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The newest evolution in digital learning



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EZSTUDIO: All-in-one video recording studio

unmc.edu/EZStudio



How to Use a **PHOTOGRAPHIC ACTIVITY SCHEDULE**

Photographic activity schedules have been used to support individuals with disabilities in completing a variety of leisure, self-care and vocational tasks. Though picture-based activity schedules have been classified as an evidence-based practice, more resources are needed to prepare implementers to use activity schedules with this population.

By accessing this module, learners will be instructed on how to prepare an activity schedule, design a learning environment, teach the use of the schedule using prompts and prompt fading, assess mastery through data collection and evaluation, and progress instruction as the individual indicates readiness.

We incorporated a combination of didactic training, instructional videos and active student responding into the module to ensure appropriate and consistent learning. Competency assessments were also incorporated into the module to evaluate learner outcomes. Each content component is presented within real-life example contexts to promote the application in clinically relevant settings. **CLICK HERE** to view module

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APPROACHING FUNCTIONAL COGNITION

Functional cognition, or the cognition needed to perform daily life tasks, is an essential element of occupational therapy practice. However, while functional cognition is within the practice's scope, it was not until 2018 that occupational therapy education standards mandated the inclusion of the topic in entry-level education. Addressing functional cognition can improve outcomes for clients with cognitive impairments. This can be accomplished through a practiced task or strategy training dependent on the client's level of awareness.

The newly developed UNMC Division of Occupational Therapy Education emphasizes training in assessment and intervention of functional cognition to equip learners with the knowledge and skill needed to address this domain of concern in practice. The program currently provides functional cognition education through recorded lectures and textbook readings.

To our knowledge, there are currently no open access e-modules focusing on occupational therapy's role in addressing functional cognition. The purpose of this e-module is to assist learners in understanding four approaches to occupational therapy intervention for cognitive impairment.

The interactive nature of this e-module allows for formative and summative feedback. The module's animated case-based learning assists the learner in translating knowledge into real-life cases. **CLICK HERE** to view module

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Make the Room Stop Spinning: EVALUATION AND TREATMENT OF BPPV

BPPV, or benign paroxysmal positional vertigo, is one of the leading causes of dizziness in adults. This dizziness is a result of the displacement of calcium carbonate crystals (otoconia) within the inner ear, resulting in the feeling of vertigo or the sense of motion when there is no motion — perceived as dizziness. Health care providers, such as physical therapists, physicians, physician assistants and advanced practice nurses, frequently assess and treat this condition, as it is the most common diagnosis for emergency department patients who complain of dizziness.

Due to the complex and abstract nature of the diagnosis and intervention, learners often struggle to understand the pathophysiology and mechanics in which the condition is managed. This is due to the tiny structures embedded deep within the inner ear where they cannot be visualized.

This module allows all learners to walk through foundational knowledge of the vestibular system, including the anatomy, function and pathophysiology of BPPV. The model makes learners aware of common signs, symptoms and different types of BPPV.

The module marries the didactic information of the fundamental concepts of BPPV with interactive visualization to "bring to life" assessment and management techniques. Learners can apply the knowledge they gathered to answer clinical questions and case vignettes, provided throughout the module.

Health care providers from multiple disciplines are able to utilize this module to better their understanding and future management of BPPV for many individuals who feel like their world is spinning.



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Prescription #1



STATINS: Drug Selection and Patient Education

This module was created to supplement pharmacy student education and facilitate learning about statins, their role in therapy and how to educate patients taking statins.

This module goes beyond course material by applying concepts to patient scenarios. Learners can practice assessing a patient for qualifying characteristics, drug-drug interactions and therapeutic efficacy. Learners are also given the opportunity to practice answering common patient questions regarding statins.

This module incorporates both visual and written animations and includes a variety of interactive knowledge checks throughout the module to assess the learner's progression and reinforce meaningful concepts.

This module will be implemented in the Pharmacotherapy 2 (PHPR 674) course to allow students the opportunity to demonstrate understanding of classroom material in applicable patient scenarios. After students participate in this module, they will have a better understanding of when statins are indicated, why a particular statin might be used in certain patients, and how to educate patients starting statin therapy. After successful implementation in the course, data will be collected to ascertain the effectiveness of this module.



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HEMATOPOIESIS AND BLOOD CELLS

While analyzing one of the existing Genetics, Cell Biology & Anatomy modules, we realized that it could be enhanced with additional information on differentiated and functional blood cells. Further, we wanted to add interactivity.

The result is a more in-depth module that provides key information on each type of blood cells and platelets, as well as 2D and/or 3D images of cells with relevant text and audio descriptions. This is intended to promote better retention.

This update does not include information on the process of formation of each type of blood cells from pluripotent hematopoietic stem cells. Instead, it is intended to fill that gap by adding information to help learners understand the process of lymphopoiesis, monopoiesis, erythropoiesis, megakaryocytopoiesis and granulopoiesis.

This e-module is designed as a self-directed, self-paced learning tool with relevant text and audio designed to help learners before and after didactic lectures. There are self-assessment questions for each cell types to aid in learning. This module, combined with lectures, will better prepare students to understand the concept and details that they need to know.



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HEREDITARY PEDIATRIC CANCER: Genetic Counseling and Molecular Testing

Hereditary pediatric cancer is rare with few opportunities for genetic counseling learners to encounter limited cases in their clinical training and internships. Didactic content on principles of hereditary pediatric cancer syndromes is available through course curriculum; however, traditional lecture format focuses on subject matter and can often lack opportunities for learners to apply knowledge for rare pediatric cancer cases.

This e-learning module was developed to provide an engaging opportunity, using simulated cases, for learners to analyze unique pediatric cancer clinical scenarios.

Using an interactive Candy World board game, competency-based assessments focus on differential diagnosis, molecular testing indications, inheritance patterns and family variant cascade testing. Genetic counselor learners have the opportunity to apply their knowledge, critical thinking and decision-making skills to better understand concepts of rare pediatric cancer genetic cases.

This immersive learning experience is designed to implement genetic counseling concepts in conjunction with the Clinical Cancer Genetics curriculum through motivation, timely feedback and challenging clinical scenarios. While didactic lectures remain an efficient way to disseminate pediatric cancer genetic content to learners, increasing engagement while increasing learner knowledge and experience ensures proficiency with cases they may not have the opportunity to otherwise encounter.



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Shutter Speed

- . The length of time (seconds) the shutter remains open as the picture is taken
- · It affects the sharpness of the image

Try it out by dragging the slider below



Beginner's Guide to CLINICAL DENTAL PHOTOGRAPHY

In dentistry, intra- and extra-oral images are used to better visualize a patient's dentition, for diagnosis and treatment planning, enhancement of patient education and laboratory communication, self-education, insurance verification and specialist referrals. Thus, dental photography is an essential part of dentistry, and students must be educated on this topic to feel more competent in the clinic.

Comprehensive clinical care courses introduce students to clinical dentistry. In these courses, students get to interact with patients, diagnose and treat their dental conditions. It is in the clinic where students get their first hands-on experience with dental photography.

This e-module is a perfect resource for students. It serves as an adjunct to the clinic care courses to cultivate critical skills necessary for the application of dental photography into patient care. This interactive e-module teaches students how to take high-quality dental photographs; it familiarizes students with the equipment and demonstrates step-by-step instructions.

Animations, pictures and videos complement the guidelines. While the e-module will be offered to students to learn the process of taking high-quality dental photographs, the clinical courses will help solidify this knowledge and provide hands-on experience in this area.

In the end, this is going to help students become better-prepared health care professionals.



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What is AUD?





ALCOHOL USE DISORDER: Addressing the Elephant in the Room

Causing 88,000 deaths and costing over \$250 billion annually, alcohol use disorder is the leading cause of liver transplantation. Despite this, alcohol use disorder is undertreated. There are multiple reasons for undertreatment, including patients not seeking care and providers' lack of comfort in screening for and treating the disorder, as it is not included in medical school curricula.

To address this deficit in medical education, we formulated a concise e-module to reinforce in-classroom teaching through animations and patient scenarios. The e-module was developed in conjunction with faculty in the Departments of Internal Medicine, Psychiatry and Gastroenterology/Hepatology. It will be given as pre-reading or supplemental education prior to the dedicated lecture on alcohol-associated liver disease in the GI block of the medical school curricula.

The e-module is divided into two sections using a patient-case scenario to illustrate key teaching points and address the learning objectives of the module. The two sections are:

- Epidemiologic/societal impact of alcohol use disorder and screening for it in clinical practice
- Treatment options for alcohol use disorder

Our goal is to assess the module's success by evaluating the learner's competency in treating alcohol use disorder before and after the scheduled curriculum. Ultimately, through interactive and concise e-learning content, we augment modern learning with supplemental and in-class learning. **CLICK HERE** to view module

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INNOVATORS IN EDUCATION 2023 | 11

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Introduction to TCGA



BIOINFORMATICS OF GENE EXPRESSION REPOSITORIES

Gene expression repositories provide a wealth of data that can be harnessed to advance research and make breakthroughs in understanding disease. Therefore, learning how to perform bioinformatics analysis of online gene expression data sets is an important skill set.

The goals of this module are:

- Familiarize users with the analysis of online gene expression repositories
- · Apply the knowledge of the data analysis pipeline to recognize important parameters
- · Create customized workflows for genes of interest

Students learn about The Cancer Genome Atlas, the largest cancer expression database, perform a basic workflow for data mining, review and interpret results of that workflow, and perform activities to review comprehension of the material.

This module includes an interactive pipeline that walks students through an example analysis. Students complete this module prior to class, followed by an assignment to apply this workflow to a selected set of genes. Class time will use peer review of the results and expand on the pipeline and interpretation of the data.

The module will be assessed by the follow-up assignment, which tests the student's ability to perform the requested workflow. By integrating this module with a follow-up assignment and classroom activities, students will gain the skill sets necessary to broaden their research and gain novel insights from online gene expression repositories.



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Sodium Reabsorption in the Distal Convoluted Tubule



DIURETICS

Renal physiology and the action of diuretic drugs is a highly complicated topic. This module covers renal physiology, diuretic mechanisms, clinic indications for diuretic use and side effects of diuretic drugs. It specifically covers loop diuretics, thiazide diuretics and potassium sparing diuretics.

This module simplifies renal pharmacology with the use of animation. It also uses an interactive table to reinforce understanding of the electrolyte changes that occur with diuretic use. There is an abundance of practice questions throughout the module. There is also a 10-question final assessment at the end.

The module's interactivity and animation give students a beneficial change of pace from lectures and reading-based material. The module offers a high level of flexibility, so students can focus only on concepts that they do not fully understand.

The e-module fully explains concepts and can be used independently, if desired. However, it is best used to supplement a renal or cardiovascular curriculum. Although intended originally for use within a medical school curriculum, the module would fit well within a curriculum for pharmacology students, physician assistant students and nurse practitioner students.



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Stitching It Up: A MEDICAL STUDENT'S GUIDE TO SUTURING

This e-module is designed to augment the general surgery clerkships for third- and fourth-year medical students while on surgical rotations.

The module walks students through the three most common surgical suturing techniques used for closing lacerations and surgical incisions in a step-by-step fashion. It allows them to follow along with the video to complete each of the suturing tasks while the video plays and highlights some common tips and tricks students can use to help improve their technique.

This module will be implemented in the surgical clerkship during the students' suturing and knot-tying simulation, but by making it available online, the students can access the content anytime to continue practicing honing their skills.

The assessments are built to help the students break down each task into individual steps for each technique, requiring them to think through the procedure even when not actively performing it. By utilizing best practices for e-module design, this project will help learners master suturing skills, which is a core objective for medical students to complete prior to graduation.



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CODEPENDENCY AND FAMILY DYNAMICS

The Substance Use Disorders and Recovery Course (PHPR 621) used an outdated, poor-quality video to demonstrate the various codependent roles assumed by family members affected by substance use disorders. This updated e-module uses graphical representation for the "characters" in two relatable scenarios and adds an interactive platform to engage students in the material and assess understanding.

This module aims to promote retention and application of the material by mixing instructional content, animation and demonstration, and active learning tools. The student is introduced to the topic of codependency and views scripted scenarios depicting codependent family roles. The scripted scenarios are integrated with content slides and interactive questions relating the content to the scenarios. Students learn by listening, viewing and applying. In the classroom, students will integrate the material with discussion on how codependency can impact health and well-being, strategies for

overcoming codependence and community resources for referral.

The module uses a variety of interactive self-assessment strategies, including multiple-choice questions, drop-and-drag matching, and selecting the best option. The instructor will use these assessments to gauge student knowledge and need for additional instruction.

Addressing substance use disorders and family dysfunction is often a sensitive topic. This module helps students understand why substance use disorders are considered a "family disease" and that family members often struggle with appropriate relationship boundaries. Understanding the feelings and behavior patterns of codependent family members better prepares health care professionals to have meaningful conversations with patients and family members about the impact of substance use disorders.

CLICK HERE to view module

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A JOURNEY OF E-LEARNING SCHOLARSHIP: Beginning with the End in Mind



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Lauren Wegner, MS College of Medicine Class of 2024 Perioperative medicine is not a conventional component of US medical school or residency curricula. As a potential solution to fill this training gap, we created a peer-reviewed e-module designed for trainees undergoing clinical experiences in the perioperative setting.

The e-module was offered as an elective, self-directed learning experience across three institutions. Trainees were asked to complete 4.5 hours of module content before the end of their month-long clinical rotation.

To maximize engagement, we presented evidence-based teaching pearls in a case-based manner. Each of the six learning objectives included an interactive, multimedia didactic followed by multiplechoice questions. A pre- and post-test were offered for summative assessment of trainees who consented to the study. Results were downloaded in Canvas after three years of recruitment.

IMPACT & REACH

500+

The module has been used **500+ times in Canvas** since being deployed as part of our e-learning study in 2018.



test, perioperative care knowledge improved from pre-test to post-test by an average of 30%. Confidence ratings in perioperative care improved from an average of 4/10 to 7/10 after completion of the module. Results were statistically significant across sub-groups of medical students, interns and residents for both knowledge acquisition and confidence.

1 2 3 4 5

Over the past 4.5 years, **170 trainees** have used the module on UNMC's Pre-op Anesthesia Clinic and Surgical Co-Management service, despite a 12-month period of delayed recruitment.

≫75%

Greater than 75% of trainees either agreed or strongly agreed that the time to complete the module was acceptable and that the material was **concise**, **easy to understand and relevant** to future practice.

PUBLICATION JOURNEY

As novices in e-learning, educational research design and dissemination of medical education scholarship, we found this experience to be invaluable in learning new skill sets that are applicable as clinician educators. Whether curricular design, multimedia learning theory or research methods, e-learning scholarship is a fun way to level up your game.

Aside from the joy of content creation and research, there are some challenges when disseminating e-learning scholarly activity. Updating content as evidence-based guidelines change may not be sustainable unless you have a team that is fully invested in the project. We would not have been successful without recruiting UNMC E-Learning lab specialists, Canvas support specialists and Educational PhD consultants.

Beginning with the end in mind requires first defining the educational gap before pursuing the innovative solution. The next step is identifying who will serve as the content, creative, curriculum and research methods experts. Very few clinician educators have all these skill sets, so you may need multiple consultants along the way. It is better to identify them sooner than later.

A publication about our e-learning experience is currently under review with MedEd Portal.

MODULE INFORMATION

TITLE

Perioperative Evaluation: A Clinician's Guide to Evidence-Based Care

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



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