CELT 2023 TEACHING BRIEF

Building Student Engagement in a Condensed Spring Course

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INTRODUCTION

B M S/A ECL 401, **Introduction to Aquatic Animal Medicine**, is a unique course, being one of the only electives available to Iowa State students to help them get acquainted with aquatic animal diseases. Focusing on fin fish production, health, and medicine, students taking the class range from senior undergraduates in Animal Ecology (Natural Resource & Environmental Management) or Animal Science to graduate students in the Biomedical Sciences One-Year Non-thesis Masters program. The majority are veterinary students with an interest in exotic animals.

As an 8-week introductory course, BMS 401 attempts to introduce up to 30 students each spring to a wide range of topics in a relatively short period of time. Enrollment is limited by the van capacity & visitor limit for the two course field trips. Notably, the "wait-list" each year often exceeds the class's limited enrollment.

Course topics covered in BMS 401 include:

- What water quality parameters are measured for fish health
- How anatomy and physiology are unique to the aquatic existence
- Which diseases are most common and how biosecurity can be used to prevent
- Which drugs can be used in fish and how they are regulated for use

Since its inception in 1998, **Introduction to Aquatic Animal Medicine** has covered several topic areas. The topics have been variable depending on the availability of instructors with specific areas of expertise, but the class is always limited in scope and depth due to its half-semester course schedule. There are many more introductory-level topics that could be added to the course.

In creating an open educational resource (OER) for my course, I wanted to address the current limitations by creating a textbook that contained chapters on all relevant topics for an introductory aquatic animal medicine course. The new course materials would be more aligned with student interests and provide them with more opportunities to reflect on the topics we covered in the course. Additionally, the publication has potential use by other veterinary colleges that do not have classes in aquatic animal medicine as well as by private veterinary practitioners.

INCEPTION

In 2021, I began developing a multi-topic course textbook by incorporating lecture notes, references, and best practices which I had developed over years of teaching B M S 401. This project was started for several reasons including the following:

1. The condensed length of B M S 401 leaves little time to delve into its content deeply.
2. In my extensive experience teaching B M S 401, I noted a growing interest among students in learning more topics including immunology, reproduction, larval fish rearing, surgery, anesthesia, and other areas not covered in the course's curriculum at the time.
3. Pulling together past lectures and resources into a single resource could showcase the applicability of the course's content and the inter-connections between topics.

This project was funded by the Miller Open Education Mini-Grant Program, which allowed me to hire a copy editor for the final work.

THE PROJECT

Although my initial idea was to develop a textbook for students, I learned during my first semester developing the OER that the best way to effectively engage my students in interacting with the content was by inviting them to critically evaluate it. Abbey Elder, the Open Access & Scholarly Communication Librarian at Iowa State, worked with me to develop an open pedagogy project for my course, where students would be asked to review my draft OER as part of their coursework. I implemented this approach in B M S 401 in 2022 and continue to work with my students on improving, reviewing, and collaboratively developing new chapters to this day.

HOW IT WORKED

The first, third, and fifth lectures in the class were followed by giving students a draft of the textbook chapter for the corresponding lecture topic. A complete chapter review was done in two week segments. The first week's assignment was for all students to read the entire draft and focus on an area that most interested them as individuals. The draft was evaluated for level of content, accuracy, factual support, and organization. The second week involved a student panel (approx. 8 students) who collectively edited and consolidated all the comments into a "final revision" format. This activity helped these students build experience locating peer-reviewed sources and summarizing research, as they added citations to verify the content that I had developed from experience working in the field. This collaborative process helped solidify the ties to practice which I aimed to help students achieve in this course, while also improving upon the content that would be available to students in future semesters.

Since this project was unique and new to both me and the students, I did not want to grade students on the quality of their edits. Instead, to assess the outcomes of the project, students were asked to reflect on their experience through self-assessment surveys. Every student completed a survey assessing their experiences of commenting on the draft chapter content, and each panel member submitted a combined assessment of the collective effort of the panel. During the last week of the course, students were asked to individually submit a summary evaluation of their progress and successes, and how they would grade themselves.

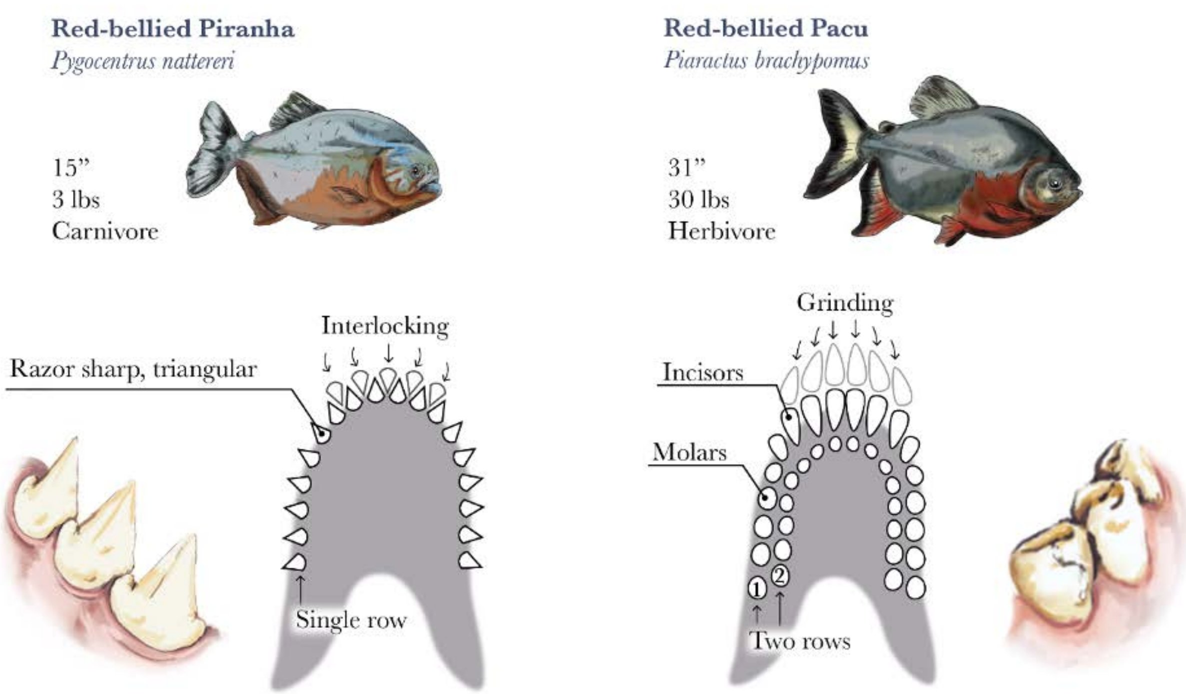
After the student panel completed their work on the draft chapter, I asked for their permission to include their names on the chapters they worked on as contributors, added those who agreed, and made final edits to the chapter for publication. The chapter was then sent to experts in the field for peer review, who provided useful feedback on the textbook's structure and content. After I completed a final round of edits based on the peer reviewers' feedback and a round of copy editing, the textbook chapters were individually uploaded to the course Pressbook. The first edition of the book will be officially published in 2024.

OUTCOMES

The changes made to B M S 401 have been helpful in addressing my concerns about the breadth and depth of the content the course can cover. These changes were achieved by allowing students to delve into topics of interest through editing book chapters for the new OER, while still receiving the same general overview from lectures which past students had received.

In fact, some students explored their topics in even more depth, continuing to support their chapter projects after graduation or contributing alternate resources to the course, such as infographics or diagrams (Figure 1). This indicates that students were interested in continuing to contribute back to the course and engage in the content even after graduation.

In addition to contributing to the development of the OER, the students also got a lot out of the self-assessment process in the course. Reviewing their own work was not easy for every student, and some even came to me concerned about whether they could give themselves a good grade and be fair; however, after the first couple of weeks of self-review, the students in my class found confidence in their work. In fact, when asked, students overwhelmingly preferred the chapter review and self-review assignment over the typical exams which had previously been assigned.



KEY TAKEAWAYS

After making these changes to my course over the past two years, I have learned a few things about how to manage a project like this, and how others can do the same. I have learned to:

- Instill confidence in the students by encouraging them to use their thinking and expertise. Often, as college graduates or advanced students, they have never had this freedom before.
- Be prepared to review and manage several hundred comments on each draft, and provide constructive feedback in replies. Some students take reviewing very seriously!
- Have some idea of the endgame of the chapter content. Make notes in the draft before students review if specific content is covered in another chapter and should not be considered "missing" (e.g., infectious disease covers microbes and parasites, but since parasites is so broad, that is covered in another chapter).
- This approach enhances quality time with students. There are more questions, discussions, and interactions. However, this takes more time than quizzes, exams, and other more traditional student evaluation methods.

IMPLICATIONS

There are a few things to keep in mind for a course implementing a project like this. First, I would recommend thirty students as the upper limit of class enrollment when considering the scale of student comments to filter through. Second, this instructional design may be better suited to classes that have practical applications. Finally, the class seems to work better for students that have some knowledge or experience in the class content, i.e., biology for BMS 401. While the textbook presently focuses on finfish because of the focus of BMS-401, there is absolutely no limitation that would prevent other topics from being included in a project of this type in the future. The chapters can be introductory or foundational chapters before moving on to more advanced and detailed content in other courses or contexts, and because they are openly available, the textbook can be used in contexts beyond ISU such as for employee training of new research personnel working with aquatic animals.

Link to Topics in Aquatic Animal Health (https://iastate.pressbooks.pub/aquaticanimalhealth)