

Interactive

What word comes to mind
when you and your colleagues
think
of redevelopment? Innovation?
Dread? Excitement?

QR code will be provided
during the live presentation



Revamping, Blueprinting, and Assessing Anatomy and Physiology I in Adult Education

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Ashley Davis-Anthony, M.S.



GALEN COLLEGE OF NURSING

Introduction of Presenters



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Test Development Specialist





Galen at a Glance



13,000
Students

enrolled across
42 states

35,000+
Graduates

19 Campuses across
the United States *(plus online)*



- Asheville, NC
- Austin, TX
- Cincinnati, OH
- Dallas, TX
- Gainesville, FL
- Hazard, KY
- Houston, TX
- Louisville, KY
- Myrtle Beach, SC
- Nashville, TN
- Pembroke Pines, FL
- Pikeville, KY
- Richmond, VA
- Roanoke, VA
- Salt Lake City, UT
- San Antonio, TX
- Sarasota, FL
- Tampa Bay, FL
- Wichita, KS

Improving course learning through assessments – Our Journey

- We have spent the last year revamping our Anatomy & Physiology I course to ensure course consistency via multiple modalities (online, virtual, and on-ground).
- We blueprinted our course and standardized the content
- We began using formative assessments to assist students with retaining information
- We use summative assessment data to drive further modifications to enhance learning improvements and to evaluate mastery of Unit Student Learning Outcomes (USLOs).





Working across disciplines to develop assessments

Test development specialist and faculty who are subject matter experts (SMEs) collaborate to develop formative and summative assessments



We analyze assessment data to see where we can make improvements for student learning



Our Continual learning improvement efforts lead to

Remaining compliant & meeting accreditation standards

Improved student engagement & success

Staying current in andragogy & best practices



Presentation Learning Outcomes:

1. Describe the Redevelopment Process Using Backward Design
2. Describe the Blueprinting Process to Drive Consistency
3. Describe the Process of Assessment Creation
4. Describe the Assessment Review Process to Drive Learning Improvements



Outcome 1: Describe the Redevelopment Process Using Backward Design

- Selected SMEs from faculty members. Each SME worked on specific units for the new course. Faculty collaboratively created new USLOs to better align with Course Student Learning Outcomes (CSLOs).
- Faculty collaboratively worked within the syllabus to expand topical outlines for each USLO.
- Faculty created content for their designated units using the USLOs and topical outlines. SMEs peer-reviewed & provide feedback for all content to ensure accuracy and alignment to the USLOs
- Faculty made a conscious effort to use inclusive visuals, media, and language throughout each unit.

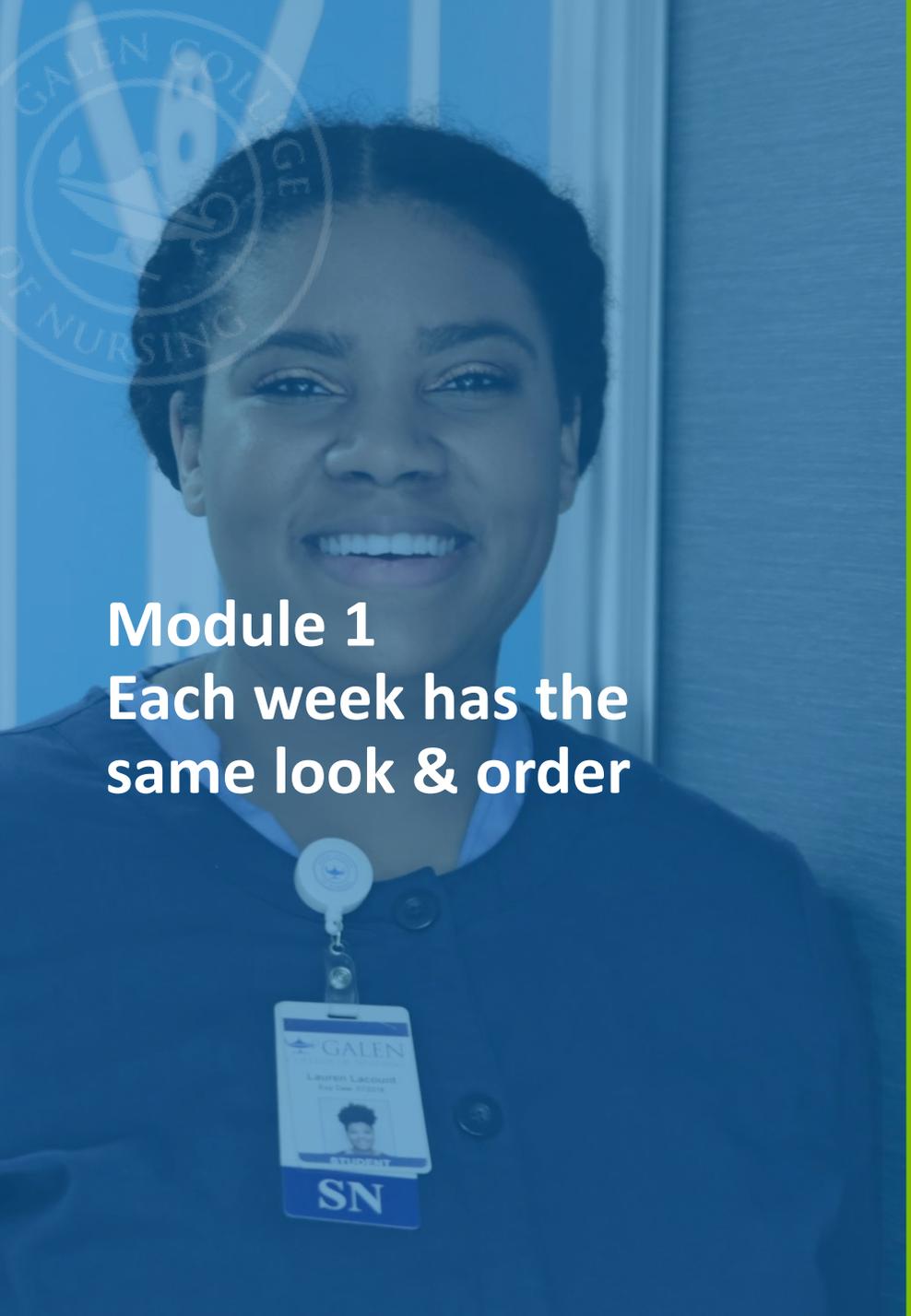




Syllabus Blueprint

Faculty collaboratively work within the syllabus on expanding topical outlines for each USLO.

Unit 1 - Introduction to the Human Body	
Topical Outline: Any changes to this syllabus will be communicated to the student in writing.	
Unit Student Learning Outcomes 1. Define life and the key components necessary for living systems to exist. (CSLO 6) 2. Identify the relationship between Anatomy and Physiology and their subdivisions. (CSLO 3) 3. Differentiate the levels of structural organization of the human body. (CSLOs 1, 2) 4. Classify the structure and function of the organ systems of the human body. (CSLO 3) 5. Differentiate mechanisms of homeostasis. (CSLO 4)	Number of Exam Questions (40% of Exam 1) 3-5 3-5 3-5 3-5 4-6
Theory	Required Readings and Learning Activities
Introduction to the Human Body <ul style="list-style-type: none"> • Define life and the key components necessary for living systems to exist (USLO 1.1). <ul style="list-style-type: none"> ○ Responsiveness to stimuli <ul style="list-style-type: none"> ▪ Maintenance of homeostasis ○ Growth and development ○ Reproduction ○ Movement <ul style="list-style-type: none"> ▪ Internal and external ○ Metabolism <ul style="list-style-type: none"> ▪ Anabolism ▪ Catabolism ○ Requirements for life <ul style="list-style-type: none"> ▪ Oxygen ▪ Nutrients ▪ Narrow range of atmospheric pressure ▪ Narrow range of temperature • Identify the relationship between Anatomy and Physiology and their subdivisions (USLO 1.2). <ul style="list-style-type: none"> ○ Anatomy and Physiology <ul style="list-style-type: none"> ▪ Microscopic Anatomy ▪ Cytology ▪ Histology ▪ Gross Anatomy ▪ Surface Anatomy ▪ Regional Anatomy ▪ Systemic Anatomy ▪ Developmental Anatomy ▪ Pathological physiology • Differentiate the levels of structural organization of the human body (USLO 1.3). <ul style="list-style-type: none"> ○ Chemical level ○ Cellular level <ul style="list-style-type: none"> ▪ Organelles 	Readings Betts et al, 2021 (OpenStax) <ul style="list-style-type: none"> • Chapter 1: An Introduction to the Human Body Activities and Assessments <ul style="list-style-type: none"> • Week 1 Discussion 2 / Reflection • Unit 1 Quiz



Module 1

Each week has the same look & order

Unit 1: Introduction to the Human Body		Complete All Items	✓	+	⋮
⋮	Unit 1: Overview View		✓		⋮
⋮	Activities to Complete		✓		⋮
⋮	USLO 1.1 The Key Components Necessary for Life View		✓		⋮
⋮	USLO 1.1 Practice Worksheet 100 pts Submit		✓		⋮
⋮	USLO 1.2 Anatomy, Physiology, and Their Subdivisions View		✓		⋮
⋮	USLO 1.2 Practice Worksheet 100 pts Submit		✓		⋮
⋮	USLO 1.3 Structural Organization of the Human Body View		✓		⋮
⋮	USLO 1.3 Practice Worksheet 100 pts Submit		✓		⋮
⋮	USLO 1.4 Structure and Function of the Organ Systems View		✓		⋮
⋮	USLO 1.4 Practice Worksheet 100 pts Submit		✓		⋮
⋮	USLO 1.5 Mechanisms of Homeostasis View		✓		⋮
⋮	USLO 1.5 Practice Worksheet 100 pts Submit		✓		⋮
⋮	Assignments to Complete		✓		⋮
⋮	Week 1 Discussion Apr 12 100 pts Contribute		✓		⋮
⋮	Summer: Unit 1 Quiz Apr 12 100 pts		✓		⋮
⋮	Supplemental Information		✓		⋮
⋮	Chapter 1 Supplemental PowerPoint		✓		⋮



Inclusive media



Outcome 2: Describe the Blueprinting Process to Drive Consistency

- We began blueprinting to ensure every student in every state, and every modality, was getting an equitable experience. This helps support accreditation standards.
- We use the Learning Management System (LMS) Canvas to create a blueprint course which can then be copied into all live student-facing courses. The blueprint course can be updated at any point in the term to correct any issues that may arise.
- Any needed assessment changes can be fixed before students complete the assessment, thereby improving its quality.



Blueprinting

Ensures equitable learning across teaching modalities

It works in all formats

- Most of our Arts & Sciences courses offer multiple teaching modalities:
 - 20 campuses and nearly 200 faculty need consistency
 - On-ground – in-person classroom instruction
 - Virtual - synchronous classes via Zoom at set days and times
 - Online - asynchronous, online instruction



Blueprinting

Standardized Course Content

Creating consistency in learning

Meeting compliance

- Modules were created for each unit student learning outcome.
- Each module includes:
 - Interactive lessons that align with USLOs
 - Small group activities to enhance student engagement
 - Supplemental study materials
 - Course assignments/assessments
 - All clearly outlined in the syllabus



Blueprinting

Issues corrected in real time to all courses

Synch all course for updates

- Update a settings that may be incorrect
- Update a broken or incorrect link
- Update instructions for more clarification. (e.g. Your project must be in APA format as a paper NOT a PowerPoint).



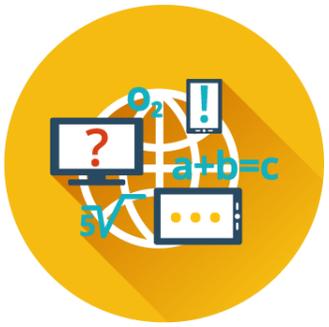
Blueprinting

Improving quality

Improving the learning experience

- Faculty review formative and summative assessments
- Learning gaps can be identified
- Accuracy and consistency in the content delivered is key to student success





Interactive

2. How do you address consistency within your program?
(i.e. shared syllabus, shared exams, or norming sessions
for grading)

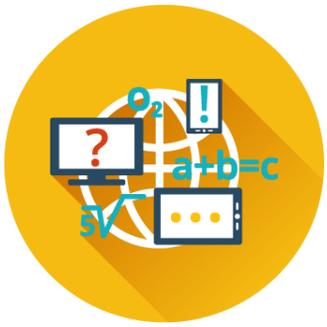
Live conversation



Outcome 3: Describe the Process of Assessment Creation

- Faculty are responsible for creating formative and summative questions for assessments. All course assessments are then peer-reviewed by the SMEs before implementation.
- Assessments are specifically tied to individual USLOs to ensure students are tested on all material.
- Formative assessments are created for individual USLOs, so students can practice small amounts of content at a time.
- Low-stakes summative assessments (quizzes) cover all USLOs for an entire Unit so students can gauge their mastery of unit content before completing high-stakes assessments .
- High stake assessments are summative exams over several (2 to 4) units at a time.





Interactive

3. We use formative and summative assessments in our courses.

What type of assessments are you currently using in your courses?

QR code will be shared during the live presentation





Example Worksheet Question

Matching summative and formative assessments to USLO's

USLO 1.1 Worksheet - Define life and the key components necessary for living systems to exist.

Anabolism

is the process whereby smaller, simpler molecules are combined into larger more complex substances. While

catabolism

is the process by which larger more complex substances are broken down into smaller simpler molecules.



Example Quiz & Exam Questions

BIO 1100-USLO 1.1-Quiz Bank-



Matching | Question USLO 1.1

Please match the following terms with the correct description.

Anabolism

Building complex molecules fr

Catabolism

Breaking down larger comple

Exam 1

Multiple Choice | Question USLO 1.1

_____ is the process whereby smaller, simpler molecules are combined into larger, more complex substances.

- Anabolism
- Catabolism
- Digestion
- Absorption

Identifying Learning Gaps

- Early intervention improves student performance on high-stake assignments
 - Student self-reflection
 - Student self-actualization
 - Faculty can review challenging topics and get immediate feedback of what to reinforce with students during lecture





Learning Mastery Grade Book

5 / 3	4.83 / 3	4.17 / 3	3.92 / 3	3.75 / 3	4.67 / 3	3.83 / 3	4.67 / 3	4.5 / 3	4.89 / 3
USLO 2.7 Des...	USLO 2.3 Loc...	USLO 2.4 Des...	USLO 2.5 Exp...	USLO 2.1 Des...	USLO 2.2 Ide...	USLO 2.6 Pre...	USLO 1.4 Rec...	USLO 1.3 Ide...	USLO 1.1 Rec...
5 / 3	5 / 3	5 / 3	5 / 3	5 / 3					
5 / 3	5 / 3	5 / 3	2.5 / 3	2.5 / 3					
5 / 3	5 / 3	5 / 3	5 / 3	5 / 3					
5 / 3	5 / 3	5 / 3	5 / 3	2.5 / 3					
5 / 3	5 / 3	5 / 3	5 / 3	5 / 3					
5 / 3	5 / 3	5 / 3	5 / 3	0 / 3					
5 / 3	5 / 3	5 / 3	5 / 3	5 / 3					
5 / 3	5 / 3	5 / 3	5 / 3	5 / 3	5 / 3	5 / 3	5 / 3	5 / 3	5 / 3
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5 / 3	5 / 3	2.5 / 3	2.5 / 3	0 / 3	5 / 3	0 / 3	0 / 3	5 / 3	5 / 3

USLO 1.4 Recognize the common planes of the human body.

■ Exceeds Expectations
■ Meets Expectations
■ Does Not Meet Expectations

Mastery set at: 3

Calculation Method: 65/35 Decaying Average

What do Students think of the new course design?

- Each quarter we collect student surveys regarding course satisfaction
 - Surveys are in house generated surveys
 - Quantitative and Qualitative data is collected
 - Feedback is provided
 - For the individual faculty – praises and areas to improve upon
 - For us to re-assess as a group how the overall course is doing

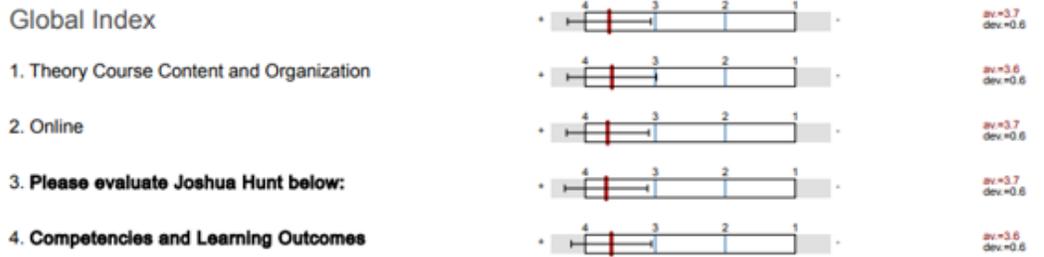


Aggregated (In-House) Student Satisfaction Survey

Compilation 1 06/28/2023-01:38:56 pm
 No. of responses = 803



Overall indicators



Survey Results

1. Theory Course Content and Organization

Statement	Strongly Agree	Agree	Disagree	Strongly Disagree	n	av	md	dev
1.1) The course requirements (evaluation methods, course student learning outcomes, attendance, participation, assignment, etc.) were clearly					795	3.7	4.0	0.5
1.2) Course content was organized in a manner that facilitated learning.					793	3.7	4.0	0.6
1.3) Evaluation methods (quizzes, tests, group projects, papers, portfolios, etc.) measured course objectives.					793	3.6	4.0	0.6
1.4) The required textbook(s) was essential for my learning.					791	3.5	4.0	0.7
1.5) The classrooms are conducive to achieving the student learning outcomes.					786	3.6	4.0	0.7
1.6) Sufficient opportunity to practice what was learned was provided.					796	3.6	4.0	0.6

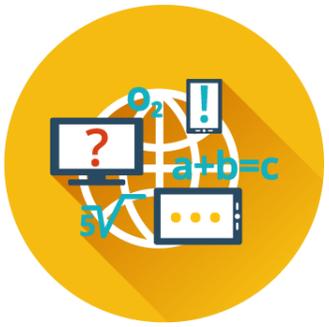
BIO 1100

Student Comments

What contributed most to your learning in this course?

- All the activities that I was required to do really helped me understand the foundations of A&P 1 theory.
- I enjoy how the lessons and assignments are put into the modules.
- The practice worksheet helped me in understanding the course in a better way.
- The interactive modules, discussion posts, and practice worksheets





Interactive

4. How many of you utilize your assessment data for course changes?

QR code will be shared during the live presentation



Outcome 4: Describe the Assessment Review Process to Drive Learning Improvements

- Post examination, faculty evaluate exam data (Item Analysis (IA) calls), identify poor performing questions, and discuss needed actions. Faculty drive changes to assessment questions based on the data.
- We create test banks for individual USLOs based on Bloom's Level of taxonomy to create our exams. The data reflects which USLOs (and Bloom's level) students are still struggling with.
- We use this information to drive future changes to the course and provide students with additional content, resources, or formative assessments to enhance their mastery of this content.
- Faculty are also able to use exam data to focus on difficult concepts in their courses to bolster mastery of the content.
- Data shows correlation of success rate with completion of formative assessment to higher summative assessments.



Exam Makeup

Exam 1: Units 1 & 2

Instructions

You have 50 questions and 60 minutes to take this exam.
Once the timer begins, you will not be able to stop it so make sure that you have a secure internet connection before you start.
Use a laptop or desktop computer, do NOT use your phone or tablet.
Use Chrome or Firefox as your browser and do not leave the exam page. All exams are closed book. Navigating away from the exam page will be considered cheating and will result in a zero.
Please do not use Internet Explorer or the Safari browser when taking the exam, this may cause some of the images to not display properly.

1 - 4 BIO 1100-USLO 1.1-Exam Bank-Knowledge-Spring

4 questions pulled randomly from bank: **BIO 1100-USLO 1.1-Exam Bank-Knowledge-Spring**
2 points per question

5 - 7 BIO 1100-USLO 1.2-Exam Bank-Knowledge-Spring

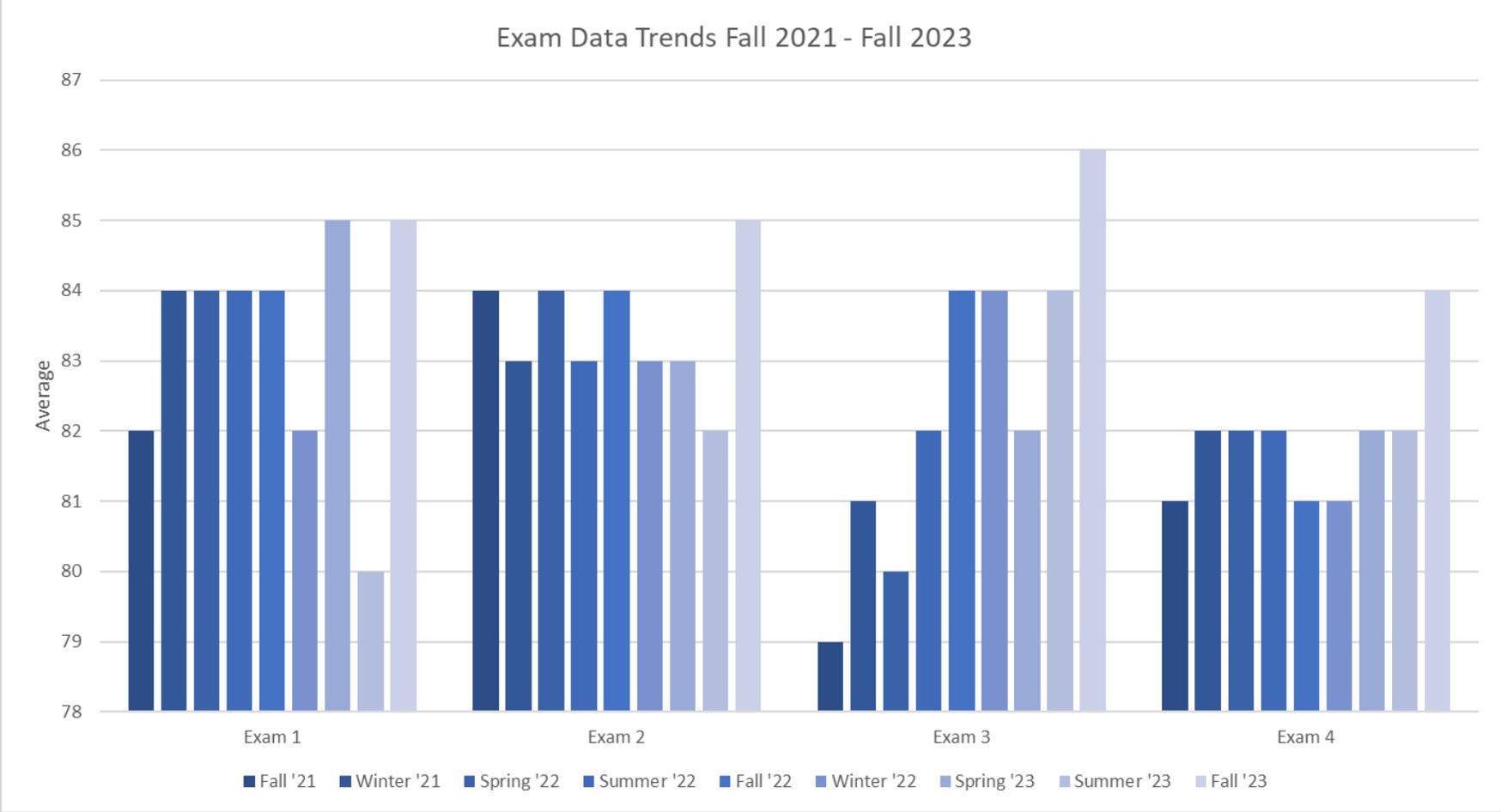
3 questions pulled randomly from bank: **BIO 1100-USLO 1.2-Exam Bank-Knowledge-Spring**
2 points per question

8 - 11 BIO 1100-USLO 1.3-Exam Bank-Knowledge-Spring

4 questions pulled randomly from bank: **BIO 1100-USLO 1.3-Exam Bank-Knowledge-Spring**
2 points per question



Average Exam Grades



Post Exam Review

Improving the quality to improve
the learning experience

- Faculty review quizzes individually
- Faculty review exams after test day
- Test development specialist provides item analysis (IA) data for faculty review
- Collaboration ensures quality



Exam Statistics ("New Quizzes")

Exam 1: Units 1 & 2

100%
High Score

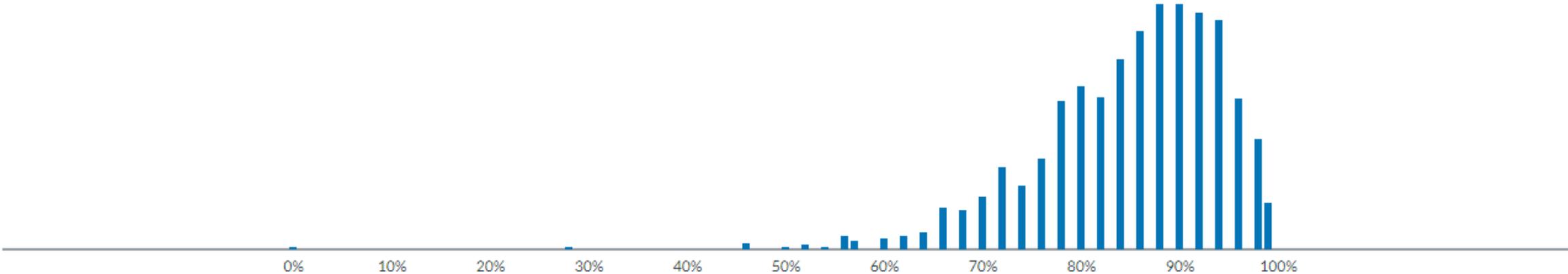
0%
Low Score

85%
Mean Score

9.794
Standard Deviation

38:11
Mean Elapsed Time

0.653
Cronbach's Alpha



Data Last Updated: Sep 28, 2023



Exam Statistics ("New Quizzes")

Multiple Choice | 2 points possible

Which substance do humans have the most urgent need for a continuous supply of?

0.89

Difficulty Index

0.10

Discrimination Index

1.00

RPB

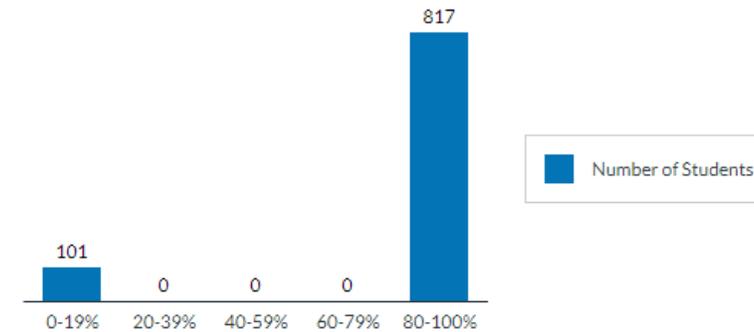
1.78/2 pts

Mean Earned Score

Answer Frequency Summary

	Answer	Respondents	%
✘	Water	95	10%
✔	Oxygen	817	89%
✘	Nitrogen	0	0%
✘	Food	2	0%
✘	(No answer)	4	0%

Performance by Quintile



Outcomes

📍 USLO 1.1 Define life and the k...



Exam Statistics ("Old Quizzes")

Spring 2022						
Question Title	Difficulty Index	Point Biserial of Correct	Point Biserial of Distractor 2	Point Biserial of Distractor 3	Point Biserial of Distractor 4	
_____ is a molecule that allows for muscle relaxation	0.210526	0.239322	-0.09012	-0.06953	-0.07297	
The active form of vitamin D is produced by the kidneys	0.257453	0.260092	-0.16429	-0.04074	-0.08543	
During an isotonic contraction, the muscle fibers will	0.27381	0.209969	0.002815	0.036003	-0.26554	
Below is a list of the steps at the neuromuscular junction	0.351351	0.305055	-0.17496	-0.06759	-0.15556	
What happens when the calcium is pumped back into the sarcoplasmic reticulum?	0.352381	0.344662	-0.0543	-0.19873	-0.19066	
Glycolytic fibers use anaerobic glycolysis as the primary energy system	0.368932	0.265993	-0.06924	-0.17713	-0.05859	
Which of the following represents the correct sequence of events?	0.412791	0.273193	-0.09367	-0.14341	-0.125	

Difficulty Index <.3, very difficult question. Consider revamp.
PBS of Key (Correct Answer) <.25; low discrimination of high/low students getting correct.
PBS of Distractors >0; more 'attractive' than the correct answer. Consider revamp.



IA Summary

Multiple Choice | 2 points possible

What organelle would be responsible for protein folding?

0.41 Difficulty Index 0.25 Discrimination Index 1.00 RPE 0.82/2 pts Mean Earned Score

Answer Frequency Summary

Answer	Respondents	%
✘ Ribosomes	268	48%
✘ Lysosomes	11	2%
✘ Mitochondria	49	9%
✓ Golgi apparatus	231	41%
✘ (No answer)	3	1%

Performance by Quintile

Performance Range	Number of Students
0-19%	231
20-39%	0
40-59%	0
60-79%	0
80-100%	231

Outcomes

USLO 3.1 Identify the organel...

Faculty Driven: Karl P—Golgi is not a correct answer, and I cannot find any reference to this organelle being involved in protein folding in the textbook or course media. How would students know to choose Golgi?

Give credit for all. Reworked-What organelle would be responsible for protein packaging? (Goli now correct and Ribosomes changed to Smooth ER)



Summary

We hope that by sharing our experiences, we have provided ideas for:

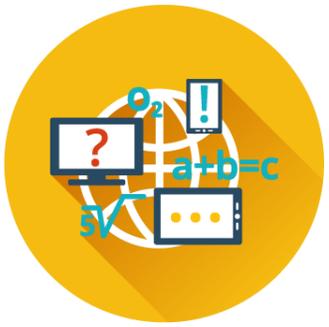
- How to create formative and summative assessments that map back to learning outcomes
- How to improve the educational environment through standardization
- How to analyze your assessment data to drive change
- Feel confident in your ability to assess student learning, engagement & assessment for better student success



References

- Betts, J.G., Young, K.A, Wise, J.A., Johnson, E., Poe, B., Kruse, D., ... Desaix, P. (2022). Anatomy and Physiology. OpenStax. Retrieved from <https://openstax.org/details/books/anatomy-and-physiology-2e>
- Galen, 2021.USLO:1.1:*The Key Components Necessary for Life*.(Rise Presentation).Canvas. https://classroom.galencollege.edu/courses/3864071/pages/uslo-1-dot-1-the-key-components-necessary-for-life?module_item_id=101697290
- Galen, 2021.USLO:1.1:*The Key Components Necessary for Life*.(Worksheet).Canvas. https://classroom.galencollege.edu/courses/3864071/assignments/43653553/edit?module_item_id=101697307&quiz_lti=true





Questions

- What is one thing you can take back and implement from this presentation?

Live conversation

