Assessing student engagement in a multi-media teaching tool in Pharmacy

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School of Pharmacy

Situated in downtown Kitchener, away from rest of UW campus

First cohort started January, 2008 ~ 120 students/year

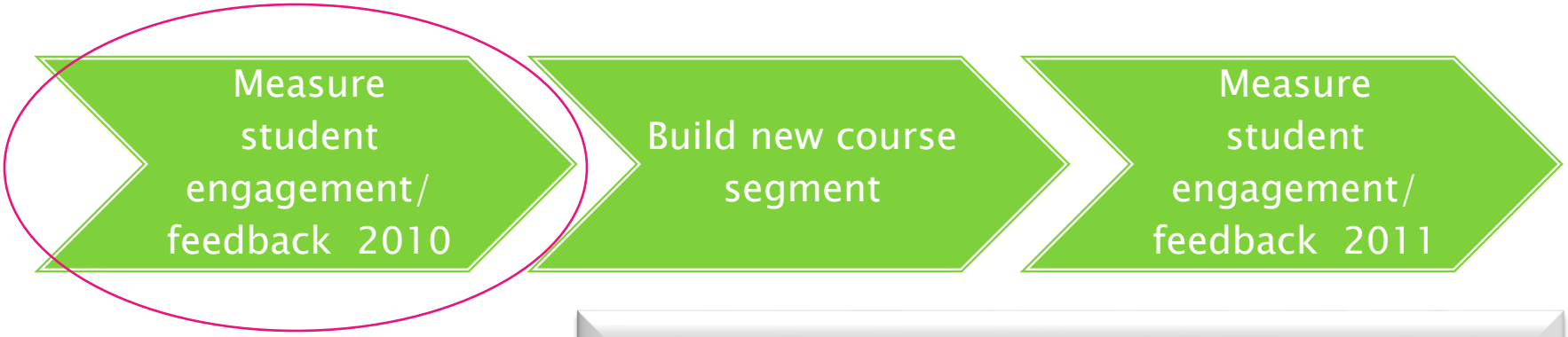
Why Blend?

- Instructor felt comfortable with using technology to build materials
- Instructor liked the idea of the reusability of the online modules
- Instructor felt that having a blended format would save her time as well as allow students to learn difficult material at their own pace
- Had success with blended format in another section of the course

Objectives of our work

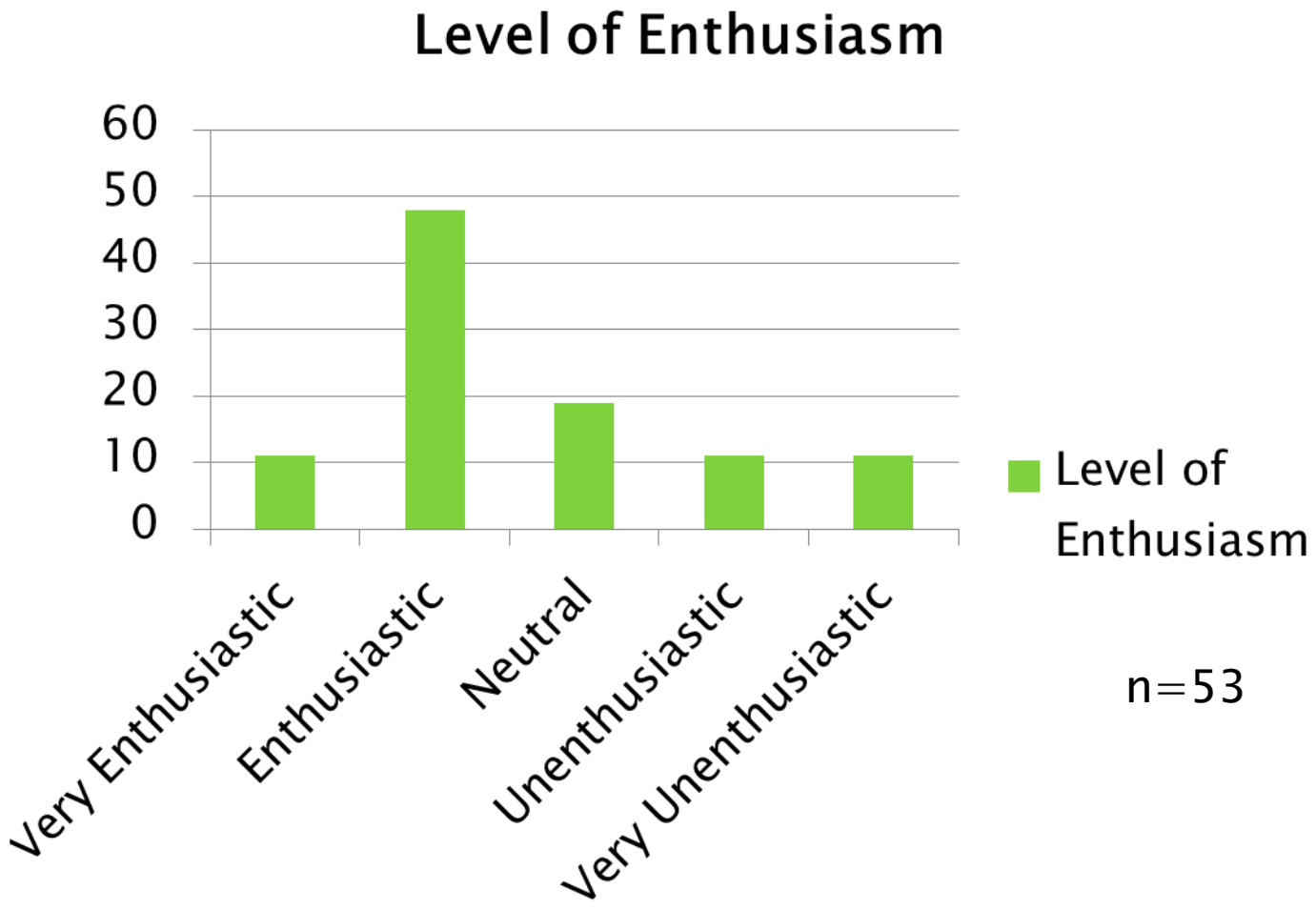
- Create a blended Clinical Biochemistry module based on student feedback
- Assess if the introduction of multi-media based teaching module using virtual field trips, self-assessments and f2f tutorial
  - increases student understanding of the connections between the results from lab measurements and patient assessment
  - enhances student engagement

Based on the premise that blending was a good way to go in Clinical Biochemistry ….

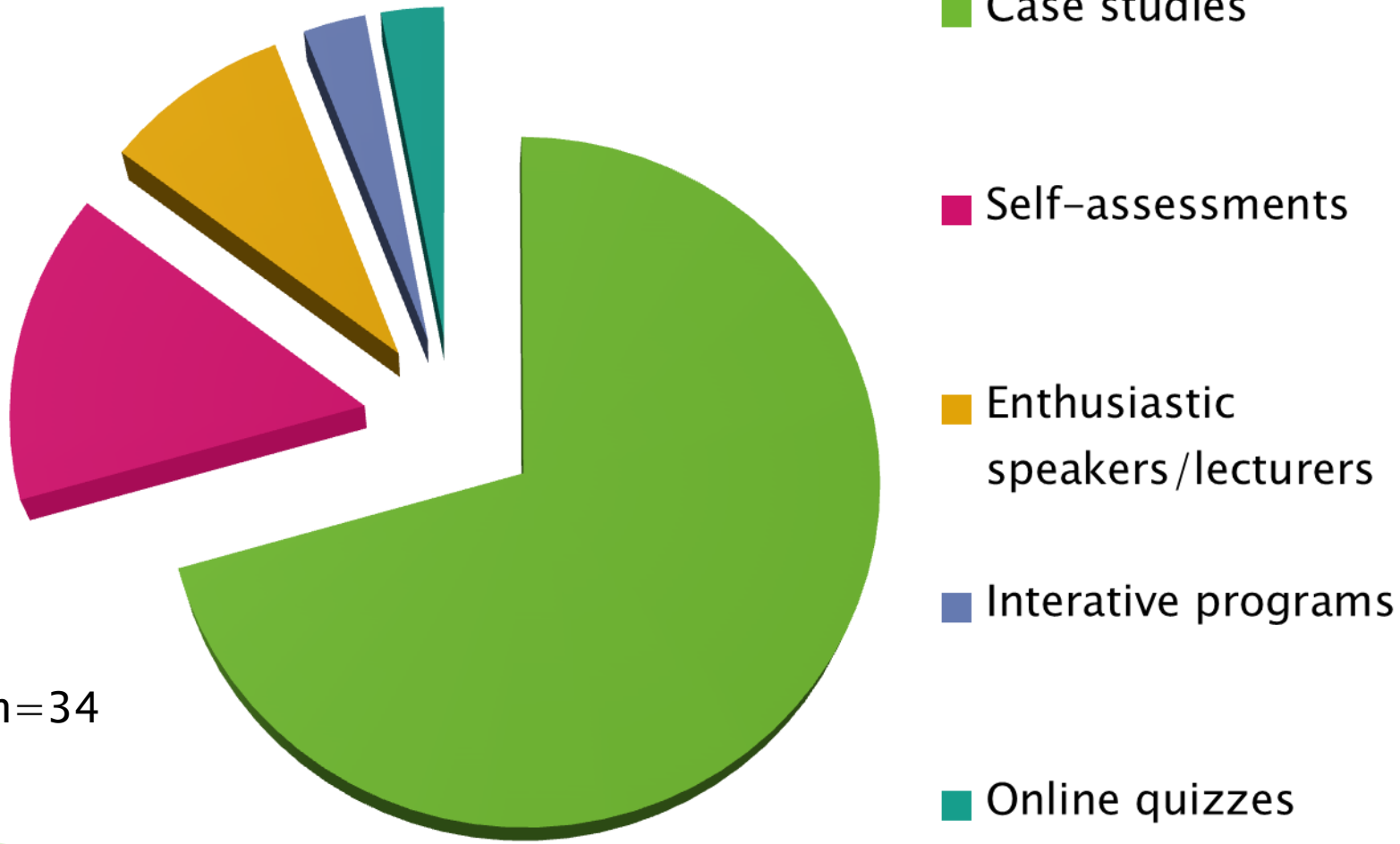


- Feedback from 2010 cohort on what would help them engage and make connections
- Comparison of common exam questions in 2010 and 2011 to examine connections between the results from lab measurements and patient assessment; engagement questions; self-reported gains on learning objectives.

What is your LEVEL OF ENTHUSIASM for introducing a blended format to the Clinical Biochemistry section of the course?



Student Feedback – What *online* course activities would help you connect lab results with patient assessment ?



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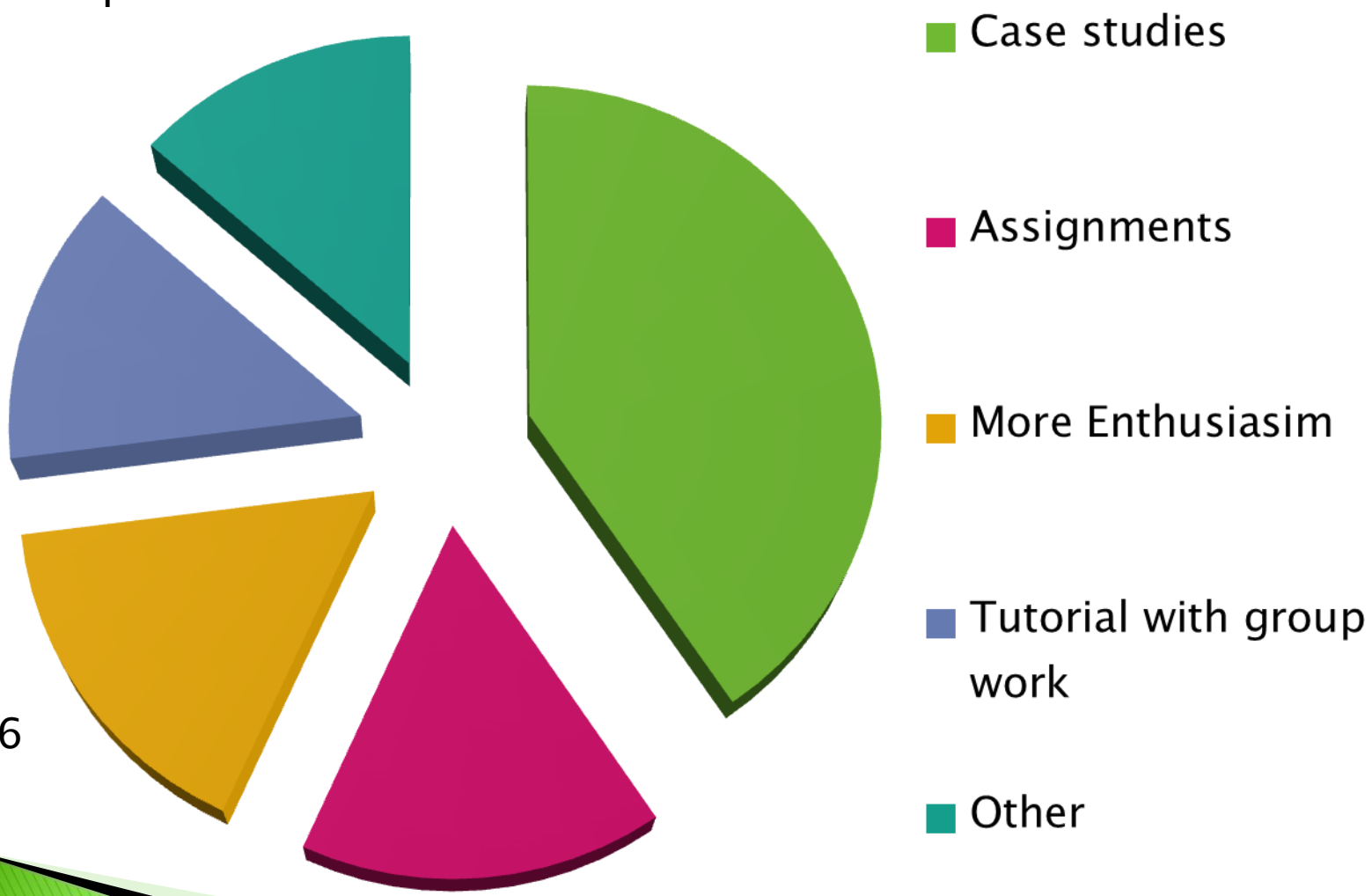
Student Feedback – What *collaborative* course activities would increase your understanding of Clinical Biochemistry course concepts?



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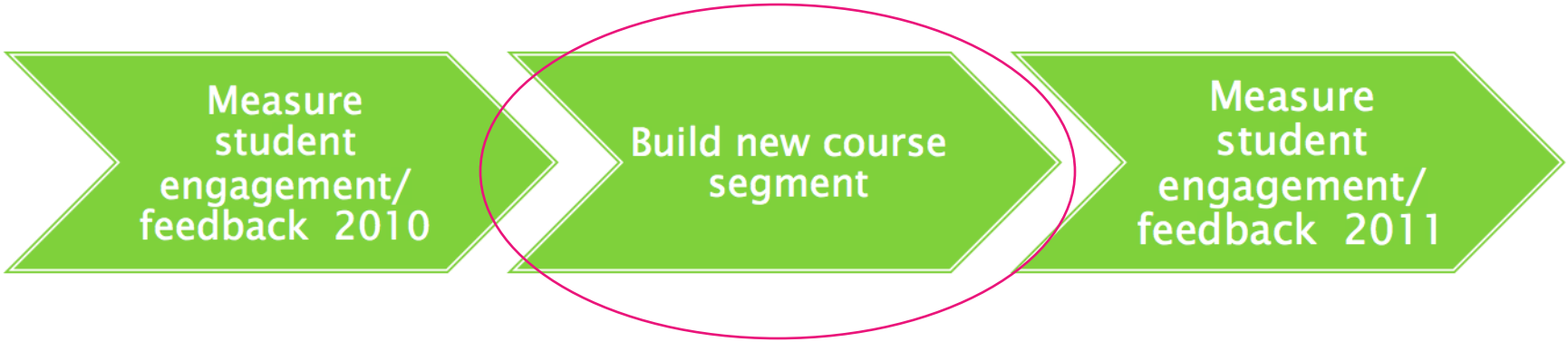
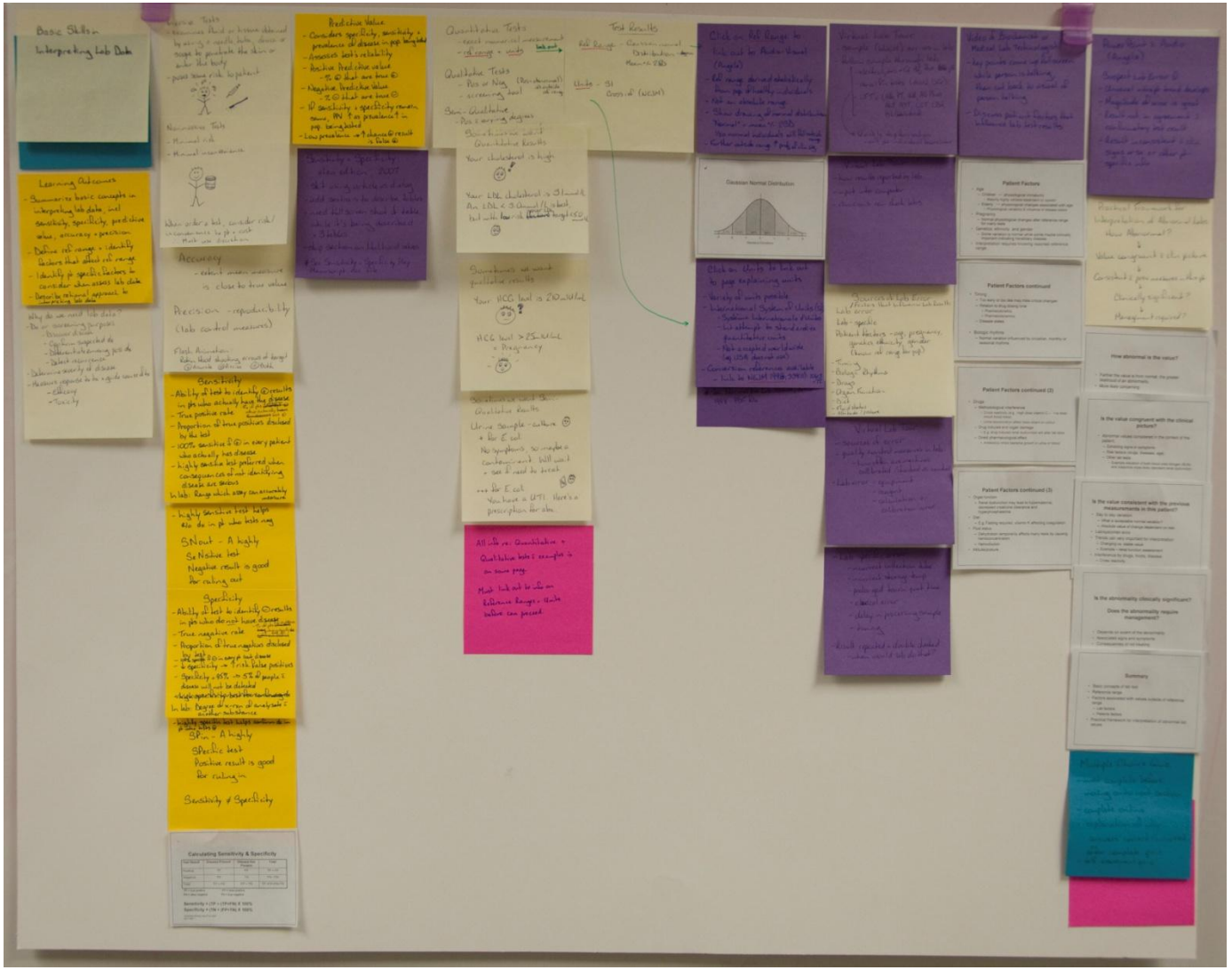


- Built around a virtual field trip to clinical biochemistry lab
  - incorporating one major case and several smaller cases
  - self assessment pieces

Development of the storyboard……..



Development of the outline of the main case study and field trip ....

1. Electrolyte Tests
    1. *Learning Outcomes & Why check electrolytes? (read)*
    2. *Case Introduction – Billy (read)*
    3. *Volume assessment*
        1. Link out to Skin Tenting Photo (we can reproduce this with acknowledgement)
        2. Link out to JVP and Hepatojugular reflux (video) (Andrea to get permission)
        3. Link out to edema picture (Andrea to get permission)
    4. *Fluid status assessment (read)*
    5. *Virtual Lab Tour re: how electrolytes are tested in the lab (video) (Andrea)*
    6. *Billy's lab result table with numerous link outs*
        1. Sodium – narrated PowerPoint (Angela)
        2. Potassium – narrated PowerPoint (Angela)
        3. Chloride – read only
        4. C02/HC03 – Serum bicarbonate read followed by link out to Acid-base status which is read, followed by Billy's results
        1. Self-assessment question on Billy's values
        2. Magnesium, Calcium and Phosphate – narrated PowerPoint (Angela)
    7. *Framework to interpret lab values (read)*
        1. link out to the narrated PowerPoint on this from the Basic skills module
    8. *Self-assessment questions – must complete before moving on*

Module demo…

In face-to-face tutorial ..

SouthCentral Medical

- Two cases presented and students could prepare for either. Working first with the group and then the instructor to analyze each of the cases.

Patient ID:	Encounter:		Date:
#58417	EMERGENCY ROOM		JAN 5

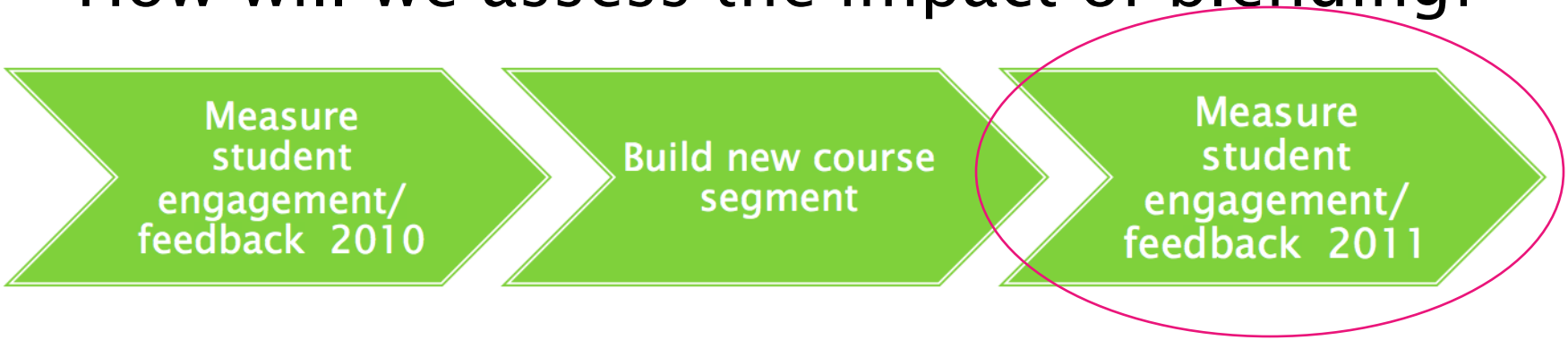
Patient Name:	Age:	Sex:	Admitting Diagnosis:
PETER PRINCE	44 Y	M	EDEMA, FATIGUE

RESULTS LIST

Result Name:	Results:	Units:	Reference Range:
Sodium (Na)	135	mmol/L	135-145
Potassium (K)	3.4	mmol/L	3.5-5
Chloride (Cl)	98	mmol/L	100-108
Bicarbonate (HCO_3)	22	mmol/L	24-30 (CO_2)
BUN	16.2	mmol/L	2.5-8
SCr	253	µmol/L	58-110
Calcium (Ca)	1.91	mmol/L	2.1-2.6
Albumin	29	g/L	35-50

- Opportunity for face to face questions and discussion of material from the on-line modules.

How will we assess the impact of blending?



- Common questions on exam in 2010 and 2011were used to compare the ability of students to make connections between the results from lab measurements and patient assessment.
- Measured changes in perceived gains on two course objectives
- Shifts in the survey questions that measure engagement
- Feedback on modules to tweak new course design

Assessment comparison

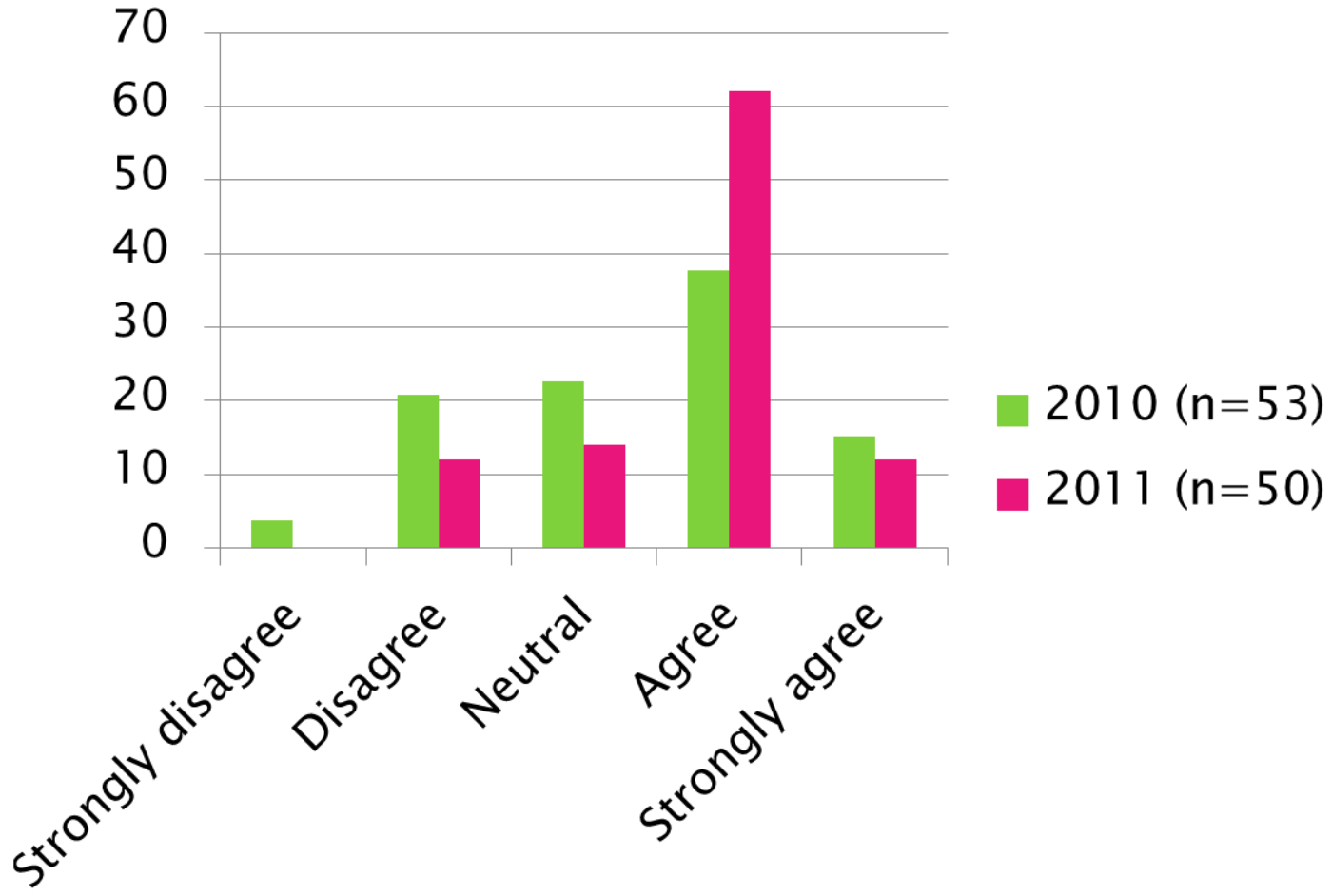
- Grades on the CB questions on exam increased 20%, but grades in all components of the course were better in 2011

- In 2010 Clinical Biochemistry lowered students' overall grades by 4.67%, in 2011 by 1.47%

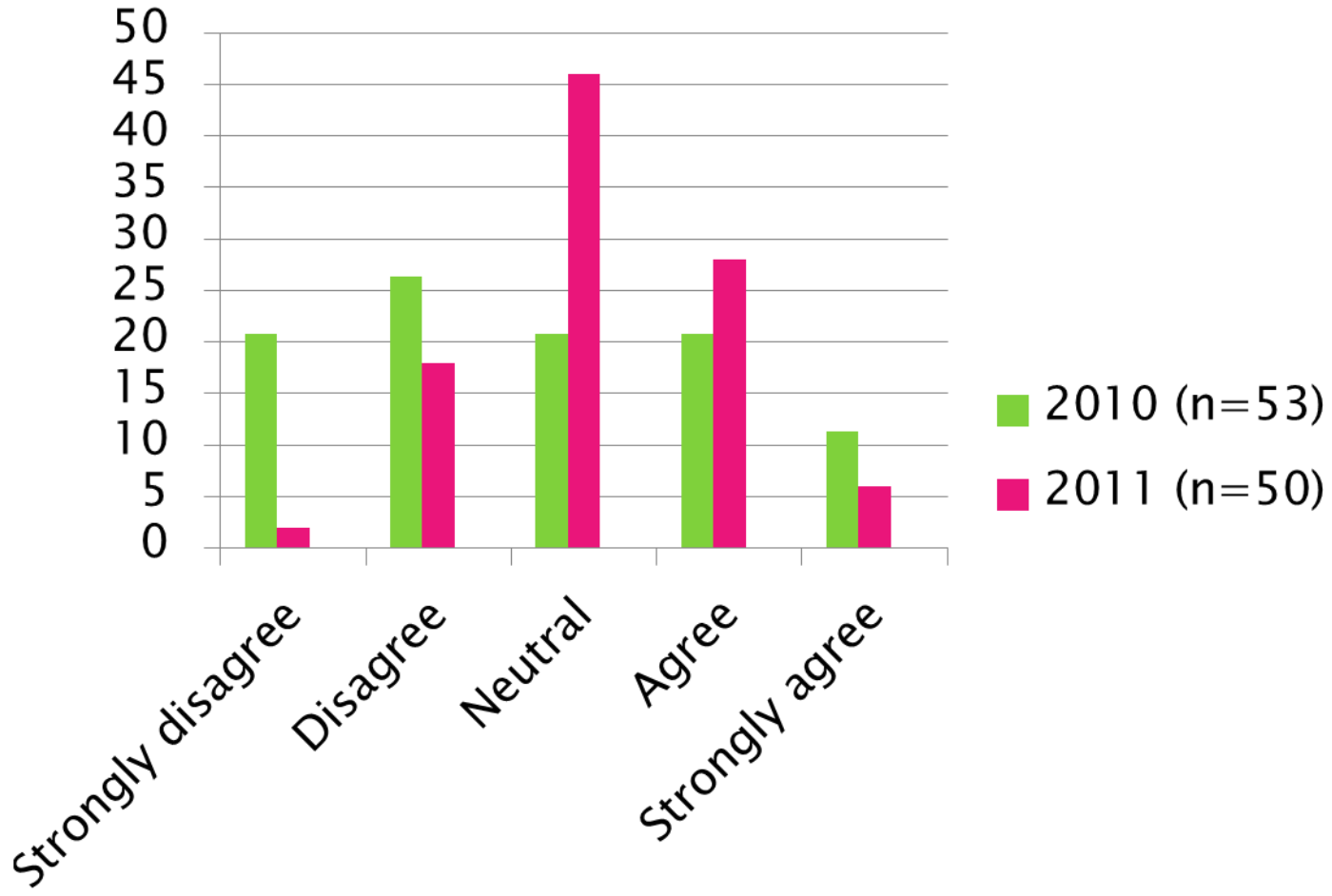
Course value and engagement before and after the redesign

- This component of Pharm 220 increased my interest in the subject
- What I am learning in this class will be important in my future
- Students shared their ideas/knowledge in this component of Pharm 220
- This component of Pharm 220 encourages questions and ideas
- I felt very involved or engaged in this component of Pharm 220

This component of Pharm 220 increased my interest in the subject



I felt very involved or engaged in this component of Pharm 220



Learning gains before and after the redesign

- Your understanding of the role of lab results in patient assessment
- Your understanding of the development of a rational approach for interpreting laboratory data

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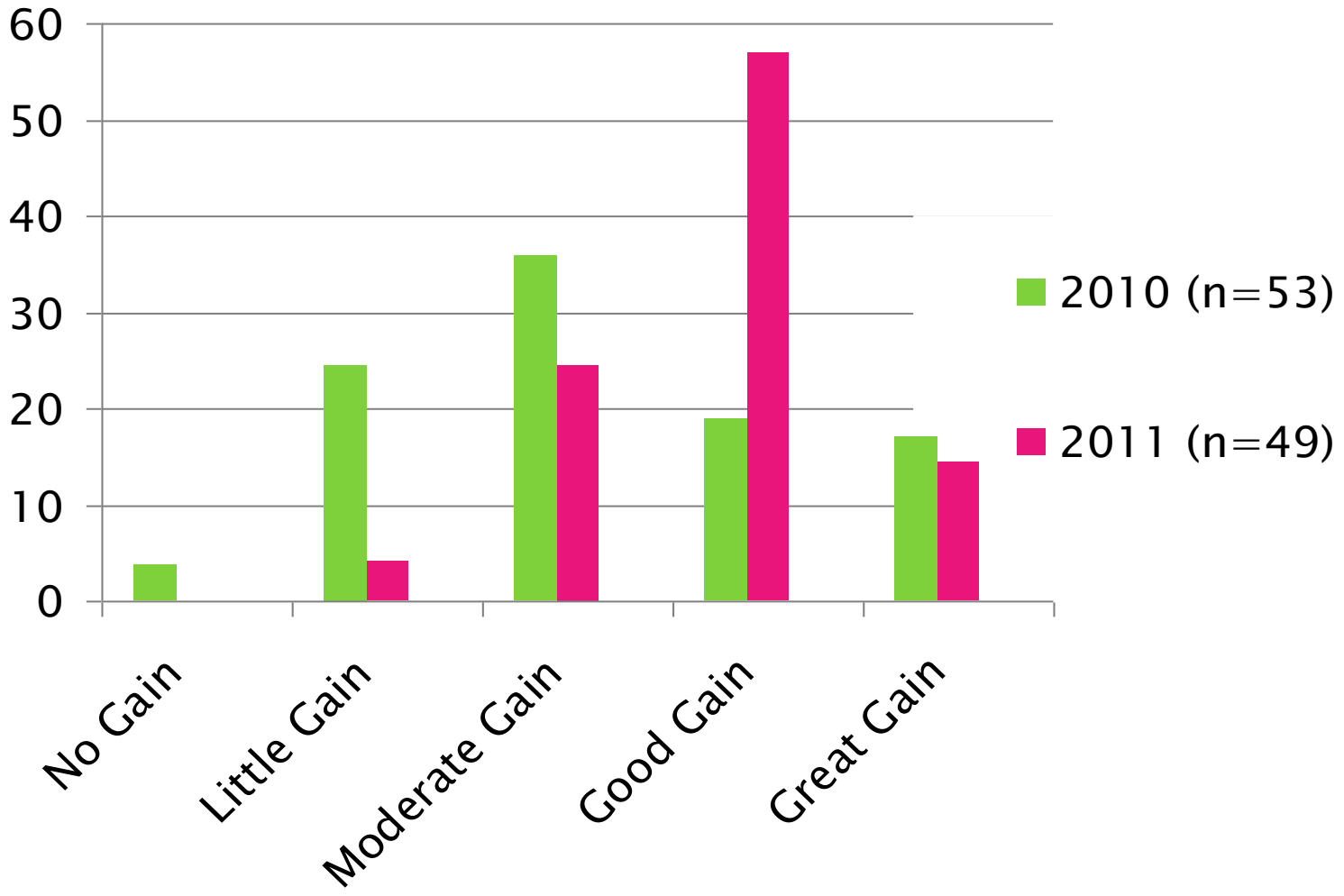
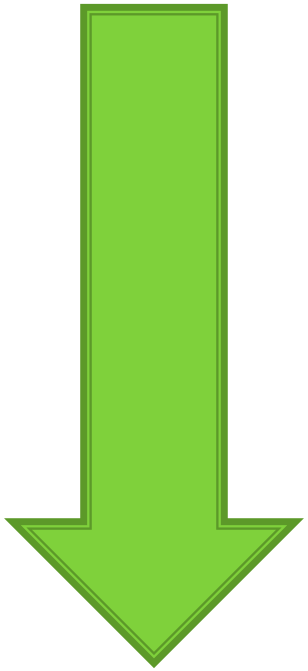


Effectiveness of online and tutorial components (most to least)

- Online self-assessment questions
- Billy's case study
- Face-to-face tutorial
- Virtual field trip
- Online discussion forum



Evaluation of online components

- Positives (33)
  - Provided situations for applied knowledge or problem solving
  - Allowed learning at individual pace, time flexibility
  - Case studies were helpful
  - Liked the assessment questions
- Negatives (7)
  - Having more tutorials would help

Evaluation of tutorial activities

- Positives (43)
  - Problem solving and case study applications clarified concepts
  - Discussing and talking through cases very helpful
  - Engaging with other students/doing group work valuable exercise
  - Case studies in general were beneficial
  - Questions (from online component) would be answered
- Negatives (6)
  - Not enough tutorials
  - Format not helpful – too long, material redundant, smaller cases needed

Next Steps ….

- No major changes to the online component.
- Include one question and answer period with instructor midway for questions about modules.
- Change the way the cases are discussed in the final tutorial so that students feel they are discussing both cases in-depth.