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An Undergraduate Taught Course on Consciousness and Mind

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Consciousness remains a mystery despite centuries of inquiry, but neuroscience research is beginning to offer insights into the conscious brain. Although the influence of neuroscience in decoding consciousness is growing, it is distinctly absent from collegiate education. Many psychology and neuroscience textbooks devote a single paragraph or an appendix to consciousness. Simultaneously absent from undergraduate education are opportunities for students to practice teaching skills. Our course, Consciousness and Mind (PSYC 499), was designed to address these inadequacies. The course was designed and taught by an undergraduate student at Ohio Wesleyan University and supervised by the Director of the Neuroscience program. The class met once a week for a three hour block period, which required active engagement to keep students interested and motivated. Several novel class activities were designed to hold student attention and offer a checkpoint for the student-instructor to assess the strength of the preceding lecture. These activities included varied group discussions, an animal-mind debate, a movie screening, and a final presentation. The course received positive feedback from all who participated. Although the once-a-week class period offered a manageable workload for the student-instructor, more frequent meetings would have strengthened the interaction with the material. With preparation, motivated students, and frequent feedback from a seasoned professional, a student-instructed course can be a rewarding experience for all involved.

Key words: consciousness; mind; undergraduate instructor

Consciousness has been described as the last remaining mystery. Despite centuries of thought, research, and debate, humanity has yet to offer an agreeable theory of consciousness. Indeed, we struggle to begin to specify how to think about the conscious mind. Historically, philosophers have dominated discourse on consciousness. Consciousness became a dirty word under the Behaviorist influence in the middle and late 20th century. Meanwhile, neuroscience introduced the complexity and intricacy of the brain, with its nearly 100 billion neurons and one quadrillion connections among those cells. Out of the brain revolution has sprouted dozens of theories attributing consciousness to neural sources. However, neuroscientists often seem hesitant and skeptical about the study of the mind in the lab.

The impact of this impression about neuroscience and consciousness has extended beyond the laboratory and in publications. Collegiate education has also been influenced: courses on consciousness are limited, and many psychology and neuroscience textbooks under-represent the importance of consciousness, devoting a footnote or concluding paragraph to briefly mention that there is little agreement on the topic.

Students reading such paragraphs may become interested in learning more about the subject. Yet, a rigorous study of consciousness is often unavailable, except through independent studies or readings. At Ohio Wesleyan University (OWU) a wish for academic study of the mind became apparent with little opportunity to pursue this investigation. In light of this interest, the student instructor decided to develop a seminar course titled Consciousness and Mind (PSYC 499).

Aside from class presentations or informal student lectures, undergraduates studying neuroscience have few opportunities to practice teaching skills. For students who aspire to become a professor of neuroscience or who may pursue a doctorate where they will be asked to be a teaching assistant (TA), classroom teaching experience as an undergraduate can offer vital practice that will determine early success in teaching roles.

We believed this course on consciousness could be taught rigorously from a psychology and neuroscience perspective (rather than a more traditional philosophy perspective) and offer an exceptional learning opportunity for an undergraduate who aspires to become a professor.

COURSE PREPARATION

The preparation for the academic aspects of the course occurred in four phases: (1) content research, (2) establishing the course objectives, (3) syllabus development, (4) lecture preparation, and (5) activity and assignment development and distribution. The undergraduate instructor, who received regular feedback from the faculty advisor, completed the majority of the preparation for the course.

Content research included reviewing primary and secondary source documents to understand the range of topics available for the course. Several textbooks on consciousness were purchased to offer direction (e.g., *Cognition, Brain, and Consciousness: Introduction to Cognitive Neuroscience* (2nd Edition by Bernard J. Baars, 2010). Upon reviewing these options, the textbook *Consciousness: An Introduction* (2nd Edition) by Susan Blackmore (2011) was chosen as the primary course text for its broad and rigorous overview of consciousness as examined by neuroscientists, psychologists, and philosophers. Prior to developing the syllabus, we

developed a concise objective that would offer direction for course planning. We resolved that our primary goal for the students was, "On completing this course, students will be able to describe in his/her own words major theories of consciousness and understand the implications of these theories."

Lecture preparation followed in the summer of 2011, which integrated material from the *Consciousness* text and other texts, including *The Origin of Consciousness in the Breakdown of the Bicameral Mind* (1990) by Julian Jaynes, *Consciousness Explained* (1991) by Daniel Dennett, and *The Quest for Consciousness: A Neurobiological Approach* (2004) by Christof Koch and Francis Crick. Finally, activities and assignments, including weekly readings, were built around each course theme to prepare students for lecture, engage students during class, and offer post-lecture interaction with course materials and ideas.

While developing the content of the course, the student instructor learned basic elements of effective instruction via independent readings and conversations with the faculty advisor. In addition, informal discussions were held with a professor of education at OWU on course objective development. The faculty advisor gave feedback on the syllabus, assignment sheets and exams prior to their use in the course. Additionally, during the term, the faculty advisor sat in on each class meeting and took notes regarding the quality of instruction, the interaction with students, and outcomes of course activities. These notes and observations by the student instructor were discussed in post-lecture meetings. Following lectures were adjusted according to these previous considerations. As the semester advanced, the time commitment to these post-lecture discussions was decreased as the student instructor incorporated previous feedback and improved performance. The student instructor felt these meetings were most helpful in sharpening the lectures and improving student interactions.

STUDENT REGISTRATION

Understanding that a fellow undergraduate teaching a collegiate course is very unusual and may be disagreeable for some students, we endeavored to maintain transparency. Accordingly, students were required to receive permission from the instructors prior to enrollment. At this time, interested students were given the details of the course. If a student had felt that a student instructor might impede their success, he or she would have been asked not to enroll. This did not occur during the Fall 2011 course offering.

This registration process doubled as a vetting process to ensure the student's academic background was adequate to appreciate the advanced course material. The student instructor and faculty advisor believed students with a strong background in psychology and/or neuroscience would be most suitable. Correspondingly, several prerequisites where determined based on the courses available at OWU that would prepare students with a sufficient academic background. These courses included: Intro to Psychology (PYSC 110) and one or more of the following courses: Clinical Neuroscience (PSYC 255), Psychopharmacology (PYSC 300.8), Physiological Psychology (PYSC 343), Cognitive Psychology (PYSC 364), and Topics in Neuroscience (PYSC 374). Although the course included philosophic themes, students were not required to have a background in philosophy.

Four students where registered (within an average sized seminar course at OWU). The students were psychology or neuroscience majors, and all upperclassmen. One of the neuroscience majors is also a philosophy minor, but none of the others had a significant background in philosophy. Nevertheless, the students were willing and prepared (through course readings and assignments) to tackle the philosophy discussed in the course, with occasional need for clarification. One of the main purposes of the course was to offer science majors the opportunity to discuss topics, like consciousness, often sequestered to the philosophies.

COURSE FORMAT

The course schedule (Figure 1) was designed to initially provide students with the definitions, theories, research, and thought experiments that provide the basis for most debates on consciousness and mind (e.g., Mary the color scientist, Nagel's bat, dualism versus materialism, the neural correlates of consciousness, the multiple draft model, and the Hard Problem). Two weeks of lecture were devoted to historical and contemporary philosophic debates on consciousness, beginning with René Descartes and ending with contemporary philosophers such as Daniel Dennett. In the following two weeks, we discussed the role of neuroscience and psychological research in affirming, refuting, and bewildering the philosophic theories previously discussed. This section concluded with the course's one examination. The purpose of this exam was to encourage students to consolidate these fundamentals of consciousness.

The latter half of the course challenged students to apply their knowledge and appreciate the implications of theories of consciousness and mind. Controversial debates including the existence of animal minds and the potential for artificial minds were introduced. Public interpretations and misconceptions on consciousness, and theories of self were also included. The students, choosing from remaining chapters in *Consciousness*, determined the final lecture topic: altered states of consciousness and out-of-body experiences.

CLASS MEETINGS

The class met once a week for a two hour and fifty minute period. Class began by addressing inquiries or concerns from previously assigned readings. If a written assignment were due, students had the opportunity to summarize their research and thesis, and describe challenges faced in completing the task. These impromptu discussions provided students practice expressing their ideas and interacting with difficult material.

Following opening discussions was a two-and-a-half hour lecture, broken by a brief break. Prezi, an Internet based alternative to PowerPoint (http://prezi.com), was the primary presentation tool (see Figure 2). The lectures

included class discussions, group activities, and short video clips offering a diverse range of approaches to interact with the material. Questions were welcomed throughout the lecture and several minutes of each class would involve addressing these inquiries.

Course Schedule and Reading

8/24 INTRODUCTION/ COURSE OVERVIEW/ HISTORY/ DEFINITIONS

8/31 MONIST AND DUALIST THEORIES OF CONSCIOUSNESS/ DUALISM
***Reading**:* Chapter 1; Blackmore
Assignment 1

9/7 HARD AND EASY PROBLEMS/ WHAT DOES CONSCIOUSNESS DO?
***Reading**:* Chapters 2 and 3; Blackmore

9/14 CARTESIAN THEATERS AND MULTIPLE DRAFT THEORY
***Reading**:* Chapter 4 and 9; Blackmore

9/21 EXAM 1

9/28 EVOLUTION OF CONSCIOUSNESS
***Reading**:* Chapter 13 and 14 (218-230); Blackmore

10/5 THE BRAIN AND NEURAL CORRELATES OF CONSCIOUSNESS
Reading: Chapter 10 and 12; Blackmore

10/12 Mid-Semester Break, No Class

10/19 ANIMAL MIND DEBATE
***Reading**:* Chapter 15; Blackmore
Animal Mind Debate

10/26 MEMES AND MINDS
***Reading**:* Chapter 14 (230- 233); Blackmore

11/2 ARTIFICIAL CONSCIOUSNESS
***Reading**:* Chapter 16, 17, and 18; Blackmore

11/9 ESSAY PRESENTATIONS/ CONSCIOUSNESS IN THE MEDIA/ MOVIE
Essay 1

11/16 THEORIES OF SELF
***Reading**:* Chapter 7 and 8; Blackmore

11/23 Thanksgiving Break

11/30 BORDERLANDS? ALTERED STATES OF CONSCIOUSNESS? FIRST-PERSON APPROACHES?
***Reading**:* TBA; Blackmore
Assignment 2

12/7: FINAL PROJECT PRESENTATIONS

12/14 FINAL PROJECT PRESENTATIONS
***Assignment 3** (Due before the end of exams)*

Figure 1. Course schedule, fall 2011.

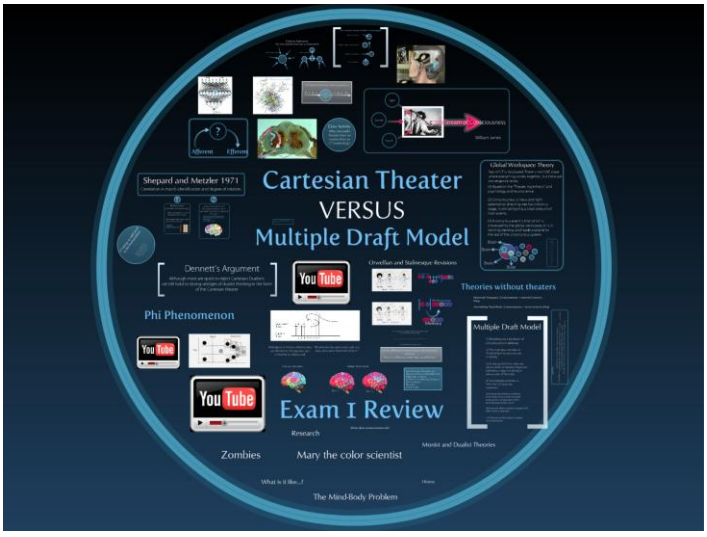

Figure 2. Sample of Prezi presentation used for weekly lecture.

CLASS ACTIVITIES

Questions regarding consciousness and the mind historically spark debate. Correspondingly, we strived for the class to appreciate this characteristic by having the students actively interact with these disagreements, instead of presenting them only in lecture format. Class activities were the primary vehicle by which students explored this arguable material.

Four class activities dominated the term: small group activities, an animal-mind debate, film viewing, and a final presentation. Small group activities included group discussions, analyzing text, and short video clip viewing. The primary goal of these activities was to apply or demonstrate lecture material in an interactive format.

One of the most prominent and contemporary debates regarding consciousness is whether or not animals are conscious. It seemed fitting to have the students engage with this material in the form of a debate as they are most likely to encounter the topic in public. Two weeks prior to the debate, students were randomly divided as either arguing in favor or against animal minds. A chapter in *Consciousness* summarizes the animal mind debate, but students were asked to incorporate external sources in their arguments, including primary sourced documents and research. Students prepared for three main components: argument, rebuttal, and a final statement. A guest was invited to observe the debate and assist in determining the winning team, which added a dynamic quality to the debate. The guest was a familiar staff member of OWU, who expressed interest in the topic, yet seemed open-minded to both positions. The addition of this visitor seemed to transform the debate from a typical student presentation to a discourse of consequence. The students responded with well-prepared arguments and clear intentions to convince the guest of the veracity of their position.

Consciousness has found its way into popular culture. The public seems fascinated by the mind, and Hollywood has responded with films such as *Inception*, *Shutter Island*, *Sucker Punch*, *Total Recall*, and *Source Code* that pivot on this theme. Such films present an imprecise and sometimes incoherent notion of consciousness. We aimed to prepare students for erroneous public discourse and representations of consciousness. *Bladerunner* (1982), based in a dystopia where nearly indistinguishable human robots have become conscious, was used to provide students the opportunity to practice criticism of films that depict consciousness. A discussion followed the film to underscore both accurate and inconsistent concepts in the film. A similar activity was conducted later in the semester where students were asked to evaluate the use of consciousness in other popular films including the *Matrix* (1999), *Freaky Friday* (2003), *Transformers* (2007), and *Wall-E* (2008). Several students commented they appreciated this section of the course in particular. They felt it demonstrated the pragmatic value of the material, which might otherwise seem abstract or restrained to the armchair or lab bench.

The final presentation was described to the students as a "student directed project…to demonstrate their knowledge, understanding, and opinions towards material covered during class." The students were asked to confirm their presentation topic and format with the instructor, after

which students had complete freedom in developing their lecture. Each presentation lasted between 30 and 40 minutes and included a question-answer session.

GRADING

Graded assessments paralleled the course format. Early assessments required students to demonstrate a strong understanding of theories of consciousness, recall definitions, and cite notable research. Later in the term, students were graded on how well they applied their knowledge by offering well-argued opinions and synthesizing material from various perspectives.

Final grades in this course was based on reading questions and written assignments (32%), a final project (28%), class participation (20%), an exam (14%), and an in-class debate (6%).

Before assignment deadlines and presentation dates the student instructor and faculty advisor met to discuss how best to evaluate the students, including rubric development. Students were given details of these rubrics to ensure their successful completion of the course assignments. Grades were independently determined by the student instructor and faculty advisor, then compared and discussed. Final grades were assigned after consensus was reached.

OUTCOMES

The course was a success. This course demonstrated that an undergraduate taught course can be a rewarding and educational experience for all involved. Most importantly, this course confirms that consciousness can be thoroughly studied in a course in a psychology department and/or neuroscience program.

Two main targets are considered in the course outcomes: the student instructor and the student who participated in the course.

STUDENT INSTRUCTOR

The student instructor was a senior neuroscience major and philosophy minor, with a passion for the study of consciousness. He had demonstrated in previous roles (e.g., student government and athletics) to work well with peers and in expressing ideas. Additionally, he held an interest in teaching on the collegiate level as a career. The result of this academic background, communication experience, and a teaching career goal was that PSYC 499 was a challenging and highly rewarding experience for the instructor. First, the student instructor became thoroughly familiar with a topic of interest. Indeed, teaching this material contributed more to his learning than taking the course might have. Second, the course offered an unparalleled opportunity to explore the student instructor's style of instruction and work through the difficulties in developing and executing a course. Finally, the course was a dynamic alternative to senior capstone research projects and may provide additional, useful preparation for a career or graduate school.

STUDENTS

Student evaluations were collected twice during the semester; at five weeks into the semester and on completion of the term (15 weeks). The students felt the course was rigorous and educational. To the statement, "I feel engaged during lecture," students responded "most often" or "always." All students responded they would recommend this course to their peers. This positive feedback was further exhibited by student comments expressing that they, "Loved the class and the small learning environment" and "Learned a lot!"

Our impression was that the undergraduate instructor fostered a welcoming and comfortable environment. The result was a lively discussion-based course. The students were consistently willing to participate, interact with the material in novel ways, and take risks in presentations, enriching the material and building a community among the students.

LIMITATIONS

The class is built for students who are highly motivated and have a strong background in psychology and neuroscience. Moreover, it was evident that the quality of the students greatly contributed to the success of the course. As a result, we recommend a thorough vetting process during enrollment.

In addition, although the once-a-week meeting period seemed suitable to the students in Consciousness and Mind, others may appreciate a more consistent meeting period. This may have increased engagement with the material, yet would be more demanding on the student instructor.

The student instructor should be aware that teaching a course is akin to taking two. We highly recommend that course load should be decreased while instructing such a course, to ensure proper attention. An over-extended student instructor may result in a less rewarding experience for all involved.

Although this course model can be applied in academic fields beyond neuroscience and psychology, the characteristics of the student instructor should be similar to those demonstrated here. The student instructor must have strong time management skills, be self-motivated, exhibit a strong academic background and performance in the area to be taught, and demonstrate confidence and leadership among peers. These attributes will ensure the quality of the course and that the students taking the course respect their instructor, although he or she is a peer.

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