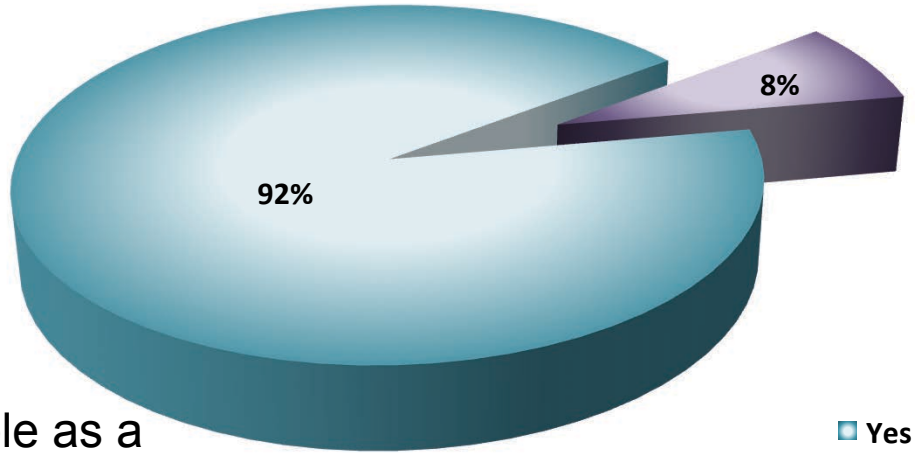



**N=222**

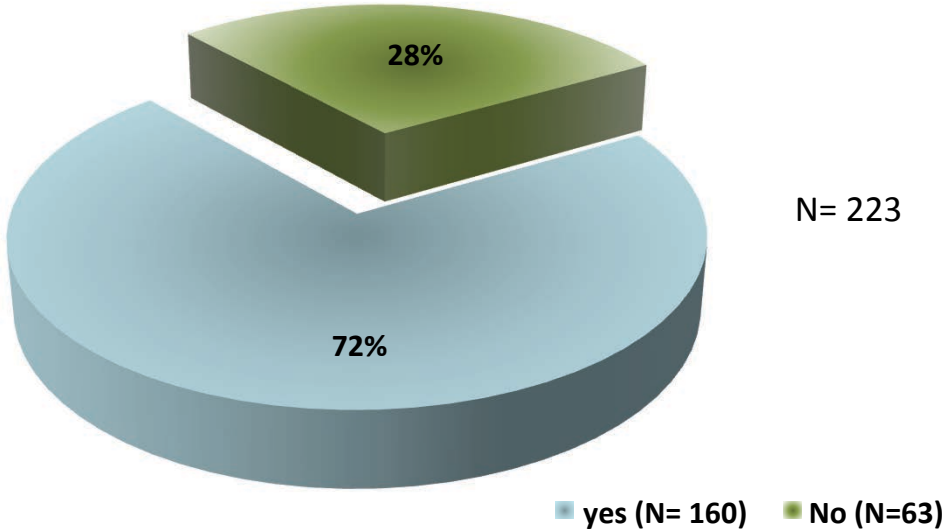

Exam Revision
How would you use this package again?
In further years of study
Clarify questions encountered in class
pre-registration exam

## Interest in similar e-package for other modules




N= 223

## Package preferred to be available as a mobile phone application




N= 223

# Conclusions

- Findings show significant improvement in scores after release of the e-package.
- Students were very positive about the design, ease of use and impact of the e-package on their calculation confidence.
- This package is in routine use by our pharmacy students.
- It has added to the methods students use to practice their calculations – blended learning

# THANK YOU