



Evolution of a Human Biology Course

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Introduction

Over the past four years, a course in Human Biology has evolved from a traditional, face-to-face course, to a completely online course, to a hybrid course. As a result of the redesigns, course materials have become more consistent and detailed, greater emphasis has been placed on integrating the various components, and more effective strategies have been used to engage the students. In addition, the instructor has greater awareness of what aspects of each redesign has been most effective, and has been able to make improvements based on his experience in teaching the same course in the different environments.

Background

Human Biology, is a large enrollment (approximately 750 students per semester), general education course. The course attracts students who are non-science majors, typically in their first-year, and have earned average or below-average grades in high school science. As a result, the challenge for the instructor is to motivate the students to learn about complex biological concepts even though many of them may have preconceived notions of their abilities and the degree of effort that will be required to complete the course.

Course Content

The most important aspects of teaching Human Biology included keeping things simple, easy to understand, and most importantly, interesting. Intertwining the diagnosis, treatment and prognosis of diseases with the structure and function of organ systems made the content relevant to the "real world." With the large number of students in Human Biology, many had a friend or relative who was struggling with a disease, resulting in the course having a more personal impact. In fact, one of the broader objectives of the class was to provide the students with the background necessary to research and understand a specific condition or disease.

Face-to-Face Setting

Human Biology was taught for approximately 10 years in a traditional lecture setting. Several hundred students attended class in a large lecture hall and passively listened to the faculty member present the course material. Since Human Anatomy and Physiology are topics that require visualization to be understood even in simple terms, overheads from publishers were initially used to show body structures to the students.

Eventually lectures began to incorporate more computer-based technologies. First was the introduction of commercially produced multimedia into lecture, and then note outlines were placed on the instructor's personal web space. Eventually more complete notes were developed as well as the inclusion of actual artwork scanned by hand from textbooks.

Online Course

In 2003, as a result of a special initiative, several large enrollment general education courses, including Human Biology, were identified for the purpose of creating online courses. Each course was assigned a team, which included an instructional designer and multimedia developer, who worked closely with the instructor, who served as the subject matter expert.

The Human Biology course was redesigned to increase interaction between the student and the content, and also the interaction between the student and his/her classmates. To accomplish this, self-scoring, online quizzes were developed for each lesson; students were asked to identify muddiest points each week (which were clarified by the instructor in an email each week); and four group activities were added. In addition, the online notes were expanded to create online lessons, and complex animations were created to help the students with difficult concepts and processes. Permission was obtained from the publisher for continued use of static images.

After a year of development the online materials were piloted with 50 students in Spring 2004. The assessment of the pilot revealed that there were no significant differences in learning outcomes between the online course and the traditional lecture setting. Following a few revisions, the course was opened up to 300 students in the Fall 2004. Eventually other sections were offered at a distance to students at other Penn State campuses throughout the state of Pennsylvania. Up to 35 students at four different locations completed the course in one semester in addition to the 300 students at the main campus.

Blended Learning

In 2005, as a result of a second initiative, Human Biology was redesigned again for a hybrid or blended format, which integrates face-based instruction and computer-based instruction (Marsh, McFadden & Price, 2003). The goal of this initiative was to create a

modularized course with learning objects that could be used by many different instructors, according to their needs.

A major part of this project was creating original content to avoid copyright issues. All static images were recreated and several more animations were added. In addition, the online group activities, which appeared to be a weakness in the online course, were redesigned for the face-to-face meetings. The purpose of having the students meet with their assigned groups in class included 1) building a sense of community, and 2) increasing accountability (Aycock, 2002). The group activities required students to do online prep work prior to meeting, and online follow-up work after the meeting. This served to integrate the face-to-face work with the online work, and to motivate the students to come to the face-to-face meetings (Sands, 2002).

In addition to increasing interaction between the student and the content and the student and his/her classmates, the hybrid version of Human Biology increased student interaction with the instructor. By meeting the instructor in person and having some interaction with him during the three face-to-face meetings, the students' comfort level increased in terms of asking questions and sending emails. According to Martyn (2003), the quality of the students' interaction with the instructor in an online environment impacts their overall satisfaction with the course more so than in a traditional face-to-face environment.

Differences Between Traditional, Online and Hybrid Course Format

After teaching the course for many years in a traditional lecture setting, then teaching the same course for several years online and finally as a hybrid, a number of interesting differences have been noted.

Student Interaction With Course Materials

Instead of being a passive learner in a large lecture hall, students in the online and hybrid versions of Human Biology are active learners, taking the initiative to read, interact with and seek help in understanding the course content. The lesson content has improved greatly through the course redesigns, with the most current, original images and animations being the highest quality because they emphasize the learning objectives of this particular course (as opposed to those of a text book). Students in both the online and hybrid courses are able to review the lesson content as many times as needed to understand it, and they also may clarify concepts through contact with the instructor. The online students must rely solely on email; however, the hybrid students have the additional option of approaching the instructor following a face-to-face meeting.

Students in the online and hybrid versions of the course also have the advantage of reflecting on course content and receiving immediate feedback via the online quizzes that follow each lesson. Students may take each quiz two times to obtain a passing score, which earns them points toward their grade. Such low-stakes quizzes let the

students know if they learned the material for the week thoroughly enough to continue or if they needed to review more.

Student Interaction With Each Other

Students also worked together asynchronously on group projects. Such projects helped reinforce the concepts covered in the class as well as allowed the students the opportunity to explore topics of interest to them. These personally-relevant topics (i.e., a disease that a family member or friend has been recently diagnosed, effects of drug and alcohol, etc.) provide motivation to the students as well as encouraged them to make connections to the course content. Group activities were not used in the traditional classroom due to the large enrollments, lack of space and increased workload for the instructor. In the online and hybrid courses, group activities were easily incorporated using the discussion forums in the course management system that document and track student participation.

Student Interaction With Instructor

In the traditional classroom, interactions with the instructor were limited to “question and answer” in class and during scheduled office hours. Similarly, in the online course, interactions initially were limited to either email correspondence or a class announcements posted by the instructor. Over time, as his skills in managing an online class improved, the instructor was able to take advantage of “teachable moments” in message board discussions; however, these were lost if students failed to check back on their initial postings.

One serious drawback of working online is the perceived lack of the instructor’s presence in the virtual classroom. Students do not have the opportunity to elaborate on or discuss issues with the instructor in front of the other students. The students are left to their own devices, with little minimal guidance as to how to interpret the material. Only the student requesting help receives attention from the instructor. The majority of the students in an online course, however, fail to seek out this assistance. These students may refrain from contacting the instructor because he seems distant or unapproachable.

In the hybrid course, the interactions between the students and the instructor are more varied and of higher quality than in the online course. Meeting the instructor at the “Kick off” Meeting during the first week and during the subsequent face-to-face sessions appears to increase the students’ comfort level with the instructor. The students no longer viewed the instructor as the mysterious “wizard behind the curtain,” but rather, a real human being who is available to help guide them through the course (i.e., “guide on the side.”) This familiarity with the instructor increases the likelihood that students will communicate their needs during after-class conversations and email. The students are also less likely to misinterpret the tone of the instructors’ emails, and to respond in an appropriate manner.

Conclusions

As a group, the students in traditional and online forms of the class have shown no significant differences in learning outcomes. Performance in the hybrid version has been similar.

According to the end-of-semester evaluations of the online and hybrid versions of the Human Biology course, students' perceptions of whether the course was easy or difficult was similarly distributed in both formats; however, in the hybrid format, the students were more likely to indicate that they found the class interesting or that the instructor tried to be helpful.

In a separate evaluation of all the hybrid courses (funded by the same initiative as Human Biology), the Schreyer Institute for Teaching Excellence found that the majority of students enrolled in a hybrid course claimed that the reduced classroom meeting time helped them achieve the objectives of the course because they could learn the material without having to attend lecture, teach themselves, manage time more effectively, and increase the amount of study time. Some students, however, reported that the reduced meeting times did not help them achieve the objectives of the course and felt that they would have learned the material better in a face-to-face format.

In addition, more than half of the students indicated that the face-to-face class periods enhanced their online interactions and vice-versa, the quality of the in-class and online interactions was high throughout the course, student-instructor interaction and student-student interaction was facilitated in a variety of ways, and the format of the course facilitated more student-student interaction than face-to-face courses.

References

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