Reading At Risk: A Survey of Literary Reading in America, a 2004 report sponsored by the National Endowment for the Arts, depicts a clear but bleak picture of the current status of reading. The survey sampled more than 17,000 adults and covered many demographic areas including age, gender, education, income, religion, race and ethnicity. Some specific findings of the study include: “the percentage of adult Americans reading literature has dropped dramatically over the past 20 years,” “the decline in literary reading parallels a decline in total book reading,” “literary reading is declining among whites, African Americans, and Hispanics,” “literary reading is declining among all education levels,” and “the steepest decline in literary reading is in the youngest age groups.” Reasons for the decline in reading are many, but several sources point to television and the rise of Internet use, which is taking away from the reading audience.

The importance of reading is rarely questioned. “Why read?” is usually answered by educators as a method to both expand a person’s vocabulary and to introduce new ideas (i.e., learn). Reading researchers point to the use of words in cognition; the development of thoughts and ideas require the use of words and thus the more words that are available, the more thoughts that can be developed. These claims, and many more advocating the importance of reading, have been reinforced hundreds of times by studies examining the role of reading and early childhood education (e.g., Bowman, Donovan & Burns, 2001; Shonkoff & Phillips, 2000). Clearly, children who read, and read in large quantities, perform better in school than children who do not.

Many college courses have historically been associated with large amounts of reading. For example, many biology courses required students to read trade books such as Rachel Carson’s Silent Spring (Carson, 1962), or James Watson’s The Double Helix (Watson, 1980), but now most instructors elect to focus students’ reading on course textbooks and study guides. As instructors know, these different kinds of books tell very different stories and elicit different responses from readers. For example, whereas Silent Spring was a bestseller that helped launch the “environmental movement,” textbooks are often little more than massive, and very expensive, compendiums of facts that students seldom read, much less study. This has been documented by Burchfield and Sappington (2000) who found an overall decline in reading compliance in assigned textbook reading over a 16-year span.

Despite the fact that reading levels are in decline, but the merits of reading remain in high regard, we designed and implemented a reading assignment for college freshman science students. The objective of this research project was to evaluate the assignment in terms of student opinions and its influence on overall course performance (i.e., course grades).

Background

This study took place at the University of Minnesota within General College (GC), a unit that provides developmental education to a wide array of students, including first-generation college students, students with disabilities, students of color, and non-native speakers of English. GC tries to improve students’ academic skills to a point where they can transfer to other colleges within the university. Students in this study were enrolled in GC 1135: Human Anatomy and Physiology, a freshman-level class involving both lecture and lab. The course used universal design (Bowe, 2000; Johnson & Fox, 2003) as its foundation in that important curricular topics, such as muscle contraction or action potentials, were presented to students in a variety of instructional modes (e.g., lecture, cooperative groups, lab, on-line activities). Instructional methods such as cooperative quizzes (Jensen, Moore & Hatch, 2002) and art projects (Jensen, Moore, Hatch & Hsu, 2003) have been used in the course.

In 2000 we decided to implement a reading project in our course that required all students to read a trade book. (Trade books are different from textbooks in that they are published for a wide audience, e.g., the general public.) The assignment initially required a two-page, typed report from each student that was graded according to the quality of the writing and analysis. The report was discontinued after only one semester for two reasons: Many of the reports were written so poorly that they were difficult to read, and many students’ reports were little more than information copied from the Internet. This was frustrating because we spent large
amounts of time catching cheaters and helping students write. After much thought and discussion, the focus of the assignment was changed from writing about a book to simply reading a book. It was deemed unrealistic to assign students to read a book without some tangible product to hand in, so students were required to produce one-half page of handwritten notes per book chapter, with a maximum of eight pages per book. These chapter notes were graded on a pass/fail basis — either the assignment had been completed (20 points) or not (0 points).

Handwritten notes were required over typed notes because they greatly reduced the risk of plagiarism from either the Internet or from notes saved from previous semesters. Students were informed that the intent of the notes was simply to provide evidence that they indeed read a book.

During the next three years of the assignment, we allowed students to read any trade book having human anatomy and physiology as a theme. We suggested books such as Lawrence Altman's *Who Goes First: The Story of Self-Experimentation in Medicine* (Altman, 1998) and Robin Baker's *Sperm Wars: The Science of Sex* (Baker, 1996). Whereas the instructors enjoyed both these books, students struggled with them and gave very negative reviews of both the books, and the assignment, on the course opinion surveys at the end of the semester. It was clear that the books the instructors enjoyed were not a match with the students' levels of understanding and appreciation. The assignment was again modified in 2003 to include only books that had received positive reviews from students; the assignment now requires students to select one of three different trade books. Frank Vertosick's *When the Air Hits Your Brain: Tales of Neurosurgery* (Vertosick, 1996) is by far the most popular book and involves case-studies in neurosurgery, as well as a description of the long educational process of becoming a surgeon. Atul Gawande's *Complications: A Surgeon's Notes on an Imperfect Science* (Gawande, 2002) is another account of surgery cases and is written at a bit higher level than Vertosick's book. *Stiff: The Curious Lives of Human Cadavers* (Roach, 2003) tells stories of the many different uses of human cadavers. The book is rather macabre, which many of our freshman students like.

In the spring of 2005 the assignment was modified to enable students to read two additional books for bonus points. Reading the first (assigned) book was worth 20 points (about 4% of the total course grade), the second (optional) book was worth 10 bonus points (about 2% of the total course points), and the third (optional) book earned 5 points (about 1% of the total course points). Requirements for the bonus points were the same as for the required book — that is, handwritten notes for each chapter. A list of recommended books was created, but students were free to read any anatomy and physiology trade books for the extra-credit points. Some students proposed reading textbooks from kinesiology and nutrition for the project, but their requests were turned down and alternatives were suggested.

### Research Questions & Methods

In many upper-division courses, an instructor can simply recommend a course-related book and most students will read it. However, in introductory courses that rapidly cover large amounts of diverse information, many students are looking to do only the minimal amount of work to get through the course. Recommending a book for them to read is likely to be met with indifference. Nevertheless, the individuals involved with our anatomy and physiology course have deemed reading a trade book important enough to make it a class assignment.

Data were collected during the fall 2005 semester to answer the following three research questions:

1. Were there any statistical differences in the overall course performances among students who read one, two, or three books?
2. What were students' attitudes towards the book assignment?
3. In relation to ethnicity and gender, were there any statistical differences in terms of who read more books?

All data relating to gender and ethnicity were collected from the university records. Students' course performances were based on scores from lecture exams, lecture quizzes, lab exams, and reports. The bonus points students received for reading extra books were subtracted from the totals to make valid comparisons between groups. Attitudinal data for this study were collected with an online opinion survey conducted during the final week of class. The surveys were collected and organized by a college administrator and sent to the course instructor after final grades were submitted. All students participating in the study signed a consent form during the first week of class that explained both the process and intent of the study.

Of the 120 students in the study, 75 (62.5%) were female, 44 (36.7%) were male, and 1 (0.8%) was undetermined. In terms of ethnicity, 66 (55.0%) students were white, 27 (22.5%) black, 20 (16.7%) Asian, 2 (1.7%) Hispanic, 1 (0.8%) Native American, and 4 (3.3%) of unknown origin.

### Results

Of the total 120 students in the study, 84 read only the one required book, 24 read two books, and 11 read three books. Table 1 shows a distribution of books by ethnicity, and Table 2 shows the distribution by gender. A chi square analysis of the

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>One book</th>
<th>Two books</th>
<th>Three books</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>Count</td>
<td>51</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td>% within ethnicity</td>
<td>77.3%</td>
<td>19.7%</td>
<td>3.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Black</td>
<td>Count</td>
<td>14</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>% within ethnicity</td>
<td>51.9%</td>
<td>25.9%</td>
<td>22.2%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>Count</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>% within ethnicity</td>
<td>100.0%</td>
<td>.0%</td>
<td>.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Asian</td>
<td>Count</td>
<td>14</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>% within ethnicity</td>
<td>70.0%</td>
<td>15.0%</td>
<td>15.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>American Indian</td>
<td>Count</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>% within ethnicity</td>
<td>.0%</td>
<td>100.0%</td>
<td>.0%</td>
<td>100.0%</td>
</tr>
<tr>
<td>Unknown</td>
<td>Count</td>
<td>3</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>% within ethnicity</td>
<td>.0%</td>
<td>100.0%</td>
<td>.0%</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Table 1. The Distribution of Books Read (by Ethnicity)
data in Table 1 showed no significant differences ($\chi^2 = 16.018, p = .099$), thus indicating that each ethnic group had a similar probability of reading one, two, or three books. However, this lack of statistically significant findings may be due to the small sizes of some groups. A visual inspection of the data, shows that 13 of the 27 black students read a second or third book, a higher percentage than any other ethnic group. A chi square analysis of the data in Table 2 also showed no significant differences ($\chi^2 = 1.875, p = .392$), thus indicating males and females had similar probabilities of reading one, two, or three books.

There was a maximum of 635 total points in the course. Students who read only the one required book averaged $540.0 \pm 53.7$ (s.d.). Students who read two or three books in the course averaged $567.0 \pm 55.9$ (s.d.). A t-test used to compare the two groups showed no significant differences ($t(118) = .801, p = .424$).

Three questions from the course opinion survey were used to measure students' attitudes toward the book assignment. Question 1, "What was the best component of this course?" and Question 2, "What was the worst component of this course?" drew comments on a wide array of topics. Most of the "best" and "worst" comments pertained to dissecting eyes in the laboratory. Only two comments in response to these questions targeted the "Read-a-Book" assignment. In the "worst component" responses, one student who read only the required book reported:

I did not enjoy the book report very much. I enjoyed the book itself, but the chapter notes detracted from the experience a bit and made it less enjoyable.

None of the students who read more than one book made negative comments toward the book assignment on this question. In the "best component" responses, one student who read three books commented:

My favorite part of GC 1135 was reading a book outside of class.

None of the students who read only the one assigned book reported it to be their favorite component of the course. The third question asked "Did you enjoy the Read-a-Book assignment? Please comment." Of the 35 students who read more than one book, all answered "Yes" to this question. Students comments about this question included:

[It] gives a student the chance to read something else other than a textbook because it gives you a clear understanding of what you are studying about - it helps you to improve your knowledge.

Of the 84 students who read only the one required book, 74 (88%) marked "Yes" and only 10 (12%) marked "No" to this question. Comments from those who marked yes included:

It is easy points and the book was interesting.

You are able to get points for reading something that you always wanted to know about anyway. Even though I am not an avid reader, I still enjoyed the assignment.

After reading 'When the Air Hits Your Brain,' I noticed I was much more attentive in class and started to absorb the information a lot easier.

Comments from those who did not enjoy the assignment included:

Although the book project is good, I think the paraphrasing in your own notes is pointless. Rather, I think the professor should ask the students to write an emotional response about how it relates to our own lives, society, etc.

I think that it was well intended but also just 'bus work' and took time away that we could have been using to study for what we were actually focusing at the time.

Discussion

The Read-a-Book assignment was very popular. In our opinion, there were three key motives for students' positive reactions to this assignment. First, the assignment was announced on the first day of class when students typically do not question course requirements. Second, our list of books to read had been refined to a point where we knew that the books were a good fit with our students' reading ability and interests. And third, the writing requirement for the assignment (chapter notes) required only minimal effort and was graded on a pass/fail: complete/incomplete basis.

In our anatomy and physiology course we offered students the option of reading additional books for extra credit points. We recognize that the concept of "bonus points" or "extra credit" concerns some science instructors; many equate it with an easy course, or as a substitute for poor performance in other areas (e.g., exams). In our opinion, the extra points for reading one or two extra books is justified in two ways: We believe that reading more books is associated with increased interest in course topics, and students could only increase their course totals by a maximum of 3%, which we consider rather trivial within the context of the whole course.

The trade books used in this study told engaging stories of neurosurgery, medical education, the politics of medicine, the use of cadavers, etc. While students were reading the trade books, the course was covering topics such as the physiology of muscle contraction and the events involved in cell mediated immunity. This disconnect was problematic in terms of the research design in that no direct claims can be made linking student reading trade books and increases in students learning of the topics of anatomy and physiology. In fact, the data show that students reading extra books did not have significantly different course performance when compared to students who read only the one assigned book.

Data collected in this study showed no significant differences in terms of "who read more books" in relation to both ethnicity and gender. Despite this lack of statistical significance, almost half of the black students in the class read a second or third book. Analysis of total course performance (total points earned) showed that students who read extra books performed at the same level as those that read only the one required book. This finding was somewhat surprising and contradicts the common belief that students who read more also perform better in
class. Another unexpected result is that only 10 (8%) of the 120 students answered "No" to the question, "Did you enjoy the Read-a-Book assignment?" Considering recent reports about the decline of reading in all areas of society (see above), one would expect a more negative reaction to the assignment. However, data here show that students are still willing to read (and enjoy reading) when required to do so.

Many instructors hesitate to assign books in their courses because they traditionally require students to produce book reports, which of course must be graded. We quickly learned that correcting book reports was problematic due to writing problems and plagiarism (see above). Our Read-a-Book assignment requires only "chapter notes," which we can review quickly and check for completeness—a very fast process. We recognize that the chapter notes probably do not enhance students' writing skills, but that is not the intent of the assignment. We simply want students to read a book and provide some evidence that the assignment was indeed completed.

Although we required students to read a trade book, the focus of the anatomy and physiology course remained on traditional course objectives and information (e.g., muscle contraction, action potential physiology, etc.) Historically, students accomplish these objectives by taking notes during lectures, engaging in labs, and reading the course textbook. Many science instructors are reluctant to vary from these traditional mechanisms of instruction. The implementation of the Read-a-Book assignment is minimally invasive into a traditional course; it takes only a few minutes of course time to introduce the project, and all other modes of instruction can be maintained. Requiring students to read books opens a whole new mode of learning to them. Based on data obtained in this study, students both enjoy and benefit from the assignment.

References