INNOVATORS in EDUCATION
Transforming Curricula for the Next Generation of Learners

Spring 2020 | Volume 07
I am proud to introduce our 2019-2020 Innovators in Education. This booklet highlights our two most recent cohorts who are transforming curricula: Cohort 9 from the UNMC Funded Awards Program and Cohort 5 from the uBEATS Development Program.

UNMC Cohort 9 comprises seven teams of 23 student developers and 12 faculty advisors from Omaha, Lincoln, and Kearney. One of the key factors of their success was the collaborative partnership between the two groups. Faculty led the projects with the commitment to incorporate the e-modules into their courses and consulted with students to generate creative ideas. In turn, students offered creative engagement and e-learning development skills.

uBEATS Cohort 5 comprises 11 teams of 25 developers from the University of Nebraska Omaha, some of whom are repeat participants or graduates of the UNMC High School Alliance. uBEATS developers come from varying collegiate backgrounds to create engaging e-modules for students in grades 6 - 12. Their projects will be included in the 65+ e-modules that have the potential to impact up to 90,000 Nebraska students.

I want to express my gratitude and appreciation for all the hard work that went into the creation of these e-learning projects. These contributions by our faculty, students, and UNO collaborators are more important than ever in light of all the changes to the educational landscape due to the COVID-19 pandemic.
To ensure our dedication to training faculty and students in all aspects of e-learning, we’ve gathered a team of representatives from all areas of campus, including faculty, staff, and students, as well as nationally renowned experts in the area of e-learning.
INTERACTIVE E-LEARNING TEAM

H. Dele Davies, MD, MS, MHCM
Senior Vice Chancellor for Academic Affairs

Peggy Moore, MSEd
Director & Instructional Designer, E-Learning
Assistant Professor, College of Allied Health Professions

April Elker
Program Coordinator
E-Learning

Steph Langel, MS
Instructional Designer
E-Learning

Tuggen Even, MSEd
Instructional Technologist
E-Learning

Crista Goehring, MSEd
uBEATS Curriculum & Education Specialist
E-Learning

Megan Blusys
Communications & Media Specialist
Academic Affairs

EXTERNAL ADVISORY BOARD EMERITUS MEMBERS

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Senior Vice President for Global Strategic Alliances
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Founder, CEO, and Chief Medical Officer, PHLT Consultants
Chief Medical Officer, MedMD Inc.

Ray Shroeder
Associate Vice Chancellor for Online Learning
University of Illinois, Springfield

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Program Director & Associate Professor
College of Allied Health Professions

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Director & Instructional Designer, E-Learning
Assistant Professor, College of Allied Health Professions

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Associate Dean for Academic and Student Affairs
& Associate Professor
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Graduate Studies

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Senior Instructional Designer
Information Technology Services

Saihari (Shaker) Dukkipati
Student Senate
College of Medicine

William Glass, MS
Director, Visualization and Technology
iEXCEL

Donald G. Klepser, PhD, MBA
Associate Professor
& Associate Dean for Academic Affairs
College of Pharmacy

Suhasini Kotcherlakota, PhD
Assistant Professor & Instructional Designer
College of Nursing

Linda M. Love, EdD
Director, Faculty Development
Assistant Professor, College of Medicine

Mary P. Niemiec, MA
Director, University of Nebraska Online Worldwide
Associate Vice President, University of Nebraska
Distance Education

Frank Pietrantoni, MS
Director
Office of Health Professions Education
Nebraska Medicine

Yun Saksena, BDSc, MMSc, DMD
Associate Dean for Education
College of Dentistry

Lynnette Leeseberg Stamler, PhD
Associate Dean & Professor
College of Nursing

Janice Tompkins, MPH, MT(ASCP)
Assistant Dean for Academic Affairs
College of Allied Health Professions

MEMBERS

Peggy Moore, MSEd
Director & Instructional Designer, E-Learning
Assistant Professor, College of Allied Health Professions

Jay Moore, MD
Senior Associate Dean for Academic Affairs
College of Medicine

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Nebraska Medicine

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College of Dentistry

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Associate Dean & Professor
College of Nursing

Janice Tompkins, MPH, MT(ASCP)
Assistant Dean for Academic Affairs
College of Allied Health Professions
Funded Awards Program

The Funded Awards Program is a collaborative partnership between faculty and students. Faculty lead the projects with the commitment to incorporate the e-modules into their courses and consult with students to generate creative ideas; in turn, students offer engagement options and content development skills.
Tracking a patient’s function is an important part of a physical therapy plan of care. Recently, the Center for Medicare & Medicaid Services mandated a new outcome measure, Section GG, to track patient progress in multiple settings following acute care.

Due to its novelty, Section GG is relatively new to all clinicians (including students) yet is integral in reimbursement within multiple practice settings. Facilitating understanding and adequate implementation of this measure is the primary goal of this content.

Learning about standardized outcome measures, by nature, lacks excitement. Our interactive module serves to introduce this content in a manner that leads to early understanding and application of the information through videos, patient scenarios, and quizzes in a flipped classroom.

This formative feedback should improve student performance in the use of the Section GG tool during real patient care in a clinical setting.

While this module is intended to be utilized prior to formal class discussion, it will be easily available to students in preparation for exams and future clinical experiences.
Clinical reasoning is one of the most challenging skills for healthcare profession students to master. The ability to synthesize and integrate patient information to establish an appropriate differential diagnosis is essential in providing great patient-centered care.

This module imitates the flow of an actual physical therapy examination and diagnosis, so learners can easily apply and transfer their skills to in-person patient care.

The module allows learners to collect information by reviewing patient intake paperwork, viewing videos, and clicking through various objective findings. As the learner gathers more information, they must use clinical reasoning skills to establish a hypothesis list of possible diagnoses and then eventually narrow this list down to a primary diagnosis. This enables learners to practice the clinical reasoning process at their own pace while moving through an examination that imitates the steps and processes carried out in an actual physical therapy examination.

Learners may use this module as a stand-alone learning activity or as an opportunity to practice the clinical reasoning and differential diagnosis process prior to an in-class discussion. They will be randomized to receive feedback at each step in the process, or delayed feedback at the end of the module. Outcomes will be assessed through a statistical comparison of the learner’s primary diagnosis to an expert’s primary diagnosis. In addition, learners will fill out a survey indicating how useful they found the module.

The lack of healthcare education regarding nutrition is one of many barriers that exist in the provider-patient relationship; moreover, many healthcare providers have expressed a lack in basic nutritional education. This perpetuates myths and misinformation that ultimately decreases the quality of care. In short, many students who become providers feel inadequately prepared to discuss nutrition with patients, and consequently, outcomes decrease.

This e-module would begin to decrease the gap that exists in provider knowledge by establishing a foundation for nutritional education and literacy for students training to become healthcare professionals.

The e-module utilizes the Nutrition Facts label standardized by the Food and Drug Administration to identify and explain macronutrients. Additional topics include energy and serving sizes. Since the e-module has many interactive components, this will aid in application and understanding. Some interactions include matching questions, entering in values relation to the Nutrition Facts label, and calculating energy requirements.

While the gap in knowledge that exists for many healthcare providers will not be completely filled by this e-module, it is a great place to start. Additionally, by teaching using the Nutrition Facts label standardized by the Food and Drug Administration, we present material in a way that can be easily relayed to patients given the ubiquitous nature of the label. Finally, we have many options and ideas for how to utilize or implement this e-module, including in medical education or residency programs.
Green Sheet

Green Sheet is a full head-to-toe physical exam that is learned and performed during the first year of PA school; these clinical skills are mastered prior to going on clinical rotations.

This e-module is a visual and auditory guide to aid students in their learning of the Green Sheet. It provides an interactive way to learn each component of the physical exam that includes how to do it correctly and why it is done in such a way.

By using an interactive e-module to teach students about the different components of the Green Sheet physical exam, it creates an opportunity for hands-on learning that will promote retention of the skills. Using several types of assessments throughout the e-module also facilitates retention and keeps the student on pace to learn the objectives.

The module is intended to be used week to week to learn the skills prior to practicing them in the Clinical Skills Lab. This way, students will learn how to do the skills correctly and the reason for doing each component of the physical exam.

FACULTY PROJECT DIRECTOR
Jon Kilstrom, MPAS, PA-C, NRP
College of Allied Health Professions

STUDENT TEAM MEMBERS
Lorna Hummel
College of Allied Health Professions
Class of 2021

Haelee Kowalski
College of Allied Health Professions
Class of 2020

Darren Stoub
College of Allied Health Professions
Class of 2021

Knowledge of primary and permanent tooth eruption is important to inform the patient of the normal eruption timeline and identify dental anomalies sooner. This topic is typically presented with a timetable flooded with eruption dates for students to memorize. Students may find it overwhelming and hard to retain the information.

This module will walk the learner through the primary and permanent tooth eruption timeline by utilizing animation, panoramic radiographs, interactive quizzes, and vocal recordings to help with information retention in a time-efficient manner.

In the e-module, students navigate through the panoramic radiographs and eruption charts accompanied by captions and vocal recordings explaining the material. The e-module is divided into primary and permanent dentition groups and utilizes various methods, such as animation, to make it enjoyable for students to remember and enhance engagement. Each section will have a short quiz to ensure the students retain key points. There is also a summative assessment at the end to help the students test their retention. The menu on the left allows students to review whichever part they want to review conveniently.

This e-module will not only increase students’ ability to identify tooth number on panoramic radiographs but also master primary and permanent tooth eruption sequence in a time-efficient manner. Students will feel more confident when seeing patients, especially children with primary and mixed dentition with regards to interpreting panoramic radiographs and recognizing any anomalies after going through this module.

FACULTY PROJECT DIRECTOR
Sung Kim, DDS
College of Dentistry

STUDENT TEAM MEMBERS
Bo Chao
College of Dentistry
Class of 2022

Safia Rauf
College of Dentistry
Class of 2022
Intraosseous Line Placement

Intraosseous (IO) line placement is an important, rarely used, emergency vascular access procedure. In situations without IV access, or adequate IV access, an IO line can provide the required vascular access for administration of critical medications and fluids.

This e-module reviews the indications, contraindications, site selection, landmarks and other key components for intraosseous line placement.

It promotes retention of the material through image-based landmark identification and interactive learning components focusing on the four key locations for adult IO line placement used in medical care. Interactive components allow the viewer to see key aspects of the placement and understand how intraosseous line administered medications and fluids return to the systemic venous circulation.

A series of questions at the end of the module will confirm the learners’ understanding of the material presented. As well, the format will allow learners to review this material on a mobile device and could be used as a training refresher prior to performing a critical, rarely used procedure.

This module was created with the intention of use for medical student training and has been used in the March 2020 medical student course for IO line training.

Cultural Awareness

It is imperative that future healthcare providers are aware of cultural differences, and treat patients the way their patients want to be treated in order to optimize patient/person-centered care. This awareness is also important for interactions with staff, families and friends of relatives, and other colleagues and members of the healthcare team.

This interactive module will include commonly faced scenarios in the healthcare setting where the importance of cultural awareness will be highlighted (dental examples are used but they would be generalizable to other health professions).

To promote better retention and application of course material, the module is divided into short sections with animations of real-life health care scenarios, and some important definitions and principles for patient communication and management. Interactive components are embedded throughout the module, and knowledge and key concepts will be assessed intermittently for reinforcement and at the end.

The sections will cover concepts of cultural difference, implicit association/bias, assessing situations objectively, using communication skills effectively, decision making to take culturally aware and appropriate actions with practice navigating scenarios.

The project can be used for pre-work for flipped learning or for blended learning. It could also be used for staff and faculty training. Learners will need to assess situations, reflect on their own inclinations and reactions, and think about best practices for patient care.

FACULTY PROJECT DIRECTOR

Nicholas W. Markin, MD, FASE
College of Medicine

STUDENT TEAM MEMBERS

Bobby Muelleman, MD
Resident
College of Medicine

John Riley, MD
Resident
College of Medicine

John Radio, MD
Resident
College of Medicine

Meg Thacker
College of Medicine
Class of 2020

ADDITIONAL FACULTY ADVISORS

Alicia Schiller, PhD
College of Medicine

Amy Cutright, MD
College of Medicine

FACULTY PROJECT DIRECTOR

Yun Saksena, BDSc, MMSc, DMD
College of Dentistry

STUDENT TEAM MEMBERS

Jordan Brozek
College of Dentistry
Class of 2023

Maddison McConaghy
College of Dentistry
Class of 2021

Christine Scanlan
College of Dentistry
Class of 2023

Olivia Straka
College of Dentistry
Class of 2021

ADDITIONAL FACULTY ADVISOR

Luana Oliveira-Haas, DDS, MS, PhD
College of Dentistry
uBEATS

UNO & UNMC Building Excellence in Academics Through STEM (uBEATS) is a series of health science e-modules designed for grades 6 – 12 to enhance existing curriculum and provide advanced information on top of what students learn in the classroom.

uBEATS was made possible by the generous support of the Chancellor’s Math & Science Program Fund, the Claire M. Hubbard Foundation, The Elenore Gakemeier Swarts eLearning Fund, and The Sherwood Foundation.
GRADES 6 – 8: PATHOLOGY & MICROBIOLOGY

Specialized Cells: Sensory Pathways

PROJECT DEVELOPERS
Mohammed Alfarra
UNO Student
Logan Duryee
UNO Student

PROJECT SUMMARY
What would cause you to lose your sense of smell or sight? This module describes the sensory pathway and how problems along the pathway can cause loss of a particular sense. Users also learn treatment options for various types of blindness.

GRADES 11 – 12: PHARMACOLOGY

Introduction to FDA Approval

PROJECT DEVELOPERS
Leonardo Alvarado
UNO Student
Annika Kuchar
UNO Student

PROJECT SUMMARY
You hear a lot about FDA approval, but what does it really mean? This module describes the role of the FDA in the drug approval process, how the agency regulates various types of drugs, and the difference between brand-name and generic drugs.

GRADES 11 – 12: PHARMACOLOGY

Pharmacognosy

PROJECT DEVELOPERS
Mary Ann Awiukiewicz
UNO Student
Megan Bengier
UNO Student

PROJECT SUMMARY
Natural remedies have become incredibly popular lately, but there are still a lot of questions surrounding them. This module helps the learner recognize that pharmacologic and toxicologic chemicals can be found in nature. It also illustrates that herbals can interact in the body the same way as compounds developed by chemists.

UNO COLLABORATORS
Hesham Ali, PhD
College of Arts and Sciences

Nancy Edick, EdD
College of Education

Dana Richter-Egger, PhD
College of Arts & Sciences

Sarah Edwards, PhD
College of Education

Adam Rosen, PhD
College of Education

Kelly Gomez-Johnson, EdD
College of Education

Katie Shirazi, PhD
College of Arts and Sciences

Neal Grandgenett, PhD
College of Education

Robert Shuster, PhD
College of Arts & Sciences

UNMC COLLABORATORS
Jaynie Bird, MEd
High School Alliance

Crista Goehring, MSEd
E-Learning

Terri Gulick, MS
High School Alliance

Joseph Rohr, MD, PhD
College of Medicine

Chris Shaffer, PharmD, BCPS
College of Pharmacy

Corey Hopkins, PhD
College of Pharmacy

Geoffrey A. Talmon, MD
College of Medicine

Meg Johnson
NU Foundation

Frank Tworek, PhD
E-Learning

Heidi Kaschke
High School Alliance

Gary Yee, PharmD, FCCP, BCOP
College of Pharmacy

Peggy Moore, MSEd
E-Learning

Dele Davies, MD, MS, MHCM
Academic Affairs

Corey Hopkins, PhD
College of Pharmacy

April Elker
E-Learning

Maurice Godfrey, PhD
Munroe-Meyer Institute

Scot Ouellette, PhD
College of Medicine

Jaynie Bird, MEd
High School Alliance

Crista Goehring, MSEd
E-Learning

Terri Gulick, MS
High School Alliance

Joseph Rohr, MD, PhD
College of Medicine

Chris Shaffer, PharmD, BCPS
College of Pharmacy

Corey Hopkins, PhD
College of Pharmacy

Geoffrey A. Talmon, MD
College of Medicine

Meg Johnson
NU Foundation

Frank Tworek, PhD
E-Learning

Heidi Kaschke
High School Alliance

Gary Yee, PharmD, FCCP, BCOP
College of Pharmacy

Peggy Moore, MSEd
E-Learning

Dele Davies, MD, MS, MHCM
Academic Affairs

April Elker
E-Learning

Maurice Godfrey, PhD
Munroe-Meyer Institute

Scot Ouellette, PhD
College of Medicine

Jaynie Bird, MEd
High School Alliance

Crista Goehring, MSEd
E-Learning

Terri Gulick, MS
High School Alliance

Joseph Rohr, MD, PhD
College of Medicine

Chris Shaffer, PharmD, BCPS
College of Pharmacy

Corey Hopkins, PhD
College of Pharmacy

Geoffrey A. Talmon, MD
College of Medicine

Meg Johnson
NU Foundation

Frank Tworek, PhD
E-Learning

Heidi Kaschke
High School Alliance

Gary Yee, PharmD, FCCP, BCOP
College of Pharmacy

Peggy Moore, MSEd
E-Learning

Dele Davies, MD, MS, MHCM
Academic Affairs

April Elker
E-Learning

Maurice Godfrey, PhD
Munroe-Meyer Institute

Scot Ouellette, PhD
College of Medicine
**GRADES 11 – 12: PHARMACOLOGY**

**Individualized Drug Therapy**

**PROJECT DEVELOPERS**
- David Bahowasi  
  UNO Student  
  2-Time Participant
- Yan Fei Wong  
  UNO Student

**PROJECT SUMMARY**

Getting the dosage right can be a matter of life and death. This module focuses on factors that influence drug concentrations and types of drug interactions and incompatibilities. It also describes different applications of pharmacogenomics and explains the basis of therapeutic drug monitoring.

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**GRADES 6 – 8: PHARMACOLOGY**

**Structure & Properties of Matter**

**PROJECT DEVELOPERS**
- Evan Claxton  
  UNO Student  
  2-Time Participant
- Aaron Hoff  
  UNO Student

**PROJECT SUMMARY**

How do you distinguish between the physical and chemical properties of pure substances? The module describes the relative positions of particles within solids, liquids, and gases. It also explains how variations in temperature or pressure can cause states of matter to change.

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**GRADES 11 – 12: PATHOLOGY & MICROBIOLOGY**

**Mycology**

**PROJECT DEVELOPERS**
- Ailynne Gallegos-Alvarado  
  UNO Student
- Alejandra Solis-Rejas  
  UNO Student
- Siara Ramos-Martinez  
  UNO Student

**PROJECT SUMMARY**

Mushrooms, molds, and yeasts have a much bigger role in the world than you think. This module defines mycology and describes the role of fungi in decomposition. It also lists human diseases caused by fungi.

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**GRADES 11 – 12: PATHOLOGY & MICROBIOLOGY**

**Bacterial Culture**

**PROJECT DEVELOPERS**
- Eduardo Mendoza-Lopez  
  UNO Student
- Efren Mendoza-Lopez  
  UNO Student

**PROJECT SUMMARY**

There are various ways to cultivate bacteria in a laboratory. This module explains the wide-ranging methods, identifies techniques for maintaining a pure culture, and outlines safety concerns regarding the culturing of bacteria.

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**GRADES 11 – 12: PHARMACOLOGY**

**Chemical Reactions**

**PROJECT DEVELOPERS**
- Alex Goodman  
  UNO Alumnus  
  High School Alliance Alumnus  
  3-Time Participant
- Noah Yoshida  
  UNO Alumnus  
  High School Alliance Alumnus  
  3-Time Participant

**PROJECT SUMMARY**

Chemical reactions are how new forms of matter are made. This module highlights the anatomy of a reaction and how energy changes through the course of a reaction.

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**GRADES 11 – 12: PATHOLOGY & MICROBIOLOGY**

**History of Medicine/Pathology**

**PROJECT DEVELOPERS**
- Dani Howard  
  UNO Student
- Emily Johnson  
  UNO Student

**PROJECT SUMMARY**

How does Ancient Egyptian medicine play a role in the documentation of diseases? This module takes the learner through a journey of discovery that details specific tools that have contributed to the advancements of medical practices through the centuries.

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**GRADES 11 – 12: PHARMACOLOGY**

**Pharmaceutical Compounding**

**PROJECT DEVELOPERS**
- Kess Marie Packey  
  UNO Student
- Alexander Wu  
  UNO Student

**PROJECT SUMMARY**

This module discusses what pharmaceutical compounding is and how it compares to drug manufacturing. It also identifies the different dosing forms and the key factors that influence the administration of them.
This publication is produced by Interactive E-Learning at the University of Nebraska Medical Center.

Publication Writer and Designer
Megan Blusys

Abstract Collection Coordinator
April Elker

UNMC faculty, students, and staff can access e-learning modules on the E-Gallery at unmc.edu/egallery