CourseSource
Evidence-based teaching resources for undergraduate biology education
www.coursesource.org

Inspiring Evidence-Based Teaching Innovations with the Journal *CourseSource*

The journal *CourseSource* was created in response to a recommendation in the *Vision and Change in Undergraduate Biology Education* report. This report recommended the development of a well-organized repository of evidence-based teaching resources for undergraduate biology education.

Changes in the way colleges and universities are approaching their undergraduate STEM courses can be observed nationwide. One stumbling block is the time and energy commitment needed to produce evidence-based active-learning materials. To answer this need, *CourseSource* was created.

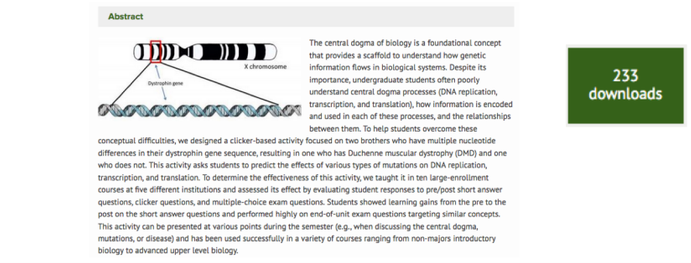
CourseSource is an **open-access, online journal of peer-reviewed** undergraduate biological teaching materials that:

- Incorporates evidence-based, active-learning pedagogies
- Is organized and formatted so that lessons can be transferred and used in other classrooms

Lesson Articles are aligned with learning objectives and goals developed by professional societies

ASBMB American Society for Biochemistry and Molecular Biology · Botanical Society of America · esa Ecological Society of America · Society for Developmental Biology · ascb the american society for cell biology · GSA Genetics Society of America · American Society of Plant Biologists · American Society for Microbiology

Example of a *CourseSource* Lesson that focuses on common student conceptual difficulties and highlights a collaboration between instructors at multiple institutions


OPEN ACCESS Freely available online — CourseSource Lesson

A clicker-based case study that untangles student thinking about the processes in the central dogma

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Abstract

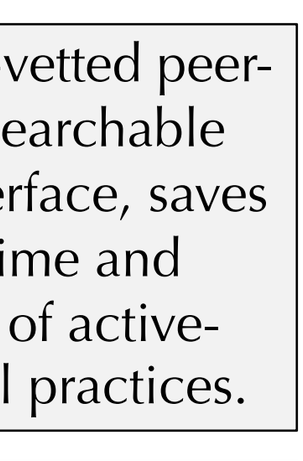
The central dogma of biology is a foundational concept that provides a scaffold to understand how genetic information flows in biological systems. Despite its importance, undergraduate students often poorly understand central dogma processes (DNA replication, transcription, and translation), how information is encoded and used in each of these processes, and the relationships between them. To help students overcome these conceptual difficulties, we designed a clicker-based activity focused on two brothers who have multiple nucleotide differences in their dystrophin gene sequence, resulting in one who has Duchenne muscular dystrophy (DMD) and one who does not. This activity asks students to predict the effects of various types of mutations on DNA replication, transcription, and translation. To determine the effectiveness of this activity, we taught it in ten large-enrollment courses at five different institutions and assessed its effect by evaluating student responses to pre/post short answer questions, clicker questions, and multiple-choice exam questions. Students showed learning gains from the pre to the post on the short answer questions and performed highly on end-of-unit exam questions targeting similar concepts. This activity can be presented at various points during the semester (e.g., when discussing the central dogma, mutations, or disease) and has been used successfully in a variety of courses ranging from non-majors introductory biology to advanced upper level biology.

233 downloads

CourseSource is a journal of scholarly teaching, not a journal of biology education research

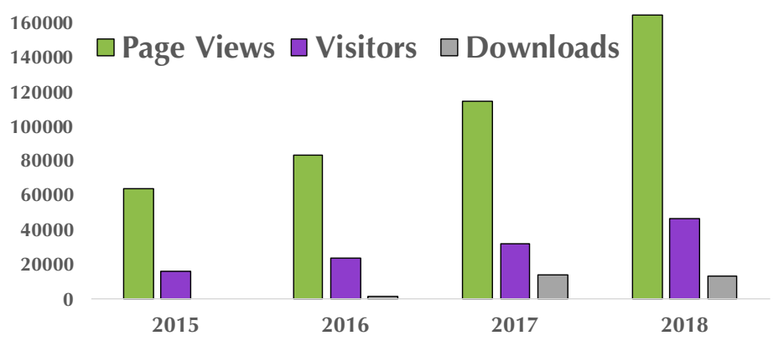
Lesson Articles:

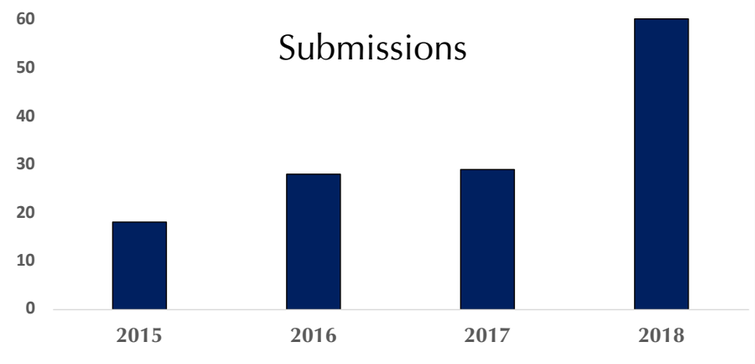
- Are organized into courses
- Describe innovative classroom or laboratory activities
- Contain all of the information and resources needed to replicate or adapt the lesson for use in another course
- Must be 'field-tested'
- Have a writing style is often more similar to a methods paper than a research article
- Include rich metadata to support effective searching for materials to serve specific needs



Creating a set of well-vetted peer-reviewed Lessons, searchable through a journal interface, saves other instructors time and encourages the use of active-learning instructional practices.

Interest in *CourseSource* articles is increasing



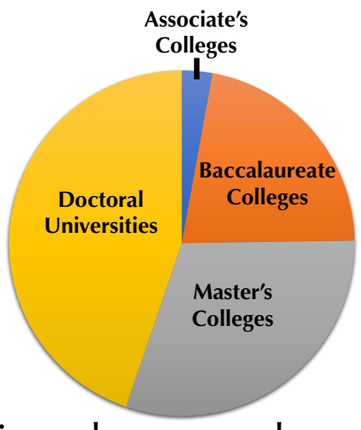


Benefits to publishing in *CourseSource*

For authors, *CourseSource* publications:

- Provide evidence of excellence in teaching that can enhance a C.V.
- Give graduate students, postdocs, faculty etc. highly sought after pedagogical training
- Promote new collaborations focused on teaching
- Send a powerful message to prospective students and their families about the value an institution puts on teaching and learning

CourseSource authors work at a variety of institution types.



Developing classroom lessons results in important intellectual contributions that are an indication of a commitment to using evidence-based, active-learning teaching techniques. ***CourseSource* publications help departments highlight teaching accomplishments using similar metrics to research achievements** to show how instructors are improving their own teaching and sharing their innovations with a broader audience.

CourseSource is actively seeking Lesson Articles and Editors

Editors serve as coaches in the publication process

Visit www.coursesource.org

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The website includes article templates and short videos to assist you in getting started.
We are happy to help and look forward to publishing your teaching innovations.

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National Science Foundation grant DUE 1725130