Retention Efforts at BGSU-Firelands: The Retention Initiatives Implementation Team's Deliberations and First Year Initiatives

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Abstract:
Most colleges and universities today struggle with issues of student retention and ways to improve those numbers on their campuses. Bowling Green State University-Firelands is no exception. Although our enrollment numbers have steadily climbed in the last few years, the retention numbers have also dropped slightly. In order to stop simply wondering why students leave, the Dean of the College, decided to do something about it. He formed a committee called the Retention Initiative Implementation Team or RIIT, to study the issue, and to make recommendations to him. The first term for the committee members was two years, and the chair was given a substantial budget to use in any way they saw fit. This paper will discuss the composition of the committee, the process used to define what retention meant for our campus, identification of measures to quantify success at Firelands, and to develop pathways to ensure students of a successful college experience.

Introduction:

Every year, the BGSU-Firelands campus holds an All Campus meeting called Opening Day. Opening Day gives various campus constituents, including the administration, the opportunity to briefly announce plans for the upcoming semester, and to answer any questions from attendees. A Closing Day event has recently been added, which serves to summarize what was accomplished during the year, and to discuss initiatives that are ongoing. At the 2010-2011 Opening Day gathering, a survey was conducted among all participants asking them to identify the three campus issues that they deemed to be the most important to pursue in the upcoming year, and to make suggestions for solutions to these issues if possible. This exercise proved to be instrumental to the newly formed RIIT committee,

because hundreds of ideas were received from our colleagues, and the results of this survey became one of the instruments used in the initial deliberations. A student survey, discussed later in this paper, had also been conducted during the school year, the results of which were also used by RIIT. Among the themes that emerged from this survey were: better advising methods, the establishment of an Admissions deadline, more developmental classes, enhanced student services such as day care, clubs and better recreational facilities. Assistance with selecting lower priced textbooks, or other methods of providing more affordable books, was also a recurring topic.

At these meetings, and at dozens of committee deliberations throughout the year, it became clear that as administrators, faculty, department chairs and other constituents on campus discussed vital issues at Firelands, retention was becoming an increasingly urgent topic, both the numbers and ways to improve them. Stakeholders across the campus understood that we needed answers to why enrollment numbers were climbing steadily, but retention numbers were as well.

The massive student survey, mentioned above, had been conducted during the Spring 2010 semester, to ascertain what students wanted and needed to make their college experience at Firelands a fuller and less stressful one, as well as what they saw as essential to their success. The Dean and Department Chairs encouraged all faculty to allow some class time for their students to take this survey. Student assistants across the campus were enlisted to deliver the surveys to each classroom, and to pick them up at the end of each class.

The results of this survey became another important tool in the RIIT discussions. It was immediately obvious that many of the student concerns mirrored those delineated in the faculty, staff survey. Among the students concerns were: more online classes, more classes in each discipline and at varying times of the day and night, more extracurricular activities and recreational opportunities, an affordable childcare facility, and better dining options, and many more. We knew that we were on to something, but also that we had our work cut out for us.

Methodology:

The Retention Initiative Implementation Team (RIIT) was comprised of a variety of campus constituents from all strata of the campus, who had volunteered for the committee after a call from the Dean. It included several faculty members: one each from English, Early Childhood Education, Interpersonal Communications, and the Library Director; classified staff: one from the library who was also the campus Classified Staff representative, and the Switchboard operator**;** administrators: the Director of the Teaching and Learning Center, Director of the Visual Communication Technology department , and finally, the dynamic Chair of the committee: Interim Assistant Dean for Planning, Research, and Effectiveness, and Sociology professor, who kept the committee organized and on track. It was a diverse group of enthusiastic and often vocal group of committee members, some of whom had been at the College for many years, and others as little as two years. A couple of the members served nicely as providers of institutional history, which was often appreciated and utilized. With nine such diverse personalities as members, keeping the committee focused was no mean feat, but our chair did a superb job of not only keeping us on track, but providing detailed summaries of each of our discussions from the previous meeting. [1.]

The group met weekly at the beginning of Fall semester 2010. We began the process by defining and identifying ways to measure student retention and success. The library staff member did a literature search and provided us with research on the subject, to provide information to those less familiar with retention issues, and to ensure that we were all starting from the same knowledge base. During a series of lively brainstorming sessions, we produced so many questions that the chair developed a spreadsheet [2]**,** divided into sections which encapsulated the main areas on which we needed to focus our efforts. Those became:

- Definitions
- Measures
- Current State (Fall 2010), and Target State (Fall 2011 and beyond)
- Barriers to success
- Root causes of the barriers

- Tactics for RIIT culminating in recommendations to the Dean

We then broke into smaller groups of three each to discuss all of the categories and to populate the chart with ideas and/or data. At the next meeting, each group reported to the larger group. After writing the ideas on a huge blackboard in our meeting room, and literally taking a photograph of the board, to allow the Chair to fill in the grid on the spreadsheet. The resulting sheet was comical in its size. As might be expected, some of the broad themes were repeated by each group. These became what we considered to be the most pressing issues in our quest to tame the retention beast, and ones on which we would concentrate our efforts going forward.

Questions arose during our meetings that became the basis for our strategies to improve student retention for students at Firelands. Examples of these were: "Why do we lack institutional understanding of students' goals/reasons for coming to BGSU-Firelands?"; "How might we work to better understand student goals once here?"; "What needs appear to be unmet based on the Student Survey results?"; "What means can we use to address those unmet needs/barriers to student success?"; "What other things don't we know, but need to find out?" We produced a running list with proposed solutions to some of these questions an in several cases, generated additional questions.

Six focus areas from above:

Definitions: One perhaps unusual, but important distinction to us was our definition of student success, which we felt was essential to the retention debate. This was a point that RIIT members discussed at length at the beginning of our collaboration. At regional campuses throughout Ohio and elsewhere, increasing numbers of non-traditional students enroll in classes, and may "succeed" in different ways from the traditional model. That model is one in which a student usually enters as a First Year, and leaves as a graduating Senior. Data collection tools, such as IPEDS, do not take into consideration this nontraditional student pattern factor, with which we are all familiar at regional, and probably other two year campuses such as community

colleges. Those tools count retention from Fall semester to the following Fall semester. Therefore, data from regional campuses does not always take into account variables that could be considered as successful student experiences from our type of institutions' viewpoint. Thus, many of the statistics make it appear that we at regional campuses have failed in our educational endeavors judging by retention figures, thus failing our students. However, success to us at regional campuses may actually be measured by such measures as the number of students whose only purpose is to take one or two classes to ensure that they get a raise, or are trained in a specific course or discipline, such as computer science, to enhance their skill sets in the market, or even that they have lost their jobs and need to return to school. Some may never have planned to pursue an Associates or Bachelor's degree. For those students, and our regional colleges, completing those one or two courses *is success.* [3.]

Of course, with or without such a "right" tool, one of regional campus' goals will always be to enroll and retain students who are on an academic path toward earning a degree, while fully accommodating the goals of the other type of students described above.

Measures:

We knew that we couldn't succeed in our own committee efforts toward student success if we didn't know what and how to measure said success. We also knew, as stated above, that we needed to understand why students chose to attend Firelands in the first place. Those reasons, of course, could range from taking one course to earning an Associate's degree, or a Bachelors degree, of which Firelands currently has nine. With this knowledge, the college would be able to determine for future planning, what percentage of students had had their educational needs met and why those who had not. We brainstormed some more to develop a list of quantitative measures we could use to measure student success and consequently realize higher retention rates. Among the areas measured were the following:

- *Percentage of new/transfer students who attend orientation*. Such attendance is strongly encouraged, but not yet mandatory at Firelands. Committee members prescribed to

the premise that although Orientation was very information dense, students were still thought to retain some of the information proffered. At the very least, students would have a face and name of a unit staff member who presented information to them, which would give the student a person to whom to ask questions even if specifics were not remembered.

- *Percentage of identified students who satisfactorily complete two out of four semesters*. It was thought that even if it became necessary for a student to take a break from classes, completion of two semesters might indicate that cessation from course work, could conceivably be due to other factors, such as financial ones, rather than negative issues related specifically to the Firelands experience.
- *Percentage of students who register for a subsequent semester prior to early registration.* This measure could indicate the degree to which the student was enthusiastic about continuing their course work at Firelands.
- *The number of students who transfer to BG or other Ohio campuses, after course work at Firelands.* As stated, the majority of degrees at Firelands are Associate or other non-four year degrees. Therefore, it was thought that transferring to BG indicated that the student had succeeded at Firelands, and had had a positive enough experience there to continue their academic path at BG.
- *Percentage of students who rate their overall experience at Firelands as Outstanding (on exit interviews and surveys).* This one speaks for itself.

Current State (Fall 2010) and Target State (Fall 2011 and beyond): We looked at the enrollment and retention figures as they were at the start of our work (Current State). We then identified initiatives that we were fairly certain could be implemented in the short term, and those that would take more time, (Target State.)

Barriers to Success: The committee identified two timeframes

that held potential barriers to individual student success. The first timeframe was before students actually arrived on campus, and the second, was after they had enrolled and were on campus taking classes.

Some of these factors had been gleaned from the two survey discussed in the introduction, the Opening Day Survey, and Student Survey.

a.) Among the barriers sometimes encountered before arrival on campus included: late admissions which often put the students behind they had been thrust into classes quickly;

b.) lack of understanding of campus resources and policies, due to not having attended orientation or being admitted late; c.) insufficient class choices or not having taken advantage of meeting with an advisor, or advisor not fully conversant in the best courses to ensure success; d.) lack of understanding of how Financial Aid works, or e.) how to manage their overall finances and the need to use aid strictly for academic purposes, i.e. not the purchase of a car.

Among the barriers to success after they are on campus and taking classes include: a.) a misunderstanding of University policies; b.) not enough knowledge of campus services , or who the appropriate people were in campus services to answer questions, thus avoiding frustration; c.) unmet needs such as student study spaces, activities, food choices all of which detract from having a positive "student life" experience.

Tactics for RIIT, culminating in recommendations to the Dean. The majority of the rest of this paper is dedicated to this focus area.

Once we had some definitions and measures in place, our chair proposed that the next step was to form subcommittees. As expected, we had all become much busier as the semester progressed, and we no longer had the time to meet weekly. The purpose of these subcommittees was to develop concrete plans and initiatives culled from all of our discussions, and to develop timelines or stages for

their implementation. We identified those as easy fixes, that might be implemented almost immediately, and those that would be more long term. Each of us volunteered to serve on at least one of these committees, with most of us serving on two or more, depending on our expertise or interests. The subcommittees were as follows:

1. Transitions
2. Advising
3. Campus Navigation
4. Developmental Education
5. Campus Identity

Transitions: This subcommittee defined "transitions" as assisting students in making the smooth transition from high school to Firelands, or from Firelands to BG or another 4 year college or university. As had been decided at the outset, the members consulted with colleagues in Admissions, Career Services, and the Associate Dean for Academic and Student Affairs, in order to avoid duplication of events or projects, and to encourage their participation and hopefully buy-in. This was the motivation for collaboration on all of our subcommittees. The committee developed some projects for the following semester including, a.) Preview Day or night events for potential students in conjunction with the events already held by our Admissions Director and staff, b.) a Skills Workshop series, c.) outreach to area guidance counselors to add a college readiness component to existent Admissions/Financial Aid focused events, d.) development of career or class related study groups either in person or digitally, e.) identification of student needs when transferring to BG or other 4 year colleges, a transition that had been reported by some students as having been less seamless and welcoming than desired, and f.) strengthening the relationship with the Non-traditional Student Office at BG. [3]

As of this writing, most of these initiatives are still in the planning stages, except some Skills Workshops which were held during Spring 2011 semester. The four Skills Workshops that were presented in April 2011, by our Director of Career Services, were: "Not Sure of Your Major? Find the Right One for You; "Get Organized

and Ready for Finals"; "Get Your Resume Ready"; and Find the Job and Nail the Interview". These workshops were sparsely attended, but similar workshops will be held in the future, and it is hoped that through word of mouth and advertising on campus, attendance will be higher in the future.

Advising: This subcommittee consulted with the Manager of Academic Services, and the Associate Dean. The members produced many excellent recommendations for Spring 2010, Summer and Fall 2011 implementation. The immediate focus was on:

a.) Supporting transition to the new advising model with group and peer advising. The model had been accepted by the Dean and faculty while RIIT members were meeting;

b.) piloting a "Pit" kiosk for peer advising with a desk, materials and trained student workers; c.) writing a new student checklist of steps from admission to registration for classes and beyond, to make their student experience successful. d.) conducting exit interviews with the Associate Dean. (NB: At the request of the Chair, some preliminary phone calls had been made by the Switchboard committee member to students who had attended, but not registered for Fall 2011.), and e.) making advising appointments with students prior to the next registration cycle.

Additional ideas were generated for implementation for subsequent semesters. Some of these ideas may be eliminated from consideration due to the decision to hire two professional advisors.

Campus Navigation: This subcommittee consulted with the Office of Technical Support Services, and the Associate Dean. The main thrust of this committee's work was to: a.) develop an online campus directory of full and part time faculty and staff by function or service, not by office or department (not always understood by students), and b.) develop better website mapping, again with usability by function or service sought. As of this writing neither of these has been implemented.

Developmental Education: This subcommittee consulted with

the existent Developmental Task Force, formed at the same time as RIIT. Their initiatives included: a.) bridge/general studies transition classes held in the summer, b.) provisional admissions, despite being open enrollment, and c.) morning/afternoon blocks of classes to assist students in scheduling and family/work issues.

Campus Identity: This subcommittee consulted with the Marketing and Community Relations department and the Coordinator of Student Activities. This committee, perhaps more than any of the others, embodied RIIT's broad definition of "retention." They conducted a critical analysis of campus life, i.e. facilities and student lounge spaces (the Pit); an examination of past marketing and promotion materials, examined vehicles used to communicate with students about Orientation—how we promote it and to elevate its importance to students; and better on-campus marketing of the Teaching and Learning Center, Library, Writing Lab and Career Services.

Results of the work of this subcommittee was the most visible on campus as much of the Retention Team's budget was used to a.) reupholster the Pit furniture, b.) purchase outdoor tables and chairs throughout the campus, where none had existed before due to weather damage and subsequent removal, c.) erect a more permanent and beautiful permanent Writing Lab, which had been makeshift for the last 5 years, since being housed in the Library in 2007, and d.) build a new group study room in the Library, something that students had been requesting for years. *NB:* a newly renovated Teaching and Learning Center had been completed previously, and while not directly related to RIIT's work, the renovation has greatly enhanced student life and was included in our marketing plans.

Conclusion: The Retention Initiative Implementation Team accomplished a great deal in its first year. Whether or not some of its initiatives seemed obviously, directly related to retention, it is certain that students have, or will, notice the physical changes brought about by the committee's first efforts. These changes were designed to improve campus life, and the committee members continue to believe

that they have done that. It is hoped that many of the other more subtle ideas and initiatives described in this paper will continued or developed more fully, and that those, and more, will have positive effects student retention at Firelands. Recently, the new committee chair, after the departure of the previous one, put out a call to the past members for a show of interest in continuing on the committee for another year. A couple of the members have left and been replaced with new members. The remaining members, have also been told that the budget for the second year will be only be used for initiatives more narrowly defined as retention. That is understandable, and committee members remain enthusiastic, and are interested to see what the next year will hold for Firelands' retention efforts. It is believed at least by the members of the Retention Initiative ImplementationTeam, that the work accomplished to this point have been a good start to our efforts to increase retention numbers.

End Notes:

1. Lisa Fisher, Chair of RIIT, 2010-2011, produced summaries after each meeting. These summaries were used in this paper when delineating the methodology and other work of the committee members, who all contributed to the ideas on the sheet.
2. *Student Success Spreadsheet.* RIIT October 13, 2010.
3. *Retention Initiative Implementation Team Success @ BGSU-Firelands project list*
4. NB: The author's background has always been in private or state four year colleges, and I am a relative newcomer to the world of regional campuses. Given my background, a question on my mind may be naïve, or the answer already exists, but *why couldn't all regional campuses, or even regional campuses in Ohio, formulate our own IPEDS-esque tool to measure the variables.* It's true that it might not be"official", but at least we could collect some statistics to measure our own success, and perhaps compare that to other campuses.

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Biographical Information

Sharon Britton is Library Director and Assistant Professor at Bowling Green State University-Firelands. She came to Firelands from Hamilton College, in Clinton, NY, where she had been Director of Public Services for 16 years. She earned her MLS from the University of Rhode Island and has held positions at Colgate University, the University of New Hampshire and Wright State University. Her areas of expertise are copyright and library personnel management. She is a book reviewer for *Library Journal.*

This paper is an offshoot of the presentation she gave at the AURCO 2011 conference, "*Student Retention Initiatives at BGSU-Firelands,*" with her colleagues, Assistant Professor Sue Ellen McComas, and Deborah Carden, two fellow members of the Retention Initiative Implementation Team.

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Applying Economic Concepts to Improve Teaching

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Economists commonly fall back on a number of fundamental concepts to explain the behavior of individuals and firms, and to help describe and understand the economy in general. Many of these concepts are very applicable to the teaching of undergraduates and they can be used to explain and improve the quality of education. This paper will investigate how instructors can apply a wide range of economic concepts to better understand student behavior, enrich student learning, more effectively spend time preparing for class, and improve teaching.

Introduction

Economics as a social science emphasizes how people behave rationally when faced with various costs and benefits that provide incentives for making choices and taking action. Fundamentally the science of economics is about choice. Throughout the term students make choices (usually rational) that are largely influenced by incentives provided by their instructors. Recognizing the issues that motivate students and how incentives will change student behavior, instructors can make modifications to how they teach and assess students. By doing this student learning should improve. Specifically, this paper will explain how three economic issues: Economic Costs, Incentives, and Comparative Advantages. It will explain how these issues relate to teaching and also will provide suggestions.

Economic Costs

There are a number of costs (Opportunity cost, Sunk Costs, and Marginal Costs) on which economists focus. The Opportunity Cost of any choice is commonly defined as a forgone choice or the value of the next best alternative. (Stiglitz and Walsh 2006) This allows economists to better determine the value of something, particularly when it is difficult to measure due to individual tastes or the lack of a straightforward metric like money or time. For example, it is not straight forward to measure an individual's value of a kiss or a bee

sting.

The Opportunity Cost of student's studying is the countless other things they can do with their time (which does not include work since this is generally not the next best thing they would want to do with their study time). For example the Opportunity Cost of studying could be sleeping, watching TV, or going out with their friends.

A Marginal Cost is the cost of the next item. Economists are interested in margins because they are very important in decision making. It is not how much you value the first gallon of water you consume that determines how much you purchase, but how much you value the last gallon. The first gallon of water you consume each month is worth quite a lot, but after you have drank as much as you want, cleaned your dishes … the last gallons you consume are readily "wasted" by flushing them down the toilet.

For students, the Marginal Cost (which in this case is also an Opportunity Cost) of studying for the next class is usually small. If they don't come to class prepared the cost to them is often nothing.

Students not studying for the next day's class face all the Opportunity Costs mentioned but, in particular, they face an economic problem of Dynamic Inconsistency or Time Inconsistency. Dynamic Inconsistency occurs when decisions made at one point in time have a different result for different time periods. A typical example of Dynamic Inconsistency studied in an economics course is when the Federal Reserve increases the money supply. In the short-run this will lower interest rates and increase output - which is good. However, if this policy is continued, it will eventually cause inflation and lower output - which will hurt the economy. But if the long-run is just a bunch of short-runs, then when is it optimal to raise interest rates? An optimal decision for the short-run is harmful in the long-run.

When teaching students, the Dynamic Inconsistency problem is also present. For example if you tell your students on the first day of class they can buy an extra day to study for their first exam (say for $10), none will take you up on it. By asking the same question to the same students the day before the exam, many will readily be willing to pay even $25 for an extra day to study - due to Dynamic Inconsistency. One reason for this Dynamic Inconsistency is that the Opportunity

Cost for students of not studying for any one meeting of a class is small, but the end result of never studying (maybe trying to cram in the final hour), is large. To minimize this problem the instructor can increase the cost to the students of not preparing for every class. Pre class quizzes are one way to address this problem. Students are told up front that these quizzes do not account for a large percentage of their grade, but the completion of the quizzes will demonstrate a consistent effort. The purpose of the quizzes is not to test their understanding, but to provide an incentive to come prepared to class. Because make-up quizzes will not demonstrate that students are preparing for class, I do not allow them. However, since the students take these quizzes online I do let them take it twice. The reason for this is both because the purpose is not to test their knowledge and that if they do bad the first time they will (hopefully) re-read the chapter or at least look over the question's topics they had on their first attempt before taking a second attempt. Essentially, these pre class quizzes solve the Dynamic Inconsistency problem by helping students to better align their incentives.

Incentives

Incentives underlie many economic theories and principles. In the simplest of economic models the economic man is computer-like in how he reasons, machine-like in how he works, and has only his self interests at heart. Adam Smith, (Smith, 2011) recognized as the founding father of economics, provided justification for individual's self interest when he discussed the "Invisible Hand". In his book, An Inquiry into the Nature and Causes of the Wealth of Nations, Smith explains that by pursuing his own self interest the economic man's decisions result in the best outcome for all society - as if he was lead by an invisible hand.

Instructors would like to think that by appropriately testing students and assigning grades they provide the proper incentives for students to study and learn. Unfortunately, the self interest of many students is not to learn, but only to receive a high grade. Of course this is not true for all students, but because time and effort are valuable to everyone, there are always other options available (Opportunity Costs)

and students make what they feel is the best choice at any particular time. Unfortunately, due to dynamic inconsistencies it is often the case that getting the high grade is more important to a student than learning (particularly when an exam date is quickly approaching). Taken to an extreme this explains the incentive to cheat, which if successful, will allow the student to get the higher grade without learning anything.

The problem here is what economists call the Principal Agent Problem. Usually the principal is the owner of the firm and the agent is the worker. The owner would like the worker to always put forth their best effort to make the firm the most money possible, but the worker wants to get paid as much as he can get without having to put in tremendous effort. For some jobs the owner can pay the worker piecemeal so for example the number of brooms that get made exactly determines the amount the broom assembler gets paid. This does a good job of aligning the interests of both parties.

In academia, it is a bit more difficult. For years I gave my students papers to write in a Global Economics course. The papers were often comparison type papers that looked at how the economies of different countries compared to each other or how they compared to the U.S. I was generally very pleased with this assignment, but I wanted them to read and learn about other countries beyond the two they chose. Therefore, I gave all the students a copy of every other student's paper to read. I told them I would have one essay on the final exam from one of these student's papers so they should read them. My efforts to align the interests failed miserably. Year after year the majority of the students got this essay incorrect which suggested they did not read the other student's papers. The Opportunity Cost of reading all the papers was obviously higher than the potential loss of points on the final. The solution to this problem came after I found out about CPR (Calibrated Peer Review). CPR is an online grading program that is freely available to any institution. It was originally a National Science Foundation project by UCLA and is still hosted by UCLA. Students submit papers to the CPR site and take a calibration where they practice grading papers. The students then grade three of their peer papers and the CPR program assigns them a grade that is based not only on how their peers graded their paper but also on how

close their grades were to the other student's grades. CPR is designed so that students who grade too hard or too easy (relative to their peers) are penalized. Using CPR provides students with a significant incentive to read and think about other student's work since their grade will depend on doing so.

I also help align the students' incentive to learn vs. cheat by submitting all their papers through Turnitin.com. Turnitin.com is an online program that helps to identify plagiarizes. Recently, WSU moved to a Desire2learn platform for web instruction. Turnitin is integrated directly into the dropbox of Desire2learn so student papers are automatically submitted to Turnitin.com.

Comparative Advantages

In economics the concepts of advantages in trade deal with how countries (or individuals) can specialize and trade and how this can make both parties better off. It is not the absolute advantage (or ability to produce more of a particular good) that a country may have that determines the good they will produce but the relative advantage in producing one good compared to another. This is an intuitive concept and important to understanding how global trade has lead to large increases in the global standard of living over the past hundred years. A simple example is that of a lawyer who pays a secretary to type. The lawyer may be better at typing then the secretary, but will readily pay the secretary to do the typing because the lawyer's comparative advantage lies in practicing law. Both the lawyer and the secretary benefit from specializing in their comparative advantages and trading.

Our students come to the classroom with different life experiences and skills. Older students often have experiences raising families or working in large organizations. Many of the younger students also work fulltime, often in family operations, small businesses, or agriculture. In addition, students have varied levels of aptitude for writing, mathematics, or even study skills. By promoting interaction among students you provide the opportunity for them to share their knowledge and experiences. This not only allows them to work through problems more effectively due to the adage "two heads

are better than one", but it allows them to practice communication and teamwork skills that will be used throughout their lives. Depending on the exercise or problem set, students will naturally be more willing to contribute where their strengths lie. By working beside other students they will readily be able to show their classmates how they solve problems, or explain results.

Not only do students learn best in different ways, they also approach studying and the effort they put into assignments differently. Having students share their daily homework or other assignments with each other is an effective way, not just in allowing them to learn from each other, but to emphasize what level of work is appropriate.

The instructor is not always the best person in the class to explain a topic. The more students interact with each other the greater the opportunity to help students understand. An easy way to capitalize on student's comparative advantages is to provide in class assignments where students work in groups, and are then called upon to explain their answers. Students can also be asked to explain their homework answers or summarize their paper to other students in their group instead of just turning them in to be graded. This not only provides an opportunity for students to learn from each other, and practice oral communication skills, but it also serves to demonstrate how seriously some students are taking their academics.

Conclusion

Steven D. Levitt & Stephen J. Dubner in their book, "Freakonomics", (Levit and Dubner, 2005) show that economics provides a framework not just for analyzing government statistics but also to explain the everyday world around us. In this same vein, this paper has used economic principles and concepts to explore why students behave the way they do and how instructors can improve learning by providing students with appropriate incentives. There are countless other economics concepts that can explain and improve teaching that I hope to explore in a future paper. Topics such as: why extra credit causes students to behave irrationally and how it can be used to improve learning - not just student grades, or how economics can explain the success and disappointments of online teaching.

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Five Practical Strategies to Improve Teaching – Really!?

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There is widespread agreement that the passive student absorbing knowledge from the professor at the white board is not the most effective method of instruction. Students often learn quicker and gain a more thorough understanding when they take a more active role in their learning. Because fundamental course changes are already required as many schools convert from quarter to semester systems this is an excellent opportunity to rethink how we teach and move towards a more active learning pedagogy. This paper will investigate how instructors can approach making changes to their teaching to minimize the costs involved in the change and improve how their students learn. Five specific strategies are outlined to help faculty who are interested in moving towards a more active approach to their teaching.

Introduction

Instructors spend the majority of their class time lecturing to their students. For example, Dee Fink (2003, p.3) cites a study that finds 78% of eighteen hundred faculty at various sized institutions use lecture as the primary method they use to teach their students. Fink goes on to provide evidence that lecturing is ineffective in helping students to retain information, apply knowledge to novel situations, problem solve, or to help motivate students to pursue additional learning. Although most faculty have been encouraged to practice teaching methods that involve more student-centered activities, collaborative activities, simulations and role playing, or any other active learning method, they have largely resisted changing. It is too often the case that faculty deliver the content, work out the problems, and ask closed end questions, with little opportunity for student involvement. Maryellen Weimer (2002, p73) also provides evidence from several studies that find faculty rely too heavily on lecturing and she reports that on average faculty members spend about one minute of class time per forty minutes of class on activities involved in student participation. Weimer also notes that faculty members typically

overestimate how much time they claim to use while actively involved with their students.

The lecture method of instruction has been used for hundreds even thousands of years by philosophers, priests, and campus faculty worldwide. Part of the reason for this is likely the result of current faculty teaching in the manner in which they were taught. Lecturing is familiar and comfortable to new teachers. There are also some fundamental advantages to the lecture method. Lecturing is efficient at conveying large amounts of material to large numbers of students in a short period of time. Lectures can be highly structured and can provide clarity as to what is covered and what students are expected to have learned. Kavous Ardalan (2006) investigates the underlining philosophy of differing teaching methods and finds that lecturing is the preferred method of instruction for the realist paradigm. The realist paradigm finds the primary focus of the realist is for the learner to be knowledgeable about the subject. The lecture method therefore allows for students to be exposed to the facts in an efficient organized way. Ardalan also outlines how the pragmatist paradigm focuses on action oriented education. The pragmatist use case studies, cooperative learning, and student projects. Pragmatists feel the process of discovery and applying knowledge in actual situations is as much (or more) important than factual knowledge. When problem solving and/or critical thinking are important tasks to be taught, pragmatist methods are likely to be more effective. A more interactive instructional method is also likely to improve student retention of the material. It has been found that students retain 90% of what they have the opportunity to say and do, but only 10-20% of what they hear or read (Reif 1993). For most courses, relying entirely on the lecture method of teaching is clearly not ideal compared to a method that keeps students more actively involved.

Role of Instructor

There are countless articles and books on how higher education teaching can best be transformed to improve learning. An often cited starting place is Chickering and Gamson's 1987 article entitled "Seven principles for good practice in undergraduate education". In this article

four of the seven principles directly deal with the active involvement of students in their learning. Namely, Chickering and Gamson emphasize that high quality teaching occurs in classrooms where there is student faculty interaction, cooperation among students, active learning, and an emphasis of time on task.

Two of the more popular books on improving teaching are "Creating Significant Learning Experiences" by Dee Fink, and "Learner-Centered Teaching" by Maryellen Weimer. Although these authors take different approaches they both largely agree with Chickering and Gamson's work. Fink (p28) emphasizes five principles that make for a good course;

Good courses are courses that:

- Challenge students to significant kinds of learning.
- Use active forms of learning.
- Have teachers who care – about the subject, their students, and about teaching and learning.
- Have teachers who interact well with students.
- Have a good system of feedback, assessment, and grading.

Although functional knowledge is an important part of what students need to learn, Fink suggests that application, integration, caring, and learning how to learn are more important for what is termed significant learning. When faculty over emphasize teaching functional knowledge they fall into the trap of never having enough time to do anything in class but cover (often by lecturing) the material. This problem has become larger as current textbooks contain additional, and increasingly longer, chapters with each new edition. Active learning though either experiences or reflection is emphasized as an important component of significant learning. The student should have the opportunity to learn by practicing in meaningful if possible realistic or authentic situations. If these opportunities are not available then indirect active learning exercises like case studies, group problem

solving, games, simulations, or role-playing are other methods that can allow students to actively learn. These indirect methods of learning also have the advantage of being safer since games or role-playing does not affect real people and will not result in a real loss of money or cause damage to property.

In "Learner-Centered Teaching" Maryellen Weimer focuses on how to facilitate student learning. She suggests that students have the ultimate responsibility for their learning and the role of teachers is to facilitate student learning. The role of instructors is to provide opportunities for students to "do" tasks that allow them to learn. Faculty should limit the organizing of the material, generating examples, asking and answering questions, solving problems, summarizing the discussion... Instead students should gradually be expected to take on increasing amounts of these tasks. She suggests that teachers refrain from telling the students everything they need to know in the course and instead leaving it up to students to find what they need to know or "let them discover" by giving them opportunities to work together and the appropriate incentives to learn. Students for example should be responsible for their learning so Weimer suggests instructors provide logical consequences to student actions or inactions. Teachers usually agree that they want their students to master the content of the course and be able to effectively apply that content in useful ways. The problem is that faculty members often spend all or the majority of their class time lecturing on the content and this leaves little time to allow student to master the application of the content. Weimer suggests that the solution to this is to move much of the learning of content to out-of-class activities which leave the in-class time to focus on discussions and class activities that promote more active learning. Near the end of her book Weimer offers an alternative metaphor to replace "guide on the side" for describing what she sees as the more active role of the instructor. She suggests the alternative metaphor of a "helmsman" (as in the person that steers and coordinates the efforts of the oarsmen) captures her view of the ideal teacher. This teacher is the leader of students or the one that coordinates their activities. With this view the boat will only arrive safely at shore if the teacher facilitates the efforts of individual

students while at the same time encouraging student cooperation.

Changing Teaching

"It is one thing to say it but quite another to do it." Where can a faculty member start if they want to change their teaching technique to achieve a better learning outcome of their students? In the next few years several of Ohio Universities are moving from a quarter to a semester calendar. This presents a unique opportunity to revise the content we teach and how our courses are taught. Under the semester calendar a standard 3 credit hour course will be four weeks longer while meeting less time per week as compared to a 4 credit hour quarter course. Courses will often have additional meeting times but for shorter periods of time. Often this will necessitate significant changes in the manor courses are taught so this is also provides an ideal time to implement courses changes that will facilitate student learning.

Below are five suggestions (in no particular order) on how to transition your courses away from the passive lecture format to a more active learning environment.

The first suggestion is to label courses as in a "mixed mode" format and then require students to do a significant amount of work outside of the meeting days. This will accomplish a number of things that will immediately make class meetings more productive. First the faculty member will no longer feel it is their responsibility to "cover" each and every item that students will be expected to understand for succeeding in the course. It will also empower the student to learn at the speed and in the manor that best suits them. The majority of the class meetings can be spent on the most difficult and most important sections of the material (the concepts that will be built on later in the course). Classroom meetings will still provide the students with the opportunity to ask questions about concepts they have struggled with on their own but usually these are the very ones focused on during the in-class meetings. For this strategy to work, students will need to be provided with incentives to come to class prepared. One way to do this is to have reading quizzes. Students are required to take one short quiz or work through a problem set for every chapter to be

covered in class, prior to the class meeting. These grades should be meaningfully large but small enough so they will not end up lowering a contentious student's final grade. It should also be made clear that these assignments are not meant to test student's understanding, but to provide incentives to prepare for class. To compensate students for the extra time they spend reviewing power point presentations, taking quizzes, and otherwise working through pre-class assignments, you can shorten class or give them "days off". The quizzes can be online and objective so as to not add significant grading time to the instructor. This requires additional efforts on the instructor, particularly the first time they do this, but the payoff of having productive meeting days with students is well worth the efforts. The additional meeting times under a semester schedule also has the effect of spreading the course out which provides students with more time to do their out of class work before the next in-class meeting day which is an added benefit.

The second suggestion is to make any of the changes gradual. Unless you are just starting your career, the way you currently teach is probably working or you would have already changed. It would be a mistake to trash what has been working, so don't. Experiment with active learning exercises and keep what works over time. Change is difficult for students and instructors and many students and instructors are comfortable with the passive lecture format. No one should have the feeling that a gun is being put to their head and any approach is the only one. By working in a few changes over time you may find that the more active approach is not only more satisfying to the instructor and more enjoyable to the students, but also that students end up learning more.

The third suggestion is to use class time more effectively. It is hard to give up lecturing but the day I committed to doing less of it was the day my students left the classroom actually learning something. During the typical passive lectures students mindlessly copy notes. The examples instructors provide are probably interesting, insightful, or even humorous, but students rarely make note of them. When it comes to studying for the exam students use only the definitions, graphs, and outlines that were on the whiteboard or power point. Instead, everything that was written on the whiteboard, along

with and the examples, should instead be given to the students ahead of class. This would allow them to study the notes before class and provide them with a more complete set of notes to review for the exam. The instructor can now spend the in-class time on the most difficult parts of the content and the focus can be on applying the material in active ways.

A fourth suggestion is to identify what you want your students to learn during each class and make it clear to them that they will leave the class knowing these things. This will help focus the discussions and activities to a few accomplishable items. Also it will keep everyone honest about what needs to be completed for the class meeting to be a success. For this to be effective the instructor needs to limit the course to just a few topics (say two to five) and provide a variety of approaches to allow the students to apply, practice, think about, and discuss the items. Some type of feedback is essential for this to be a success. A grade is not important here but the students should be given the opportunity to answer questions that will be similar to what they will be expected to answer on an exam. The goal here is to provide a variety of activities where students work together, use notes or the textbook, freely ask the instructor questions, and explain answers to the class. Close attention needs to be paid to the clock to keep the students on task, and trial and error is certainly needed to have this work effectively. It is very satisfying when the instructor gets unanimous agreement from the class that everyone understands the concepts listed as the learning goals of the day.

The fifth suggestion is to mix it up. Do your best to put variety into the classroom activities. Give the student's crosswords or seek and finds, put them on teams for a debate, get out of the classroom to visit a business or park, have a speaker come to the class to provide an alternative perspective. Dream up a contest where they each put in a dollar. Experiments are not just for the physical sciences, have your students test different theories or view points. There are countless ways to provide students with the opportunities to actively learn. Dee Fink has recently been published special issue (issue 119) of the journal New Directions For Teaching and Learning. This issue provides case study examples of faculty members teaching a variety

of different subjects who have applied active learning experiences in their class rooms. Not every topic will lend itself for active learning, and again the activities will often need to be modified or eliminated, but students generally appreciate the efforts even when the activities encounter problems.

Conclusion

This paper has argued that traditional lecture method of instruction is often not ideal. Students not only fail to retain a general understanding of the subjects they are taught but, more importantly, they do not improve their ability to function in an increasingly complex world that demands higher order problem solving and complex reasoning to succeed. By now the often repeated metaphor of "guide on the side" vs. "sage on the stage" is well known, but how faculty can make the move to being a more passive guide and allow for a more active student is not clear. Hopefully, the five strategies outlined in this paper can help interested faculty move in the direction of a more active teaching/learning style. Although the focus of this paper has been on the improved learning outcomes of students from this approach, what is equally true is that this approach is considerably more satisfying to use for the faculty member. Having students that are prepared for their in-class work and empowering them to be more responsible for their learning outcomes results in students caring more about what they are learning instead of merely what is on the exam. Changing the way a faculty member has taught for many years will certainly require additional time and effort but the rewards will be immediately apparent and these rewards will increase over time.

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Biogrraphical Information

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Critical Thinking in Introductory Psychology: Motivation Trumps Self-Regulated Learning

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As educators, we construct a number of goals when it comes to teaching our students. Regardless of discipline, we want our students to master course content, and we also want them to develop critical thinking skills that will (hopefully) transfer to other courses they take and into other daily life situations. Professors construct their courses to maximize knowledge of course content, but linking course content to critical thinking skills can sometimes seem daunting.

On the plus side, a major requirement for critical thinking development is deep content knowledge (Willingham, 2008, 2009). Deep content knowledge typically refers to material learned beyond the level of rote memorization; when one has deep content knowledge of a topic, that individual has learned the material to a level where higher-order cognitive skills, such as analysis, synthesis, and application to novel situations, can be performed. In other words, students must have more than a basic definition memorized (i.e. surface learning) – they must also understand the definition and be able to put into their own words (i.e. deep learning) before they can begin to critically evaluate what they have learned. Thus, most professors, even if they are just focusing on factual knowledge in the discipline, are already halfway towards developing critical thinking skills in their students. In order to be able to use what they have learned, students must also develop a set of metacognitive strategies so that they can reflect on the content knowledge they have learned, be able to analyze the content knowledge they have gained, and be able to apply that information to new situations (as an indicator of transferability).

One such metacognitive strategy is self-regulated learning (Pintrich, 2003; Zimmerman, 2002). In self-regulated learning, the student reflects on his performance on some assessment of content knowledge gained, and then considers what he can do to improve on future assessment performance. Thus the student is required not only

to learn the course content for a first assessment, but he must consider what actions need to be taken to improve his learning of the course content and his ability to apply this course content to new situations. Students learn skills of attention, monitoring, and adjusting from feedback.

In considering the link between self-regulated learning and critical thinking development, it may be easy to assume that as long as we can provide self-regulated learning opportunities with course content, then critical thinking skills will improve automatically. However, this is not always the case. In a previous case study (Cummins-Sebree, 2009), I provided self-regulated learning (SRL) activities that required students to reflect on their critical thinking activity performance to a section of Introduction to Psychology while having a second section of the same course serve as a comparison group (no SRL activities). I then compared the two sections on their performance on the critical thinking activities, exams, and cumulative paper. Students in the SRL group did not perform better on the critical thinking activities, exams, or cumulative paper compared to the comparison group of students. The first exam was provided before the SRL activity work began, and both sections scored equally on that first exam. Thus, the fact that no other differences in performance were found indicates that the SRL activities did not improve development in critical thinking in my Introductory Psychology students (and not that the SRL class was somehow different before assessment began in terms of academic ability). However, I did not measure a possible third variable that may have played a role in student performance in that study – that third variable is motivation.

Older models of self-regulated learning tend not to include motivation as a critical factor in the development of critical thinking skills while attaining course content knowledge. In fact, what Pintrich (2004) described as the information processing model to student learning (a precursor to subsequent self-regulated learning models) focused solely on cognitive factors (e.g. memory, strategies, etc.), and was the preferred approach to understanding student learning by North American researchers in educational psychology until the mid-1990's. However, Garcia and Pintrich (1992) found that level of intrinsic

motivation correlated with academic performance; the higher the level of intrinsic motivation, the higher academic performance for students. Thus, self-regulated learning approaches to student learning began to include additional factors that may impact student performance, such as affective, socio-contextual, and motivational factors (Pintrich, 2000, 2004). European models of student learning and motivation, denoted as student approaches to learning (SAL), not only have included student motivation into the equation between content knowledge and critical thinking, but they have also specified the difference between external motivation (linked to surface learning) and internal motivation (linked to deeper learning) (Biggs, 1993). Current self-regulated learning models still often do not differentiate between external (e.g., gaining a job, getting a raise, etc.) and internal (e.g., love of learning, pride in succeeding at a task, etc.) motivation and their possible impact on academic performance in conjunction with self-regulated learning, with an underlying assumption that multiple motivation factors can be at play for any given student.

This distinction between external and internal motivation is an important one for professors at regional campuses and community colleges. Because of open access policies, our students have less developed metacognitive skills than students at traditional four-year universities. Our students are also more likely to be returning (i.e. non-traditional) students or ones who are focused on getting a professional certificate or degree with the primary motivating factor being getting a good (or better) job. Might our students be motivated more by external forces than internal forces? If so, might we see differences in the impact of self-regulated learning opportunities on critical thinking development based on levels of motivation?

The purpose of this current study was to determine the influence of motivation and self-regulated learning on the development of critical thinking skills in my Introductory Psychology courses taught in Autumn Quarter, 2010. In creating this study, I wanted to be able to answer the following questions: a) Will having students reflect on performance through SRL activities lead to an improvement in grades on critical thinking assessments?, and b) Will motivation predict critical thinking performance better than SRL activities?

Method

Participants

All students in my three sections of PSYC101 Introduction to Psychology I in Autumn Quarter, 2010 were eligible to participate in this study; however, assessment and survey data were collected only from those students who a) were present on the day the survey was presented and b) completed the survey correctly (i.e. provided at least the last name so that the survey data could be linked to assessment scores). Two sections (8 AM and 10 AM) served as the SRL groups who received activities designed to make them reflect on their critical thinking activity performance, while one section (9 AM) served as the comparison group that did not receive the SRL activities. Twenty-one students (six males, 15 females) from the 8 AM class and 18 students (four males, 14 females) contributed data in the SRL sections; 19 students (six males, 13 females) contributed data from the 9 AM comparison section.

Class Activities

In all sections, students were given five critical thinking activities in which students had to apply course content to a novel behavioral situation to explain how that situation could occur (e.g. if a situation included walking, what would need to happen in the brain to make walking happen when covering the chapter on the brain and behavior?). They were also given three regular exams with application-based, multiple-choice questions similar to the critical thinking activities, as well as a final exam that contained a subset of questions from the three regular exams. Students in the SRL sections also completed four SRL activities that included seven questions for reflecting on their performance on the prior critical thinking activity and various life issues that may be impacting their activity performance.

Measures

At the end of the quarter, the students were also asked to fill out a survey in which they rated statements related to the critical thinking activities and motivation, while the students in the SRL groups also rated statements on the SRL activities. Each statement was rated on a 1

(Strongly Agree) to 5 (Strongly Disagree) scale, and both positive and negatively worded statements were presented. An example of a positively-worded statement on the critical thinking activities was "I found the in-class group activities to be important in learning the content for this course." An example of a negatively-worded statement on SRL activities was "The self-regulated learning questions did not help me monitor my learning when studying for exams."

The data collected included the responses to the surveys and the scores on the critical thinking activities, the regular exams, and the cumulative final exam. To determine whether SRL activities impacted critical thinking performance, I compared the three class sections on their scores for the various critical thinking assessments using a One-Way ANOVA for each assessment. To determine whether responses to motivation questions were linked to critical thinking performance, I combined the data from the three class sections and performed a One-Way ANOVA for each assessment with rating on each question as the between-subjects factor. LSD post hoc tests were performed for those One-Way ANOVA's that were statistically significant to determine where differences in groups occurred. SPSS 17.0 was used to run the analyses.

Results

To ensure that the students in the three sections were equivalent in Introduction to Psychology-based critical thinking skills prior to the SRL manipulation, a One-Way ANOVA was performed on Exam #1 scores; if there were no differences between the three sections at this early assessment point in the quarter before SRL activities began, then any differences in assessment performance later in the quarter could be attributed more confidently to the SRL manipulation. There was no significant difference across the three class sections on Exam #1, $F(2, 53) = .318$, $p > .05$; out of 150 points, the SRL sections (8 AM: $M = 93.27$, $SD = 23.24$; 10 AM: $M = 86.39$, $SD = 19.54$) performed equally to the comparison section (9 AM: $M = 89.47$, $SD = 25.10$). Thus, the three class sections could be considered equivalent in the types of critical thinking skills needed in my Introductory Psychology I course prior to the SRL manipulation.

The One-Way ANOVA's performed on the assessment categories with class section as the between-subjects factor to determine the impact of SRL activities on critical thinking development indicated that, as a whole, the SRL activities has little to no impact. Of the five critical thinking activities, three regular exams, and the final cumulative exam, the only assessment in which the three sections differed in performance was for the last in-class 40-point critical thinking activity, $F(2, 49) = 3.312$, $p = .045$. However, the results of the post hoc tests showed that the 8 AM SRL section ($M = 33.44$, $SD = 2.45$) scored significantly lower than the 10 AM SRL section ($M = 35.89$, $SD = 2.11$), and neither of those sections were significantly different from the 9 AM Comparison section ($M = 34.00$, $SD = 4.13$). Interestingly, the two sections that were different were both SRL sections, with the comparison section scoring in the middle. Thus, I cannot claim that the SRL activity impacted this particular critical thinking assessment.

The One-Way ANOVA's performed on the assessment categories with ratings on motivation questions as the between-subjects factor provided more interesting results. Some motivation questions did not yield significant differences in assessment scores; these questions include the following:

1) I took this course because I really wanted to learn about psychology.
2) I was really interested in this course at the beginning of the quarter, but I lost interest by the end of the quarter.
3) I dreaded coming to this class every time we met.
4) I really didn't care very much about taking this course at the beginning of the quarter, but I started to enjoy it at the end of the quarter.
5) At the beginning of the quarter, I really wanted to do well in this class.

Other questions, however, yielded significant differences when comparing critical thinking assessment scores, particularly for the first critical thinking activity evaluated for this study. For the statement "I took this course because it is required for my degree program," there

was a statistically significant difference in scores for this first activity based on statement ratings, $F(4, 46) = 3.690$, $p = .011$; students agreeing with this statement ($M = 30.33$, $SD = 4.77$) scored lower than

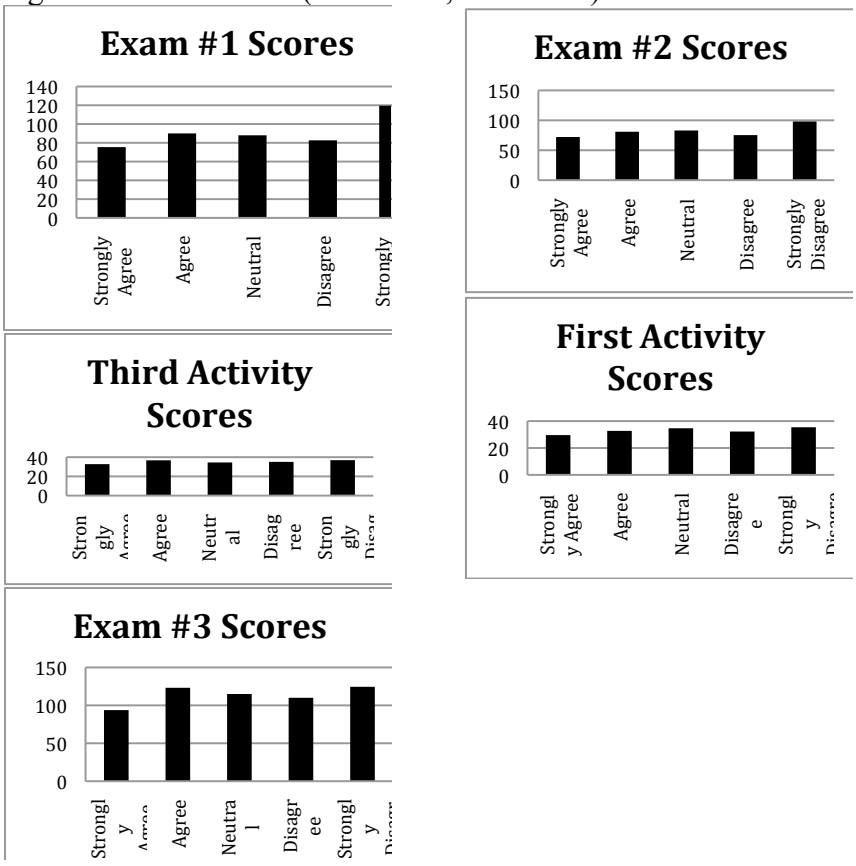

Figure 1. Raw scores (Y-axis) for the five critical thinking assessments in which ratings (X-axis) on "At the beginning of the quarter, my goal was simply to pass this class." provided significant differences. For Exam #1, #2, and #3, the raw scores are the points earned on the exams out of 150 points. For the First and Third Activities, the raw scores are the points earned on the activities out of 40 points.

Those that strongly disagreed with this statement scored significantly higher than those who strongly agreed with this statement on all five assessments; those who strongly disagreed with the statement also scored significantly higher on Exam #1 and Exam #3 than those who provided all other ratings, and were also significantly higher than at

least 2 other rating options for the other three assessments. Thus, those who strongly disagreed with the notion that their goal was simply to pass the class routinely performed better at critical thinking assessments than those who strongly agreed that they simply wanted to pass the class. In fact, those who strongly disagreed with this statement averaged roughly 26 to 44 points higher on the regular exams than those who strongly agreed with this statement (Exam #1: $M = 119.50$ vs. $M = 75.42$; Exam #2: $M = 98.00$ vs. $M = 72.08$; Exam #3: $M = 124.50$ vs. $M = 93.75$, respectively), a difference of one to two full letter grades.

Discussion

The purpose my study was to determine the influence of motivation and self-regulated learning on the development of critical thinking skills my Introductory Psychology courses. Based on the results as a whole, we can see that providing opportunities for self-regulated learning development did not influence the development of critical thinking skills in my students, while responses to questions concerning motivation were related to performance on critical thinking assessments.

As this is the second study I have done in which I provided self-regulated learning opportunities to my PSYC101 students that also resulted in no meaningful differences in critical thinking performance (with Cummins-Sebree, 2009 being the first), this work provides additional evidence that older models of self-regulated learning (such as the information processing approach) may not be sufficient to lead to effective classroom interventions. As newer models indicate (Pintrich, 2004), motivation may be an additional variable that links development of self-regulated learning with critical thinking. Based on the results of this study involving motivation statement ratings, the importance of student motivation becomes clearer, however determining which motivational factors are driving students (internal vs. external) may be what is required to boost the effectiveness of classroom interventions that involve self-regulated learning.

Students in my PSYC101 classes who gave motivation ratings that focused more on an internal motivation towards class and college in general (i.e. goal for being in college is to get a good education, goal for the course was not simply to pass the class, did not simply take the

course because it was required) scored higher on various critical thinking assessments than those students who gave motivation ratings that focused more on an external motivation towards class and college (i.e. goal for being in college is to get a degree for a job, goal for the course was simply to pass the class, took the course because it was required). Thus, the trend in the data involving motivation was fairly simple: lower performance on assessment of critical thinking skills was more likely for students who were in the class and college in general for reasons *other than* learning the material, getting a good education, and expanding their intellectual horizons, which are reasons we associate with internal motivation.

There are limitations to this study that may impact how one views the results. First, the motivation questions from the survey did not come from a standardized survey; however, they were generated based on the variety of reasons students attend a two-year regional campus and included both positively- and negatively-worded statements to offset biased responses. Second, this course is a 10-week quarter course instead of a 14- or 15-week semester course, thus it may be possible that the SRL activities would have yielded significant differences in critical thinking assessment performance if there was more time to provide them over four more weeks; one would assume, though, that 10 weeks should be sufficient time to see some level of impact by the last regular exam, and this did not occur. Third, the class sizes were small, with the greatest number of students in a single section at 21; one may reason that if class sizes were larger, or if there were more sections to include in this study, that maybe significant differences between students receiving SRL activities and those who comprised the comparison group(s) would be found. However, many of the One-Way ANOVA results comparing the critical thinking assessments for the SRL and comparison students were not remotely close to significance, so it is doubtful that even doubling the sample size would have made a difference in this study.

From this study, we can conclude that we may want to try to encourage internal motivation as we provide course content in the hopes that our students will then develop deeper critical thinking skills. But how do we do this? For each class, I start the quarter with

an opening day pep talk, highlighting some of the more exciting topics we will cover in the course, the types of activities we will be doing, and the need for them to realize that what they get out of my course is heavily based on the attitude and effort they bring into the classroom. As an educator, I already have a passion for learning, so it is difficult for me to determine what else I could be doing to stoke that passion that first day of class while at the same time reminding them of the role that they play in the course. It can be difficult for some students to understand that college is an opportunity to learn beyond what is required for a job – it is an opportunity to learn how to think critically about what is happening in the world and to use those skills to solve greater problems beyond paying one's bills. Finding ways to increase internal motivation for learning while using students' existing external motivation factors to maximize critical thinking skills may seem daunting, but is a task we must tackle for the intellectual growth of our students.

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Being Agile in Computer Science Classrooms

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Abstract

Technical excellence and good design of students' deliverables are what a Computer Science teacher must achieve in a successful course. We believe that when agile techniques are used in a teaching environment the learning speed and the quality of the material produced by students improves. A first study was conducted at Kent State University at Stark and Ohio University to determine the usefulness of pair programming in the context of refactoring, two core principles of an agile software development technique called eXtreme Programming. A second study was conducted at Kent State University at Stark and Youngstown State University that extends the basic principles of pair programming to pair-learning activities and applies it to Computer Science courses where code writing is not strictly required. Both studies analyze the quality of deliverables produced in the pair programming activity. A post questionnaire was used to gather students' feedback in both experiences. In the second study, a comparison between deliverables produced by pairs versus deliverables produced by singles has been performed. In this paper, we describe our experience in conducting such studies and the benefits/drawbacks of using agile techniques in Computer Science classrooms. The studies show that cooperative learning produces better results than individual learning with answers of better quality produced in a smaller amount of time even though more time is spent in communication.

Introduction

As stated in the ACM Computer Science curriculum 2008 (ACM, 2008) Computer Science education must seek to prepare students for lifelong learning that will enable them to move beyond today's technology to meet the challenges of the future. The Computer Science community recognizes that it is important to identify the

fundamental skills and knowledge that all computing students must possess. Computer Science continues to draw its foundations from a wide variety of disciplines and undergraduate study of Computer Science requires students to utilize concepts from many different fields. Computer Science students must acquire some professional practice through integrated activities such that management, ethics and values, written and oral communication, working as part of a team and remaining current in a rapidly changing discipline. The mastery of the discipline includes not only an understanding of basic subject matter, but also an understanding of the applicability of the concepts to real-world problems (ACM, 2008).

The result is a set of challenging courses that span from the most theoretical to the most practical aspect of the discipline. Particular stress is given to the formation and the improvement of design skills and problem solving abilities, team work to recognize the importance of abstraction, and to appreciate the value of good engineering design. All this is accompanied by an ongoing activity that shapes programming skills. In order to reach these goals a good curriculum is set in place by the university but it is in the classroom that the accomplishment of such goals are obtained through continuous activities that are designed to support and acquire such skills.

Learning is as an ongoing process and technical excellence and good design acquisition must be part of the ongoing process in a Computer Science curriculum. This excellence and quality of design must be present and shown in every student deliverable. Appropriate teaching techniques must be set in place to achieve such goals. Such techniques must help the student to achieve high quality work within the deadline according to the requirements and the specifications provided by the teacher. In other words "are there techniques that can be set in place while teaching Computer Science that improve the quality of material produced by the students?"

We believe that when agile techniques (Aydin et al. 2004) are used in a teaching environment the learning speed and the quality of the material produced by the students improve. Moreover, involving Computer Science students in an agile process would prepare them for the real world where agile processes are used in software development,

as well as in business and manufacturing (Cao, 2003). Such techniques could be used in any Computer Science course, courses where programming is required as well as in courses where more computational thinking (Wing, 2006) is required.

Pair programming and refactoring are both core principles of eXtreme Programming (XP) (Conboy et al. 2010), an agile software development technique. Pair programming (Williams et al. 2003) is a process where two programmers, a driver and a tactician, synergistically work towards the solution. Refactoring (Fowler, 1999; Martin, 2009) is the process of improving the design of code without changing the functionality. A study was conducted at Kent State University at Stark and Ohio University to determine the usefulness of pair programming in the context of refactoring. Twenty students, both CS undergraduates and graduate, participated in the study. The study was split into two parts: pair programming and individual programming. The goal of the individual programming section was to determine each student's level of expertise with programming and design. A post questionnaire gathered feedback from the students. A second experiment was conducted at Kent State University at Stark and Youngstown State University with an activity that required computational thinking. The same activity was given to a sample of forty students, all taking Computer Science classes at several levels. Some students worked in a pair, while others worked individually. The goal was to identify the quality of the work in a pair with respect to the quality of the work done individually. A post questionnaire was used to gather feedback from the students about the experience.

The paper is organized as follows. In Section 2 we describe the agile software development process and the metaphor that has inspired the use of agile techniques in Computer Science classrooms. In Section 3 we describe the agile techniques that have been used experimentally in the Computer Science classroom. In Section 4 we describe the two studies performed to test the benefits obtained from the application of such techniques. Finally in Section 5 we present our results and the conclusions.

The Agile Metaphor

Agile Computing is a new computing paradigm designed to overcome the needs of modern-day system software development. The word agile refers to something that is fast to adapt, extremely flexible and quick in movement. In the area of Software Engineering, research has created efficient tools and methods for the software development that increase the production of software systems while maintaining high quality standards. Tools such as the Unified Modeling Language (UML) (Booch et al. 1999) have been used to help engineers in the design of software systems, and development methods such as structured methods, object-oriented approach, refactoring, etc., have been used to produce software that is more flexible and stands the continuous changes produced by the dynamic set of requirements. The principles behind the Agile Manifesto (Beck et al. 2001) point the attention towards "individuals and their interactions" over processes and tools, "Working software" over comprehensive documentation, "Customer collaboration" over contract negotiation, and finally "Respond to changes" over following a plan.

Several agile techniques have been created and selected to favor such principles. Pair programming, refactoring, works in team, short stand up daily meeting for quick update and continuous interaction have become core principles and practice of eXtreme Programming (XP), an agile software development technique that fosters the principles of the Agile Manifesto (Beck, 2000; Beck, 2004; Succi, 2001).

We believe that in the classroom, teachers and students face some of the same difficulties that software engineers and customers face while developing software in the real world. In agile software development, small teams of engineers produce quick executable deliverables that satisfy the customers' requests; in the teaching and learning environment, students are required to produce a set of deliverables (i.e. solution to problems, completion of homework, small programs, etc.) to satisfy the teacher's request. In the teaching and learning environment the students represent the engineers and the teacher represents the customer. We do understand that the role of the teacher is slightly different from the role of the customer in

the software development environment since the teacher represents the expert or the coach of the team while typically in the software development environment the customer is neither the expert nor the coach of the team however, as the customer, it is this person that must be satisfied. This is not a problem since this role is typically assigned to a team manager or team leader which instructs the team and acts as a liaison between the customer and the team. To be precise, both the team manager and the customer cover the role of the teacher in the metaphor. For simplicity we refer to the teacher simply as the customer.

As the customer, the teacher provides requirements to the students; the student interacts with the teacher for clarifications of the requirements, the problem specifications and for possible changes of such requirements. Then the students design and implement the solution that is later delivered to the teacher. In some cases, as in the case of class project developments, the teacher returns the material to the students with feedback that forces the students to adapt or rethink the produced material to create new deliverables. As in the case of the software development, high quality of the deliverables is expected and adaptability of the material produced increases the chance to produce the deliverable within the deadlines. For example, if during a project a student is collecting and printing large amount of material, it would be wise to modularize the collection of the material (i.e. in chapters, in sections, etc.) and avoid page numeration in order to be able to add the last minute additional material in place without reorganizing the whole collection.

The agile process is geared towards the satisfaction of the customer which becomes the success of the team or the company, the teaching process is geared towards the satisfaction of requirements set forth by the teacher which becomes the success of the student.

While pondering at these similarities we have asked ourselves: can we increase the learning speed and quality of material produced by students by using agile techniques in a teaching environment? In agile software development, good time management together with agile techniques is a good recipe for success. Therefore we wanted to demonstrate that in the teaching environment, good time management

together with some agile teaching techniques is a good recipe for the success of a course.

In order to test our hypothesis, we designed and conducted two experiments at three different universities and at different levels of student expertise.

Agile Techniques

In this section, we present related work with respect to agile techniques and in particular pair programming. Both pair programming and refactoring are core principles of eXtreme Programming (XP) (Conboy et al. 2010), an agile software development technique. A brief description of refactoring is also given.

Pair Programming

Pair programming is gaining more and more interest as a tool that helps build better software and develop it in a more efficient and more agile manner (Coman, Sillitti, and Succi, 2008).

An interesting article by Wray (Wray, 2010) explains how pair programming really works. Pair programming is a process where two programmers, a driver and a navigator (Williams, 2003), synergistically work towards a solution. Williams specifies that the driver controls the keyboard and focuses on the task of coding while the navigator observes and reviews the work of the driver and focuses more on the strategic architectural issues.

In reality in pair programming, there is more communication during the work than what is indicated by Williams (Wray, 2010). Both programmers tend to work closely together by reminding each other about things to do, by highlighting pieces of code that are in discussion, and by brainstorming the whole time. Both programmers take turns at the keyboard exchanging roles frequently. A video analysis performed by Höfer (Höfer, 2008) also adds that most pairs do not share the keyboard and mouse equally but rather have one partner who is more active than the other.

Bryant et al. (Bryant, Romero, and du Boulay, 2008) suggests that a key factor in the success of pair programming may be the associated increase in talk at an intermediate level of abstraction.

Studies have demonstrated pair programming is very beneficial since:

- Both developers are fully aware of the code, how it works, and why it was done that way, therefore when a change is later required more than one person is familiar with the code.
- Code is less likely to contain bugs and hacks and things that cause maintenance problems later.
- It gets developers talking and communicating ideas in the common language of code.
- Code gets written quicker.
- It helps create code that often doesn't require revisiting.

If pair programming is beneficial, it is also controversial (Williams, 1999). People either love it or hate it. Velasco explains that the creative process is short-circuited during pair programming. Instead of letting one's mind digest the problem in due time, pair programming puts pressure on people to arrive at a solution more quickly (Velasco, 2006). The students' attitude (Hanks 06) and the personality dimensions in the pair have also been source of concern and agreeableness, conscientiousness, neuroticism, and openness have been investigated (Sfetsos & et al., 2009; Salleh, Mendes & Grundy, 2010). The benefits of the use of pair programming in an educational environment have been highlighted in (Dybå & et al., 2007; McDowell et al. 2006).

We are aware of experiments for the use of pair programming conducted in an academic environment (Nappagan & et al., 2003; Williams, 2007; McDowell, Hanks & Werner, 2003; Matzo, Davis, 2006; Mendes, Al-Fakhri & Luxton-Reilly, 2006). However in those studies pair programming has been used exclusively in courses which involve solely writing code; for example courses such as Software Engineering, Computer Science I or II, Introduction to Computer Science. While this seems to be the most natural approach we believe that the pair programming technique can be extended to the rest of the Computer Science classrooms as a collaborative learning technique where pure programming activity can be replaced by computational thinking (Wing, 2006) activities or learn-by-example activities.

Refactoring

Refactoring is the process of improving the design of code without changing the functionality (Fowler, 1999; Martin, 2009). Problems in the low quality of code can be addressed by refactoring the source code. Clean code is both maintainable and extensible, which are two benefits that are essential for high quality code.

The process of refactoring is performed via an iterative process that analyzes each section of the code and applies the selected refactoring rules. Such rules perform minimal changes in the structure of the code but do not change its functionality. In the end the refactored code is easy to read, well-organized, modularized, and documented. Together with pair programming, refactoring is used in the agile process of software development, which allows for improving the quality of code produced.

The Experiments

This paper presents two experiments conducted across three universities in Ohio. We now present details of each experiment along with the results derived from them.

The Refactoring Experiment

The first experiment named the Refactoring Experiment was conducted at Ohio University and Kent State University at Stark to determine the usefulness of pair programming in the context of refactoring. Ten pairs of students, both CS undergraduates and graduates, participated in the study. The study was split into two parts: pair programming and individual programming. The goal of the individual programming section was to determine each student's level of expertise with programming and design. The study was given to students enrolled in both high level (software engineering) and low level (CS2) courses. Refactoring is a very common activity since most of the time developers' work with existing code. This experiment tries to determine the effects of pair programming in the context of refactoring on student's productivity and knowledge gained.

The pair programming part was conducted over two lab sessions. The system used was a Video store that keeps track of movies

rented by customers. It consisted of 5 classes, 2 test cases, a makefile and a readme on how to build the system. Out of the 8 questions, five of them were on code refactoring. See Table 1 for the types of refactorings asked. As an example, the exact text of the Replace Temp with Query refactoring asked in Question 4 is presented below.

> Question 4: Loops that do more than one thing at a time are more difficult to comprehend and extend in the future. The loop in method statement is performing multiple duties; including accumulating the total charge for all movies. Perform a Replace Temp with Query refactoring to eliminate the variable totalAmount by creating a private method getTotalCharge in class Customer. Use a call to this new method where totalAmount is being output

Question 1	Draw an initial UML class diagram
Question 2	Write a unit test
Question 3	Extract method refactoring
Question 4	Replace temp with query refactoring
Question 5	Move method refactoring
Question 6	Replace type code with state/strategy refactoring-I
Question 7	Replace type code with state/strategy refactoring-II
Question 8	Draw the final UML class diagram

Table 1. Question Types from the first experiment

The second part was the individual programming part where we wanted to assess each participants general coding ability with a somewhat easier problem than the one given to them in part one above. There were two questions to the second part. The first question asked to write a program in a language of their choice, to calculate the gcd (the greatest common divisor also known as the greatest common factor (gcf)) of two numbers. The algorithm was given to them. The second question gave them the requirements of a user defined stack class, and asked them to write pseudocode for four methods namely; push, pop, isEmpty and isFull. The individual part of the experiment

was done immediately after the second lab session after the students were done with the pair programming gcd part.

There were 10 software engineering OU students and 7 CS2 KSU students that participated. Out of these eight pairs were randomly formed. There was one student from KSU that did not participate in the pair exercise.

Two teams from the software engineering class at Ohio University completed all 8 questions with almost 95% accuracy. After looking through the post questionnaires and the individual exercises for these subjects it was found that there was at least one individual in these teams who was very well versed in programming. However, even these individuals who were at a higher ability level confessed that their partner really helped them in achieving their goal faster. For instance one student mentioned how their partner remembered a lot of things about C++ inheritance that he had forgotten and reminded him to fix up the header files when he changed the cpp file.

One student commented: "I forgot the virtual keyword before the function in price. I learnt from my partner how to declare virtual functions". Another student stated "Pointers are evil, very tricky to use the pointers as needed". The majority of students said they learnt something new from their pair programming session or that the partner helped them in recalling something they had forgotten.

Another theme that emerges from this exercise is that students get to know their fellow students more and eventually interact more in class. For example one student mentioned that he didn't know his partner too well but after doing this exercise, he found he was a very competent partner to have.

With respect to completion, four groups completed the entire assignment. Two groups completed half of the assignment. Two groups only got past 3 of 8 questions. Nearly 88% (15 out of 17) students thought that solving each question together required less time. The majority of students agreed that this exercise would not have been faster alone as it would have taken them a lot longer to track down bugs. Pair programming was very welcomed in the software engineering class and the CS2 class (with two exceptions).

Note that in the refactoring experiment, we did not attempt to

compare the effects of doing the refactoring exercise (part one) with the individual exercise (part two). They are not comparable since the individual exercise was a lot easier than the pair programming one. Here, we merely wanted to gather student observations while they were part of this pair programming exercise. The individual exercise acted like a test to make sure we had a good balance of programming experience in the teams, which we did. We also concluded that the refactoring problem was a hard problem to give the lower level classes. It required some understanding of the concept as well as a general idea of UML class diagrams (Booch 1999) to go about doing the task. This could be one of the reasons why a lot of pairs did not fully complete the study. Those who fully or partially completed it were part of the Software Engineering class.

The experiment described in the next section which is conducted as a between-subjects design, does a direct comparison between pairs and individuals and is described in detail.

The Hailstone Sequence Experiment

Encouraged by the results of the first study, we wanted to extend the pair programming technique to other Computer Science classrooms as a collaborative learning technique where the pure programming activity can be replaced by computational thinking activities or learn-by-example activities.

The second experiment was designed to focus on the analytical and computational thinking of the students and it required analyzing the "hailstone sequence" and answering 5 questions. The hailstone sequence starts with any positive integer and produces the next number in the sequence in the following way: if the number is odd, then multiply it by 3 and add 1; otherwise, divide it by 2. It is conjectured that, no matter what positive integer you start with, the hailstone sequence eventually reaches the pattern 4-2-1. This conjecture has yet to be proven. An algorithm in pseudocode for the generation of the hailstone sequence was given.

See Table 2 for the questions asked in the experiment. The first 3 questions were designed to observe the behavior of the sequence. For example, Question 3 asked to "identify a starting number for which the

hailstone sequence is at least 30 numbers long, to compute the length of that sequence, and to observe how long are the hailstone sequences associated with the new starting number if 1 is added and subtracted from that starting number." Question 4 was designed to identify the ability to apply specific knowledge in a more a general context. Finally question 5 was designed to observe computational thinking ability. Students in that question had to write an algorithm in pseudocode, similar to the one provided for the hailstone sequence. The algorithm had to generate any sequence that alternates odd and even numbers.

Question 1	What is the smallest starting number that generates a hailstone sequence with a length of at least 15?
Question 2	Identify a starting number for which the hailstone sequence is at least 30 numbers long. What is the length of the sequence? If you add and subtract 1 from this starting number, how long are the hailstone sequences associated with the new starting numbers?
Question 3	What is the length of the hailstone starting at 100? Starting at 200? Starting at 400?
Question 4	In general if the hailstone sequence starting at some number N has length L, how long would the hailstone sequence starting at 2N be? Explain your reasoning.
Question 5	Can you write an algorithm in pseudocode similar to the one you have seen for the hailstone sequence for the generation of an infinite sequence that starts at any given number and alternates an even number with an odd number? (NOTE: There are many possible sequences that can be generated. Write an algorithm that is generic. The only requirement for the sequence is that the numbers must alternate odd and even numbers.)

Table 2. Questions from the second experiment

As it can be observed, with the exception of writing a small

algorithm in pseudocode there was no coding involved in this experiment as we would expect in other activities of Computer Science course beyond pure programming. A web page that contained the hailstone sequence generator was given to the students. The page was used during the experiment for the observation of the sequence's behavior.

Forty-five students participated in the experiment, both undergraduate and graduate across at Kent State University at Stark, and Youngstown State University. Students were selected in introductory courses of Computer Science (Intro to CS and Intro to Web Interface Design) as well as in higher level courses (Computer Architecture and Software Engineering). Of the forty-five students involved in the experiment, fifteen worked individually and fifteen worked in pairs. Only one computer was available for each pair. Each student in the pair had to act alternatively as driver or navigator, and they had to exchange their roles at the beginning of each question. The role of the driver was to use the keyboard and to interact with the program. The navigator, on the other hand acted as a second pilot, observed the driver and engaged in discussion by proposing alternative paths or solutions, by correcting mistakes, or by guiding the driver throughout the activity. The students were asked to spend up to 4 minutes for each question. They timed themselves on paper for each question, reported their difficulty and confidence level in a small table and move on to the next question.

The answers to the experiment were graded as correct or incorrect and no partial credits were given. Therefore even a small mistake would make the answer incorrect. While this option would cut dramatically the number of accepted answers, it will help us to observe only the answers of best quality.

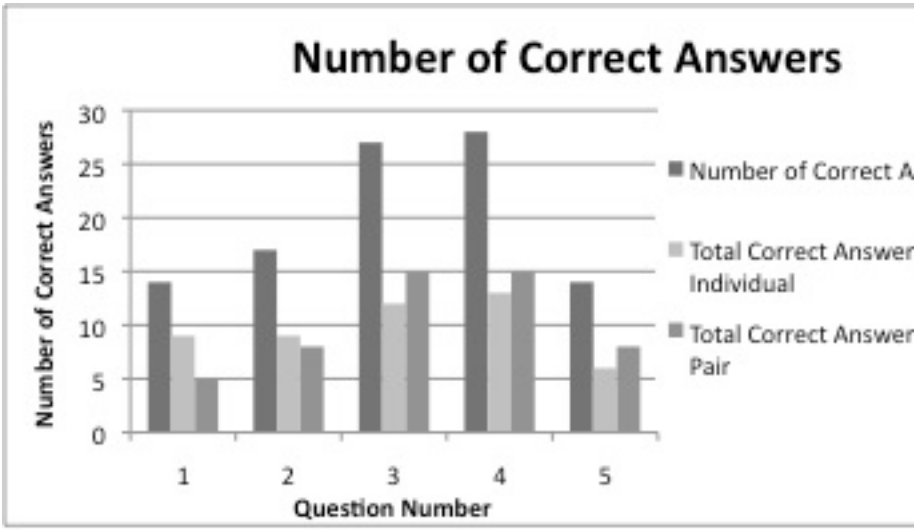

Figure 1. The total number of correct answers

As we can see in Figure 1, with the exception of questions 1 and 2, the total number of correct answers is greater in a pair than individually. We believe that this due to the fact that the pair at the beginning had to establish a pattern of communication thus reducing the amount of time that would be spent in producing the correct answer. After the first training attempt in question 1 we see this training gap reducing in question 2 and it definitely disappears in all the remaining questions.

If we observe the degree of difficulty perceived by each student per question we see that question 2 together with question 5 was considered among the most difficult questions. This makes us think that it is possible that the training gap would already have been filled if an easier question had been encountered at the beginning of the experiment.

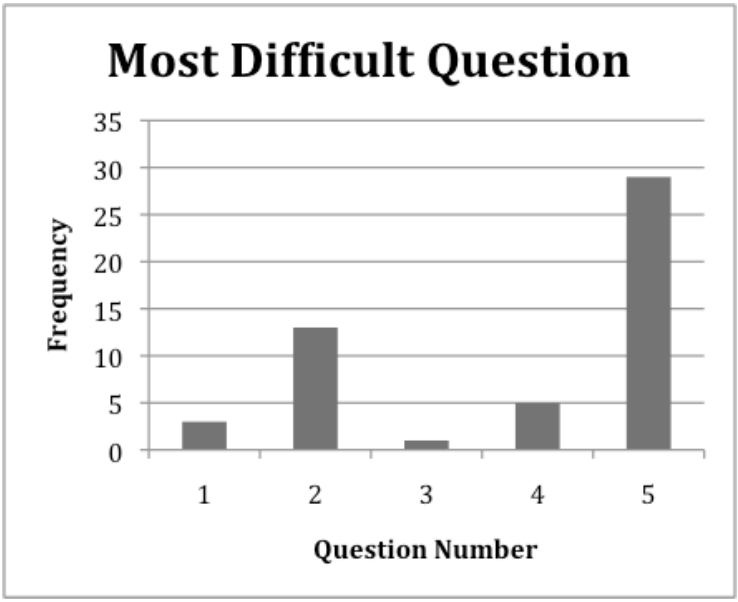

Figure 2. Degree of difficulty per question

The results also show that pairs produce quality results in less time than singles as it can be seen in figure 3, even though more communication is involved during their activity.

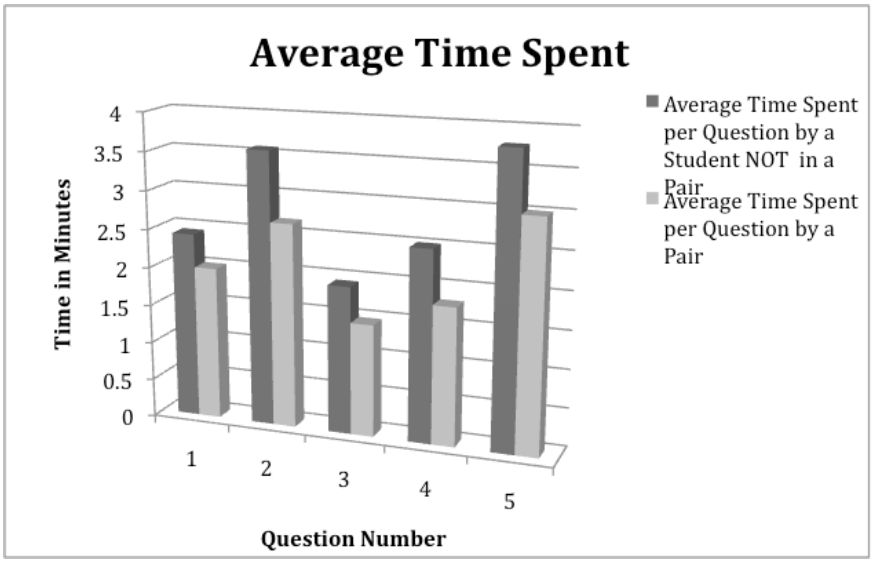

Figure 3. Average time spent per question by pairs vs. individuals

The students' comments collected in a post questionnaire indicate that the majority of the students who worked in pair thought that the experience was beneficial. Some comments related to the question "Did you feel the pair programming environment helped you in this assignment?" are given below.

- "Yes working with another person helped us to figure out how to answer the questions"
- "Yes, we tend to complement each other"
- "Yes, reassurance and quicker work."
- "Yes, because I'm lost and he helped explain"

Only three students (out of forty-five) commented that pairing was slowing them down or that they didn't think they received any benefit from it. Here are their comments:

- "No I don't work well with other people and I felt my partner was holding me back."
- "It would be if we were both at the same level of programming."

- "Working in a pair had no effect on the difficulty of the assignment."

A successful learning experience is also one that prepares the students for the real world. We believe that involving students in an agile process during their academic work, not only increases the students' success, as this study shows, but it exposes them to some of the practices in use in the job market. In the software development environment, where agile processes are in place, team cooperation and pair programming are vital.

Conclusions and Future Research

Producing deliverables of high quality is what both teachers and students should try to achieve. In this paper, we show that when agile techniques are used in Computer Science classrooms, the quality of the work produced by students greatly improves.

Two experimental studies have been conducted with a total of forty-five undergraduate and graduate students. The first experiment used pair programming in the context of refactoring and was performed in courses such as Software Engineering and Computer Science II. In this experiment we observed and compared the success level reached by the student in the classroom after pair programming and individual programming was performed. Another theme that emerged from this exercise was that students got to know their fellow students more and eventually this created a more interactive class.

In the second experiment we extended the pair programming technique to other Computer Science classrooms as a collaborative learning technique. In the extension, the pure programming activity was replaced by computational thinking activities or learn-by-example activities. The study performed a comparison between deliverables produced by individuals working in pairs versus deliverables produced by singles and showed that cooperative learning produces better results than individual learning. Answers of better quality were produced in cooperative learning in a smaller amount of time even though more time was spent in communication especially at the beginning of the exercise when both the interaction and the protocol of communication

had to be established.

While these results are encouraging, we are aware that there are still open problems to examine. For example, is cooperative learning more effective in lower-level courses or in upper-level courses? Which technique can be added to cooperative learning to identify the participation and effective learning of each member of the team? How much is the formation of pairs reflected in the outcome? It is our intention to explore these questions and other related questions in our future research.

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Incorporating Disability Studies into the Composition Classroom

Hayley Mitchell Haugen, Ohio University-Southern

I structure my junior level composition course, Women and Writing, at Ohio University Southern almost entirely around contemporary autobiographical works by women writers with chronic illnesses and/or disabilities. As part of my own on-going critical research, I argue that literature about illness and disability is becoming an important sub-genre of American literature. Memoirs by ill and disabled writers began to emerge in increasing numbers in the 1980s, a trend that has not only continued, but has flourished since the 1990s in particular. This boom in disability literature coincided with increased activities within the disability rights movement and the passage of the Americans with Disabilities Act in 1990. Leonard Kriegel, Nancy Mairs, Kenny Fries, Lucy Grealy, William Styron, Lauren Slater, Andre Dubus . . . the list of American writers publishing critically acclaimed memoirs of illness and disability since the 1980s goes on and on.

While it is true that autobiography *alone* cannot change cultural understandings of disability experience, I argue that first-person narratives of illness and disability do play an important role in making people with illnesses and disabilities more visible in a society that has traditionally marginalized their existence. In the narratives my students read in my classes, I particularly draw attention to the ways in which ill and disabled authors control the representation of *themselves* in their works.

Contemporary American memoirist Nancy Mairs is just one disabled author my students encounter in my Women and Writing course. Mairs writes as a first-person, singular narrator, and by this I mean that her work focuses on her own, very individual experiences and not the experiences of people with disabilities as a group. In Mairs' work, however, one sees that she is fully aware of the social consequences of the social construction of her medical condition, which happens to be multiple sclerosis. Through

exposing herself through writing about her personal experiences as a disabled woman, Mairs becomes visible within American culture. She understands this, not only as a goal, but as a responsibility of her work. Indeed, for Mairs, the essay has become her vehicle for political engagement with American culture, and the means through which she insists on visibility and representation for all disabled women and men within our society. Mairs' memoirs, and others like hers, not only serve as a voice that helps further the goals of the disability rights movement, they also represent a personal identity behind an emerging canon of American literature.

In my junior composition course, I engage my students in the usual activities to meet the course outcomes in terms of writing, reading, and thinking processes. As in any composition course, my students gain experience writing informal response papers, writing formal essays, doing peer critiques, revising their own work, reading actively, and working in groups as a means to becoming successful writers and thinkers both within and outside of the university. Through our focused readings, however, I also encourage my students to become cognizant of the social construction of illness and disability in American culture. Just a few of the other authors and works I build the course around include Lucy Grealy's *Autobiography of a Face*; Margaret Edson's play, *Wit*; poetry selections from Sharon Olds' *The Gold Cell* and *The Father*; excerpts from Audre Lorde's *Cancer Journals*; and excerpts from Lauren Slater's *Prozac Diary* and *Lying: A Metaphorical Memoir.* In reading these works, my students are exposed to a genre of American writing with which they are generally unfamiliar. Through their writing projects, my students are afforded an opportunity to explore the role of disability and illness in their own lives and to add their own voices to this ongoing and burgeoning conversation in our culture.

The Disabled Woman Writer in the Classroom

Susannah Mintz argues that when Mairs writes about her disabled body, she shows "it is simply one more form of human corporeality, but at the same time it might also serve as a liberating metaphor – for multiple perspectives, for resistance to oppression, for a way of making difference radically visible, not merely to reinscribe the 'nor-

mal' body, but as and in itself" (Mintz 265). When educators showcase this kind of radical difference in the classroom, they have the potential to participate in what Rosemarie Garland Thomson describes as "academic activism," a "methodology of intellectual tolerance" (Thomson 99).

In her contribution to the co-written essay, "Becoming Visible: Lessons in Disability," Barbara A. Heifferon argues the benefits of using disability-focused texts such as Mairs' essay, "Carnal Acts," in the composition classroom. Mairs' work, Heifferon says, has the power to "disrupt societal taboos about what is or is not acceptable coping strategy and can also resist conventional binaries regarding perfect/imperfect bodies" (Brueggemann 372). In an attempt to "debunk concepts of 'normalcy' and 'ideal bodies,'" Heifferon adopted Mairs' text for her composition course. Her students' reactions are worth mentioning here, to illustrate the gendered response to Mairs' writing.

In "Carnal Acts," as Heifferon reminds us, Mairs notes that she is unable to speak politely about the body as a woman who has experienced childbirth, physical love, disease and disability. Indeed, she has come to view her own writing about these intimate experiences as carnal acts, each of which, Heifferon says, "confronts issues such as disability labels, stereotyping, and cultural biases toward the differently abled body" (383). In particular, "Carnal Acts," is Mairs' response to a group of women at a small liberal arts college who have invited her to speak on how she "copes" with her disability and how she found her "voice as a writer." Mairs admits in the essay that the most difficult aspect of adjusting to her disease is that it "rammed my 'self' straight back into the body I had been trained to believe it could, through high-minded acts and aspirations, rise above" (Mairs *Carnal* 84). Unable to "rise above" her body in the "Western tradition of distinguishing the body from the mind" (85), Mairs feels the shame of her body all the more. "A woman's body," she writes, "is particularly suspect, since so much of it is in fact hidden, dark, secret, carried about on the inside, where, even with the aid of a speculum, one can never perceive all of it in the plain light of day, a graspable whole" (86). Mairs notes that as a "cultural woman" she cannot escape these feelings of shame: "I bear just as much shame as any woman

for my dark, enfolded secrets. Let the word for my external genitals tell the tale: my pudendum, from the Latin infinitive meaning 'to be ashamed'" (86). In speaking of the shame she feels for her body, Mairs proves that her disability does not make her immune to the gaze of an American culture that views women with suspicion. Indeed, she notes that because of her disability society renders her "doubly other, not merely by the homo-sexual standards of patriarchal culture but by the standards of physical desirability erected for every body in our world" (86). Although she must contend with feeling doubly other, Mairs argues she does cope with her disability most of the time through speaking about it. She has found her "antidote to shame" (91)

> by speaking about it, and about the whole experience of being a body, specifically a female body, out loud, in a clear, level tone that drowns out the frantic whispers of my mother, my grandmothers, all the other trainers of wayward childish tongues: "Sssh! Sssh! Nice girls don't talk like that. Don't mention sweat. Don't mention menstrual blood. Don't ask what your grandfather does on his business trips. Don't laugh so loud. You sound like a loon. Keep your voice down. Don't tell. Don't tell. Don't tell." (91)

Mairs, of course, does tell, and Heifferon describes her students' differing reactions to this intimate rendering of her body and her experience. "The young women in the class were clearly moved by Mairs' words and were sympathetic and emphatic," Heifferon writes, but the "young male students were outraged, not just 'grossed out' by descriptions of body functions and other things that go awry in MS, but angry, furious, livid in the classroom" (Heifferon 383).

As Heifferon's university's composition program calls for a "hands off" approach to presenting the reading material for the program-wide final, she was unable to *teach* Mairs' essay to her students. She reports that she did find it necessary, however, to encourage her students to rhetorically analyze their own in-class reactions to the piece. What was it about the topic of disability, she asked them, that caused the women in the class to respond with sympathy and the men with anger? (384). Later, when reading her

students' written responses on the final, she surmised that her male students had been "outraged at the schism between the idealized body image of women they see projected in the culture and the body image Mairs wrote about," and they were "equally outraged by her admission of self-doubt, weakness, and disability" (384).

Mairs' essay certainly shatters the male fantasy image of women perpetuated by the media which, Heifferon writes, "offers no alternatives to the Barbie doll ideal, a totalizing gesture that wipes difference from our cultural map" (385). Indeed, Mairs' response to our culture's construction of the ideal woman informs much of her work. In her critically acclaimed essay, "On Being a Cripple," in her first collection, *Plaintext*, for example, Mairs explains that she sometimes suffers bouts of self-loathing for being a cripple. It is not the physical limitations that her disability creates that cause this self-hate, however; it is, she says, for not being able to live up to ideal standards of beauty. "Physical imperfection, even freed of moral disapprobation [society used to equate deformity and disease with evil, Mairs reminds us], still defies and violates the ideal, especially for women, whose confinement in their bodies as objects of desire is far from over" (16). Though the ideal has changed through the ages, Mairs notes, the ideal woman "is never a cripple" (16). Mairs admits, "when I think about how my body must look to others, especially to men, to whom I have been trained to display myself, I feel ludicrous, even loathsome" (17), but despite these feelings, she knows that at the center of these feelings is her hate not for herself, but for her disease, and "I am not a disease," she stresses. "And a disease is not – at least not single-handedly – going to determine who I am, though at first it seems to be going to" (17).

While Mairs does not allow her disease to define her, she does admit to being forced by her disability to embrace herself in the flesh (Mairs *Carnal* 96). The result of this, she says, is that she is unable to write "bodiless prose." Her voice, she says, "is the creature of the body that produces it:"

> I speak as a crippled woman. At the same time, in the utterance I redeem both "cripple" and "woman" from the shameful silences by which I have often

> felt surrounded, contained, set apart; I give myself permission to live openly among others, to reach out for them, stroke them with fingers and sighs. No body, no voice; no voice, no body. That's what I know in my bones. (96)

In refusing to be defined solely by her disease, and by refusing to write bodiless prose, Mairs strives to 'normalize' the disabled body in collections such as *Plaintext* and *Carnal Acts,* and it is perhaps this act of normalizing, this refusal to remain invisible, that makes Heifferon's male students initially uncomfortable. As Mintz notes, Mairs' rendering of the body not only makes it recognizable by the dominant culture, it also provides a model for other people living with illness of disability. "Mairs's essays thus proceed as a series of dislocations, which invite but also refuse identification, which insist on the ordinariness of her daily life but never neglect to attend to its constructedness as 'other' (Mintz 256). Heifferon's students clearly react to these dislocations along gender lines, the women feeling invited into her work, the men refusing identification with it. Heifferon suggests that in addition to buying into images of women perpetuated by the American media, many of her young male students react to Mairs negatively because they have formed their own "identities based on their own strong, healthy bodies, and because they are young and abled, their initial response to a disabled woman's body is an angry one" (Brueggemann 385). As Mintz aptly describes, however, to read Mairs is to ultimately "witness the extraordinary ordinariness of the body – all bodies, any body" (Mintz 269), and once Heifferon's male students recognize this fact, they are able to move beyond their initial angry response to Mairs' work in their reflections on her essay for their final paper.

One student whom Heifferon offers up as an example realizes that the initial anger he feels over Mairs' admitting the trouble she sometimes has with coping with her disorder stems more from his own submerged feelings about his father's death than feelings about Mairs herself. In the essay, Mairs claims, as noted above, that through speaking and writing about her disability she has finally been able to

cope with it. And this admission, Heifferon says, helps her own student cope with his father's death through writing. He writes:

> For me speaking about my father's passing would be too traumatic right now. Until this semester I'd never even written about it, but now I'm glad that I finally did. I found solace in writing about my dad, and when I was through writing about his death, I felt as though a weight had been lifted off of my shoulders. (Heifferon 386)

Like Mairs, Heifferon says, this student finds that "bringing the unspeakable to the foreground helped him to understand that he did not need to embrace the idealized model of masculinity (strong, silent type) along with the idealized model of femininity. Instead, the disability text opened up an opportunity for him to express his own grief and loss" (368).

By deepening feminist thought through the complication of disability analysis in the classroom, Thomson explains, one learns to develop a methodology which tolerates internal conflict and contradiction:

> This method asks difficult questions, but accepts provisional answers. This method recognizes the power of identity, at the same time that it reveals identity as a fiction. This method both seeks equality and it claims difference. This method allows us to teach with authority at the same time that we reject notions of pedagogical mastery. This method establishes institutional presences even while it acknowledges the limitations of institutions. This method validates the personal but implements disinterested inquiry. This method both writes new stories and recovers traditional ones (99).

Mairs' essays, by their very nature, require the type of methodological analysis Thomson describes above. And successful analysis of disability along these lines has the power to more fully integrate the sociopolitical world, Thomson adds, for "as with gender, race, sexuality, and class: to understand how disability operates is to understand what it is

to be fully human" (100).

In my own composition classroom, usually populated primarily by female students, my students have, for the most part, reacted positively to the various women authors they encounter throughout the course. Most students admit being unfamiliar with writing by women with illnesses and disabilities, and they often express that the class has afforded them new insights into the world around them. Some students have told me that they enjoy my course, but that they leave it feeling thoroughly depressed. Others have shared their own epiphanies. One student said, for example, that she felt less alone in the shame she felt about her prosthetic index finger (something no one else in the class had even noticed) after she read Lucy Greely and Nancy Mairs. Another wrote about her mother's disabilities and the positive life-lessons she has learned through caring for her; yet another argued against inclusive education for children with severe mental disorders, based on her younger, autistic brother's negative experiences in an inclusive classroom. Last year, one of my non-traditional, returning students wrote that she was inspired by these works' refusal to remain silent on difficult or culturally taboo topics. In response, she wrote an essay on the physical abuse she had recently suffered at the hands of her adult son and her decision to press charges against him.

My students invariably express they didn't know they were *allowed* to write about these topics: illness, disability, personal disaster. In my classroom, they not only discover that a venue for these topics exists in American culture, they also have an opportunity to add their own voices to the ongoing conversation. Whatever responses the readings elicit from my students, the works have something in common beyond their literary merit. Whether they speak through the voice of the autobiographer, are dramatized through the insights of a fictional character, or are expressed in poetry by a semi-autobiographical persona, the women in these works insist on the value of their lives as women with illnesses and disabilities, and in doing so, they gain legitimacy within American culture. Ultimately, my goals are similar to Thomson's in that I hope that my students emerge from this course with the feeling that our discussions of illness and disability in literature (in all genres) are just as important as our discussions of race, class, and

gender, and just as vital to our understanding the human condition.

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Motivating Undergraduates in an Introductory Financial Accounting Class with Stickers!

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Introduction

Financial accounting has historically been perceived by college students as a difficult subject (Shotwell, 1999). At some colleges students from a wide variety of disciplines take financial accounting; therefore, students are not always interested in the subject matter. Shotwell (1999) found that only roughly one third of students enrolled in a financial accounting class are really excited and eager to learn the material. Thus, accounting educators have struggled to find ways to help students master the subject.

One way to help students master a subject is to motivate them to gain this mastery. Students can be intrinsically motivated or extrinsically motivated. Students that are intrinsically motivated do not require external rewards to learn course material whereas students that are extrinsically motivated need external rewards to encourage them to learn the course material (Lei, 2010). If a student is intrinsically motivated he/she will learn the material regardless if the instructor provides additional rewards for learning it. Since not all students are intrinsically motivated, many instructors have researched techniques to motivate and engage students in course material. Extrinsic motivation comes in several forms from in class quizzes to study groups and other techniques in between (Mo, 2011; Hoppe, 2005). This study analyzes the use of a motivational technique developed by the author and used in an undergraduate introductory financial accounting course where the author was the instructor of the course.

Methodology

Business Technology 101T, Financial Accounting, is an introductory financial accounting course that is taken by business and non-business majors at The Ohio State University Agricultural Technical Institute (OSU ATI). Nearly half (48%) of all twenty-nine

programs at the institute require financial accounting. Due to the large number of non-business majors (~75%) enrolled in the course, it draws a wide range of interest in the subject matter. It has also been observed that students struggle in the course. From the author's observations students did not always complete the homework, but the more the students completed the homework the better they did overall in the class. Research has also shown that students generally perform better in class when homework is completed (Bembenutty, 2010). Therefore, as a way to increase student motivation to complete homework assignments and to introduce something "fun" into the classroom, the author developed what she called "Accounting Buckeye Leaves." The objective of "Accounting Buckeye Leaves" was to introduce a motivational technique in the classroom that would accomplish the following:

1. increase overall student homework completion rates,
2. encourage students to work together to learn the course material, and
3. improve overall course grades.

Since OSU ATI is a school within The Ohio State University (OSU), "Accounting Buckeye Leaves" was designed around the "Buckeye Leaves" rewards used by the OSU football team. Football players receive buckeye leaves to display on their helmets each time the team wins. Individual players also receive buckeye leaves if their smaller team (offense, defense, special teams) performs well or if they perform well individually, but only if there is a team victory. This exact philosophy was carried over into the classroom! The accounting class as a whole was seen as the team and from there the students were randomly divided into three smaller teams (offense, defense, and special teams). Every week, with the exception of the first week, each of the smaller teams had to set a goal for what average grade (as a percentage) they wanted to achieve on all of their assignments. Assignments included exams, quizzes, homework, and in-class assignments. The minimum goal that a team could set was 70% and that goal had to increase by a minimum of 0.5% per week. If the team met its goal by receiving an average grade at or above their

stated goal a buckeye leaf would be awarded to each member of that team as long as there was an overall team (class) victory. An overall team victory was achieved when at least 95% of the class turned in their assignments for the week. Ninety-five percent of the class was chosen by the author rather than 100% since occasionally a student will remain enrolled in the class even though he/she does not attend or participate in the class. Another reason for the reduced percentage was to control for unforeseen circumstances that may prevent a student from turning in an assignment. Also, after an individual student missed three assignments he/she was removed from the team so they would not continue to prevent an overall team victory and the awarding of buckeye leaves. There was also an individual component. If an individual averaged an 85% or better on his/her assignments for the week and his/her smaller team reached its goal, that student would receive a buckeye leaf for his/her individual effort. An additional buckeye leaf was also awarded if each smaller team reached its goal for the week. Each week of the quarter, with the exception of the first week, there was an opportunity for four buckeye leaves to be awarded. Once the averages for the week were calculated, an announcement was made in class to report each team's weekly grade as well as the number of earned buckeye leaves. If buckeye leaves were awarded, the author handed out small stickers with a buckeye leaf on it. Over the course of the quarter, 36 buckeye leaves were possible; each buckeye leaf was worth 1 point or 0.5% on the final exam.

Average homework completion rates and grades from three quarters when the author did not use "Accounting Buckeye Leaves" were compared to three quarters when "Accounting Buckeye Leaves" was used. The homework from both with and without "Accounting Buckeye Leaves" was graded for accuracy and the student's homework grade accounted for 15% of his/her overall grade. Student comments about "Accounting Buckeye Leaves" were also analyzed to determine the students' perceptions of "Accounting Buckeye Leaves." Additionally, the author's perceptions of the technique are provided as well as ways it could be improved upon.

In the three quarters that "Accounting Buckeye Leaves" was not used there were five different sections of financial accounting

offered with a total of 123 students enrolled over those three quarters. During the three quarters that "Accounting Buckeye Leaves" was used there were five different sections offered with 133 students enrolled.

Results and Perceptions

Homework Completion Rates and Average Grades

When "Accounting Buckeye Leaves" was not used the average homework completion rate over the three quarters was approximately 80%. The average grade achieved on the homework assignments of all enrolled students was 68%. It should be noted that in two of those sections 28 homework assignments were assigned where in the other three sections there were only 14 homework assignments. If the two sections with the greater number of homework assignments are excluded, the average homework completion rate is approximately 83% and the average homework grade is 66%. These average grades include the students that turned in the assignment as well as those who did not and thus received a zero on the assignment.

In the three quarters in which "Accounting Buckeye Leaves" was used, the average homework completion rate was approximately 90% which represents an increase of 7% to 10% when compared to when "Accounting Buckeye Leaves" was not used. The average homework grade of all students was 74% which is also an increase as compared to when "Accounting Buckeye Leaves" was not used. The author theorized that when implementing "Accounting Buckeye Leaves" the overall course grade would also increase and it did. During the time period that "Accounting Buckeye Leaves" was implemented the final earned course grade increased by approximately 3%. In fact, all average grades in the various graded elements (exam 1, exam 2, quizzes, homework, inclass assignments, and final exam) increased when "Accounting Buckeye Leaves" was used, which can be seen in Table 1.

	Exam 1	Exam 2	Quizzes	Homework	Inclass Assignments
% change	+2.09	+0.77	+5.67	+5.94	+4.82

	Final Exam before Buckeye Leaves included	Final Exam after Buckeye Leaves included	Overall Grade Before Buckeye Leaves included	Overall Grade After Buckeye Leaves included
% change	+0.14	+3.81	+2.75	+3.30

Table 1: Percent change in grades when comparing without "Accounting Buckeye Leaves" to with "Accounting Buckeye Leaves" in Financial Accounting at The Ohio State University Agricultural Technical Institute.

Of all of the graded items, the homework average grade increased the most (~6% increase). As hoped, the students' grades increased.

Student Perceptions

From the author's point of view utilizing "Accounting Buckeye Leaves" was successful in improving student grades, but what did the students think about it? To determine the students' perception of "Accounting Buckeye Leaves" the author collected student feedback through an open ended questionnaire at the end of each quarter. When "Accounting Buckeye Leaves" was used the students were asked if they enjoyed it, if it was motivating to them, if it encouraged them to work with their classmates to learn the material, and if they felt they would have done the same amount of work and received the same grade without participating in "Accounting Buckeye Leaves." The students voluntarily provided the answers to these questions and all answers were anonymous. Of the 133 students enrolled during the three quarters of "Accounting Buckeye Leaves", 111 responses were collected from the feedback questionnaire.

When asked if they enjoyed "Accounting Buckeye Leaves",

49% of the students reported that they did, while 21% gave answers that indicated they somewhat enjoyed it or were indifferent, 19% did not enjoy it, and 12% did not answer. Some of the reasons the students gave for enjoying "Accounting Buckeye Leaves" included that it was motivating, it gave them a sense of accomplishment, and it was fun along with the fact it was extra credit or a reward. Other students did not care for the activity because some of their classmates did not turn in their homework or they simply did not care.

Fifty percent of the students reported that "Accounting Buckeye Leaves" was not motivating. Some of the reasons given were because they felt overall grades were more motivating and that they would have completed the assignments anyway. However, 32% of the students found the technique motivating for a variety of reasons such as that it made the student feel good and provided extra points toward the final.

Another outcome that the author was hoping for was that "Accounting Buckeye Leaves" would encourage students to work together to learn the material. Since the students were broken down into smaller groups where they created weekly team goals, the author thought this would provide a good opportunity for the students to form study groups and work together to achieve their goals. Team development theory recognizes that there are four stages of team development which are forming, storming, norming, and performing. In the forming stage team members get to know one another and begin to establish goals and expectations. During the storming stage conflict usually occurs. Working through the conflict leads to the norming stage when the teams agree upon their goals and how to achieve them and begin to work together. Finally, in the performing stage is where the teams truly work together and see the results of their combined efforts (Tuckman, 1965). However, it was found that students did not seem to capitalize on the opportunity to get together in their groups. When viewing the comments of the students, the majority (58%) of students stated that "Accounting Buckeye Leaves" did not encourage them to work with others. In fact, some students were discouraged by the fact that other students were not turning in their homework which caused them to be unable to receive any buckeye leaves for the week.

The author was disappointed that more students did not work together in teams to learn the material and concluded that the students never got past the forming or norming stage of group development.

Even though the students seemed to at least somewhat enjoy the activity, most (76%) reported that they felt they would have done the same amount of work and earned the same grade regardless of "Accounting Buckeye Leaves". In reality though almost all of the students received at least one buckeye leaf thus their grade did at least improve slightly! Even though the students may not have perceived it as helping their grade, the author feels that it did. Also, looking at the changes in the grades when "Accounting Buckeye Leaves" was used and when it was not, it appears that "Accounting Buckeye Leaves" helped the students.

Instructor Perceptions and Recommendations

Looking back, there are additional items the author could have implemented to make this technique more successful. It has been found that the stronger a group's norms are or in other words the more the group develops shared goals and meets together, the more likely an individual within that group will work toward those goals (Christian et al., 2011). Thus, giving more time during class for the groups to meet and develop a sense of being a team may allow them to progress to the performing stage of group development. Additionally, more encouragement and feedback about the students' progress might further encourage the students to work together. To provide feedback, the author displayed each team's weekly earned average along with the number of earned buckeye leaves on the chalkboard. The stickers for any earned buckeye leaves were given to the students when graded homework was returned to the student. Making the awarding of buckeye leaves more ceremonious may encourage the students further. For example, at the beginning of the week the previous week's team averages could be announced and the students called forward to receive their buckeye leaves. Students receiving a buckeye leaf for their individual performance could be recognized as well. Also, providing the range of average scores for each smaller team would be helpful feedback for the students. This feedback may encourage the

groups to work with one another to increase the average grades or to reach out to group members who are not turning in the assignments.

Through utilizing this technique the author also found that the instructor must be committed to calculating and providing the results in a timely fashion. On a few occasions the author was a bit delayed in providing the weekly averages and perceived that when reported late they had less of an impact on the students. There is a definite time commitment to utilizing this strategy as weekly averages need to be calculated and individual completion rates also must be tracked. However, using a spreadsheet makes this task more manageable.

Summary

Even though this study only examined one particular class in one particular university, the results still provide insight to others. For this class, it was found that homework completion rates, as well as grades, increased when "Accounting Buckeye Leaves" was used. The students did not perceive this activity as overwhelmingly motivating but some did comment that it in fact did motivate them to do more and it was fun. This activity did not really encourage the majority of students to work together to learn the material as the author had hoped. If nothing else, other instructors could implement a similar activity in their classrooms to bring a change of pace to the class. However, if some of the suggestions provided above would be implemented, this technique could prove to be valuable to other instructors as well as motivating to the students while allowing them to learn the course material better.

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How to Teach a True Spokane Story: Learning Sherman Alexie's *Lone Ranger and Tonto Fistfight in Heaven* Through Tim O'Brien's *The Things They Carried*

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Helping students connect with the experience of characters who come from backgrounds other than their own, such as those in Sherman Alexie's *Lone Ranger and Tonto Fistfight in Heaven* can be difficult. Tim O'Brien's *The Things They Carried* presents similar challenges for students since it treats historical events in an innovative formal structure, but at least some students may have parents or relatives who have experienced those historical events. O'Brien's work discusses a war that occurred before "traditional" students were born; Alexie's concern native culture which few students in the lower Midwest such Ohio and Indiana come into any contact with except through popular representations. Further, O'Brien's insistent focus on factual and fictional boundary of his work offers a challenge to students who prefer to take their fiction straight. Alexie's autobiographical stories similarly dance along the fictional/factual divide. The shared formal elements and unexpected connections among their characters make O'Brien a useful work to teach in conjunction with Alexie's.

In *The Things They Carried* Tim O'Brien's narrator (also named "O'Brien") distinguishes between "story-truth" and "happening truth." Story-truth, he says "is sometimes truer than happening truth" (TTC 203). Consequently, "a thing may happen and be a total lie, another thing may not happen and be truer than the truth" (TTC 89). It's a somewhat elusive distinction, but useful in helping students understand a distinguishing characteristic of many contemporary fiction writers and an important element in apprehending all mediated reality, fictional or otherwise, despite its seeming factuality. O'Brien's narrator, like Thomas (and like Alexie and O'Brien) want both "lies and the truth," or the truth that exists in the "lies" they create as authors of stories based on their experiences. In other words, the "lies"

authors tell in stories have their own truth.

Sherman Alexie has always insisted on the fictional aspect of the stories and resented comments by others on their "autobiographical nature," but also admits that he "was full of shit," characterizing "the book . . . [as] a thinly veiled memoir" (LRT xix).[1] A few pages later, though, he reverses himself again, insisting "they're not really true" (xxi). He finishes his account by confessing the story "This Is What It Means When We Say Phoenix AZ" grew from a trip he took with his best friend Steve to recover Steve's father's ashes, though Joseph Arnold in the story more closely resembled Alexie's own father. The story, in part, plays out Alexie's tortured relationship with his own father, celebrating his relationship with his friend's father's kindness to another, orphaned, son and lamenting his sense of abandonment and mistreatment by his own father.

Students can usefully contrast the ways in which O'Brien and Alexie employ their own experience for fictional purposes. O'Brien often focuses on the nature of the transformation itself and openly discusses and displays that transformation. Alexie goes the more conventional route (much like earlier twentieth-century writers such as Ernest Hemingway or Katherine Anne Porter) of mining his own experience growing up on the Coeur d'Alene reservation for his material, yet his portrayals emphasize the historical and personal reality that undergirds them despite the often fantastic events recounted.

Similarly, in Alexie's script for *Smoke Signals* (the film based on his *Lone Ranger and Tonto*) Victor disputes the story Thomas barters for their ride, but the story he tells---that of a war-protesting Native who gets into a fight with the National Guard and is sent to jail as a result even while becoming a celebrated image on the cover of Time magazine--sounds plausible enough, and whatever it may or may not show about Joseph Arnold, it shows the truth of "being an Indian in the twentieth century," the crime Joseph Arnold is ultimately convicted of, according to Thomas. In the film Velma declares it "a

1 I use the accessible recent paperback edition of *Lone Ranger and Tonto Fistfight in Heaven* for reference throughout my essay. Hereafter abbreviated as LRT. Similarly I use O'Brien's most recent paperback edition for *The Things They Carried*, which is abbreviated TTC.

fine example of the oral tradition," which suggests its different claims of authenticity than a printed work that may not be strictly factual.

The formal connections between Alexie's and O'Brien's books is more than coincidental. Exploring the various connections demonstrates how fiction writers respond to other author's work. In his forward to *Lone Ranger and Tonto*, Alexie recounts the early pressures to produce fiction after the success of his first collection of poems, *The Business of Fancy Dancing*: "have you written any fiction?" the agent asks. Alexie responds that he has a "'manuscript of short stories. There must be thirty of forty stories in it.' 'But do you write fiction?'" the publisher continued. "I didn't realize that 'fiction,'" Alexie writes, "was a synonym for 'Sure, we'll publish your book of obscure short stories as long as we can also publish your slightly less obscure first novel as part of a two-book deal'" (xiv-xv). Alexie understood that something more novelistic would be received best by publishers. Unfortunately, he only had fragmentary short stories. O'Brien's *Things They Carried* showed Alexie how short stories could be arranged into a novelistic form.[2] O'Brien's book which had recently been published to great acclaim in 1990, a year or so before Alexie began assembling his short stories into book form, would have been very visible to the young author, especially one alienated from the larger population and who clearly has a wry view of the relationship between factuality and truth, one derived from many years of rewritten and overwritten histories that failed to acknowledge his and his people's presence. *Things They Carried* provided a useful model for Alexie's efforts toward creating a greater sense of cohesion from shorter pieces.

Alexie adapted O'Brien's use of the short story sequence and exploration of story truth vs. happening truth to suit his broader purposes. Alexie's initial description of his stories implies that these stories had no particular arrangement or planned order, but they did

2 One could also point to Amy Tan and Louise Erdrich, of course, but Alexie has never referred to them extensively. On the other hand, he often mentions O'Brien in interviews and even cites him and *The Things They Carried*, as an influence (Weich 174). Just as telling, Alexie has even recorded a reading of "On the Rainy River," one of the stories from TTC. At one time there was even a recording of Alexie reading a passage from O'Brien's "On the Rainy River," but it is no longer available.

present a range of experiences of life on the Coeur d'Alene Spokane reservation. In O'Brien's *Things* Alexie discovered how he could arrange his stories with interconnected characters and location to depict life on the Spokane reservation on which he grew up. He found a form that allowed his various short stories to become more novelistic, less of a collection.[3] Further, he discovered a tone and a perspective that would bridge the gap between his experiences and the larger society.[4]

Even more than in 1990 when O'Brien wrote *The Things They Carried*, the historical gap of the events must be bridged for a younger audience. O'Brien does that for students by overtly problematizing the truth and factuality of the events he recounts. The uncomfortable feeling such boundary play creates inevitably portrays the disturbing feelings engendered by the Vietnam War at the time. "It comes down to gut instinct. A true war story, if truly told, makes the stomach believe" (TTC 74).

Several elements in Sherman Alexie's *Lone Ranger and Tonto Fistfight in Heaven* connect with Tim O'Brien's short story sequence *The Things They Carried*—its unique form, its insistent assertion of "story-truth" over "happening truth," and the alienated and traumatized populations that each author presents. As teachers, we can use these elements to allow the works to help instruct students on the sometimes slippery forms and surprising contents and attitudes in O'Brien's and Alexie's works.

Introducing Native literature presents an additional challenge since students may assume that the problems faced by Native peoples are largely past problems. Alexie's characters and stories assert just the opposite. His solution to crossing the gap between the lives of his

3 The short story sequence is not unique to O'Brien, of course, and the success of Louise Erdrich's *Love Medicine* may have lent further support to Alexie to use such a form. Indeed, some critics have argued that the short story form in general and the short story sequence in particular are "suited to 'submerged population groups' feeling themselves alienated from national norms" (Dix 159).

4 Though the form of a short story sequence was expedient for Alexie, as Rocio Davis notes, the form suited Alexie's purpose of detailing the difficulty of growing up Spokane in a nation that considers the term a designation for a city in Washington state and not for a people (Davis 8).

characters and the likely experience of most of his reader with what he calls "reservation realism." After discussing in his forward to the book the true and fictional elements of various stories ("Phoenix, AZ," "Fun House," "Indian Education," "Witness, Secret and Not"), Alexie insists the stories are "not really true. They are simply the vision of one individual looking at the lives of his family and his entire tribe, so these stories are necessarily biased, incomplete, exaggerated, deluded, and often just plain wrong. But in trying to make them true and real, I am writing what might be called reservation realism" (LRT xxi).

Alexie declines to offer a definition of "reservation realism," inviting the reader instead to "read the book and figure that out for yourself" (LRT xxi). O'Brien's approach to fiction is helpful in explaining Alexie's term. Alexie's contradictory statements about the truth of his fiction resemble Tim O'Brien's similarly contradictory attempts to define how to tell a true war story in the *Things They Carried*. O'Brien asserts that "a thing may happen and be a total lie, another thing may not happen and be truer than the truth" (TTC 89). The difference, the narrator notes later, lies in the fact that "story-truth is sometimes truer than happening truth" (TTC 203). "You can tell a true war story by the questions you ask . . . [if] afterward you ask, 'Is it true?' and if the answer matters, you've got your answer" (83).

Alexie's discussion on the experiential basis for his stories and their truth further mirror O'Brien's convoluted assertions and denials in "Good Form": in that story O'Brien admits only his age at the time of composition and his service during the war. "Almost everything else," he declares, "is invented" (TTC 179). He goes on to explain "this book is written as it is. . . [because] . . . "twenty years ago I watched a man die on a trail near . . . My Khe. I did not kill him. But I was present" (TTC 179). "But listen," O'Brien importunes, "even *that* story is made up. I want you to feel what I felt. I want you to know why story-truth is truer sometimes than happening truth" (TTC 179). Both authors maintain the right to alter their experiences to make us feel their truth and still maintain claims to actuality—if not complete factuality. As Suzy Song in *Smoke Signals* asks Thomas, "Do you want lies or truth?" to which he replies, "I want both."

Alexie's "Because My Father Always Said He Was the

Only Indian Who Saw Jimi Hendrix." embodies the same contested factuality and fictionality of O'Brien's work. Alexie asserts documentary evidence (Time magazine covers, Pulitzers, feature films, etc.) as proof of the story's existence, even as Victor notes the slipperiness of his father's memories. "Somehow," he observes, "my father's memories of my mother grew more beautiful as their relationship became more hostile. By the time the divorce was final, my mother was quite possibly the most beautiful woman who ever lived" (LRT27).

When Victor complains of never having a real war to fight, his father "'That's all there is . . . War and peace with nothing in between. It's always one or the other.' 'You sound like a book,'" Victor says. "'Yeah, well that's how it is. Just because it's in a book doesn't make it not true.'" (LRT 29). Fiction may not be true, his father insists, but that doesn't make it false either.

Later, Victor describes his dreams of his father at Woodstock as Hendrix played "The Star -Spangled Banner," seemingly uncertain of its reality yet noting the rain which he's seen in "actual news footage" and "documentaries" (LRT31). His dreams, however, do nothing to know "what it meant for my father to be the only Indian who saw Jimi Hendrix play at Woodstock," though he acknowledges there may have been "hundreds but my father thought he was the only one" (LRT31). Eventually, Victor complains to his father that "'sometimes you sound like you ain't even real' 'What's real? I ain't interested in what's real. I'm interested in how things should be,'" says his father (LRT 33). Victor admits that "if [his father didn't] like the things you remember, then all you have to do is change the memories. Instead of remembering the bad things, remember what happened immediately before" (LRT 34). The story concludes with Victor dreaming of his father's return. "I knew I was dreaming it all but I let it be real for a moment" (LRT 35). Alexie notes that for any individual the most powerful reality often are those stories they choose to tell themselves.

The alternation of assertion and denial of truth in Alexie follows a pattern similar to O'Brien's narrator's assertions about "The Man He Killed." The first outright telling of the story leaves readers with the impression that "O'Brien" killed the man (as does the title).

He imagines the man's life and what brought him to the point that "O'Brien" kills him. Kiowa tries to explain and to soothe his anguish and odd sense of loss—"You want to trade places with him? . . . . it's *war*" (TTC 126). The notion is reinforced in "Ambush," the story that follows, in which "O'Brien" wants to tell his daughter Kathleen "exactly what happened, or what I remember happening, and then I want to say to her that as a little girl she was absolutely right. This is why I keep writing war stories" (TTC 131).

The formal connections between Alexie's and O'Brien's work, finally, are not so surprising. However, their characters experiences and feelings share unexpected similarlities. Pointing those similarities of experience to students helps them connect to Alexie's likely more distant subject matter. Both the GI's who fought in Vietnam and the Spokane exist in circumstances most Americans are either unaware of or choose to ignore. Just as O'Brien tries to bridge the gap between the readers' understanding and his characters' realities, Alexie tries to explain the confusing circumstances and frustrations of "being an Indian in the twentieth century". Finally, both groups have been under attack and suffered losses; both had been through the war, or in the latter instance, wars (even if now long past), and endured the traumas of such an experience.

In "Jimi Hendrix" Victor notes that though his father's arrest ultimately "kept him out of the [Vietnam] war, [he] went through a different kind of war behind bars" (LRT 25). In turn Victor's father reminds Victor when he complains of having no real war that "fighting a war for this country [makes no sense]. It's been trying to kill Indians since the very beginning" (LRT 29). Alexie shows that his family and neighbors, like O'Brien's Vietnam veterans, are completely familiar with war. Over one-third of the stories in LRT refer to wars or attacks of one kind or another. From the visions of the Ghost Dance in "A Drug Called Tradition" to the Vietnam War protests in "Jimi Hendrix" to Thomas' testimony of Col. Wright's attack on the Spokane to the apparent nuclear attack described in "Distances," Alexie details the numerous instances of aggression past, present, and even future. Even internal disputes such as the brotherly battles of Adolph and Arnold in "Little Hurricanes" are "touched by memories of previous battles,

storms that continually haunted their lives"(8). Clearly, in Alexie's view the war is not over, and continues to be fought in various ways through the lives and circumstances on the Spokane reservation. Likewise, O'Brien notes about that "you can tell a true war story if you just keep on telling it" (85). "The point doesn't hit you until twenty years later, in your sleep, and you wake up and tell your wife and start telling the story to her, except when you get to the end you've forgotten the point again" (82). Both O'Brien's and Alexie's characters continue to experience traumas of their immediate past and beyond.[5]

Most of O'Brien's soldiers are not separated from the rest of the nation by ethnic or cultural background (except Kiowa, the son of a missionary from Oklahoma who carries the new testament and his grandfather's hatchet), but their experiences in the war have left them alienated from their families and friends. They find themselves in-between their former lives and their lives as soldiers, and unable to mediate between them—like immigrants in a new country (or dislocated tribes in their own). To an extent, the returned veterans' situation is more troubling and confusing since the place they now find strange and unfamiliar was once their home. One might say it is even more akin to Alexie's depiction of life on the Spokane reservation which shares the same popular culture as the rest of America, yet exists in much different circumstances and realities. The "familiar" America assumed by the mass audience sees the reservation as an alien place, and are in strict terms, "foreign" in the view of national polity since reservations are sovereignties within U.S. borders, or more properly--as Vine Deloria observes-- the U.S. is an occupying, foreign nation surrounding native territory.[6]

Giving voice to their characters' experiences has a special

5 Nancy Van Styvendale notes Alexie's understanding of a "trans/historical" trauma that descends through generations of aboriginal people.

6 Deloria's describes white American's sense of themselves as foreigners in North America. "therein lies the meaning of the white's fantasy about Indians—the problem of the Indian image. Underneath all the conflicting images of the Indian one fundamental truth emerges—the white man knows that he is an alien and he knows that North America is Indian—and he will never let go of the Indian image because he thinks that by some clever manipulation he can achieve an authenticity that cannot ever be his" (xvi).

urgency for both Alexie and O'Brien. Like foreigners or aliens, the O'Brien's living and dead GIs must rely on others to speak for them, but the men who survived cannot always communicate their stories either. Norman Bowker fantasizes constantly about having a conversation with his father about his time in Vietnam—when he "could've won the Silver Star" (TTC 150) but the smell of the shit field prevented him from doing so. He dreams of addressing the Kiwanis and instructing them about his hard won expertise "about all the wonderful shit he knew. Pass out samples" (TTC 144). Instead Norman drives around the lake again, imagining the conversation with his father or the Kiwanis speech, telling the story to himself. He has similar fantasies about casual conversations with Sally Gustafson (nee Kramer)—and *not* "saying a word about how he almost won the Silver Star" (TTC 140) or the shit field (TTC 145). Significantly, even in Norman's fantasy Sally objects to his crude language, insisting he does not "have to use that word" (TTC 145). Unlike many of his fellow soldiers, Norman survives, but he does not possess the ability or nerve to tell his own story, much less his comrades'. His imagined conversations betray his certainty that even if he could, his auditors would not be willing to listen to his unvarnished version of events.

Those soldiers who are able to speak of their experiences often remain silent. O'Brien's narrator admits that "in ordinary conversation I never spoke much about the war, certainly not in detail" (TTC 179). When he does tell his story, something gets lost in the retelling. Essential aspects of the stories are left out: as Norman laments, "Where's Kiowa? Where's the shit?" (TTC 181). A gulf exists not only between those who experienced Vietnam and those who did not—but amongst the combatants themselves.

O'Brien's GIs' encounter the same inability to communicate their experiences that the characters in Alexie's stories have in making their stories heard. Like O'Brien's characters, Victor's relatives cannot discuss their pain; they fear the "weather" in their lives—their historical and personal circumstances—as the storm moves "from Indian to Indian . . ., giving each a specific, painful memory" (LRT 8). They can only gather "to count their losses" but cannot or do not recount them freely (LRT 11). Likewise, in the foreword to LRT,

Alexie recounts his inability to ask his father about the incident he fictionalizes in "Amusement" (LRT xix).

Both authors dramatize the gap between their characters' stories and their audiences, and in the process dramatize the disturbance readers may initially experience with their works. Alexie's Spokane storyteller, Thomas-Builds-the Fire, spends most of his time "talking to himself" because "nobody wanted to be anywhere near him" and hear "all those stories. Story after story" (LRT 61; 72). Nevertheless, Thomas continues his tale-telling, convinced that "Mine are the stories which can change or not change the world. It doesn't matter which as long as I continue to tell the stories. . . . They are all I have. It's all I can do" (LRT 72-73). Evidently, the resistance to stories has been around long enough to make listening to them a form of punishment: Norma tacitly threatens to drag Victor and Thomas "to some tipi and [make] . . . them listen to some elder tell a dusty old story" (TLR 65).

In "A Drug Called Tradition" Junior and Victor watch Thomas talk to himself by Benjamin Lake, "telling himself stories" Victor says. "Ain't nobody else going to listen," they say (LRT 19-20). Some think he was "dropped on his head," others believe "he's magic" (LRT 20). In Thomas' vision, he claims that he and his friends decide "to be real Indians" and have a vision, breathing in the smoke from the fire. In the vision they throw away their alcohol and steal horses. Victor protests: "You don't believe that shit?" But Thomas insists "Don't need to believe anything. It just is" (LRT 21). As O'Brien's narrator might say, "if the answer matters, you've got your answer" (83). In the end Thomas warns them of dancing with skeletons, of being trapped "in the in-between, between touching and becoming" (LRT 22). "You can tell a true war story by the way it never seems to end" (TTC 76). For O'Brien's characters, as for Alexie's, the past has a way of hanging on; even if they cannot tell or even articulate their stories, their memories will not die, so they threaten to overwhelm their present life.

"We kept the dead alive with stories . . . passed [down] like legends . . . Often they were exaggerated, or blatant lies" (TTC 239). In similar fashion, Adrian and Victor tell stories of basketball legends, reservation heroes like Silas Sirius and his flying dunk. Adrian insists

that he "flew the length of the court . . . And I don't mean it looked like he flew, or it was so beautiful it was almost like he flew. I mean, he flew, period" (LRT 47). Victor laughs. He claims that he "believed Adrian's story more as it sounded less true" (LRT 47). The assertion echoes O'Brien's distinction between "story-truth" and "happening-truth" in "How to Tell a True War Story." "In many cases a true war story cannot be believed. If you believe it, be skeptical. It's a question of credibility. Often the crazy stuff is true and the normal stuff isn't, because the normal stuff is necessary to make you believe the truly incredible craziness" (71). In Alexie's "The Only Traffic Light" Victor narrates an uneventful evening's events to an unspecified audience. Clearly, the audience (like most of Alexie's readers) is unfamiliar with reservation life. Victor constantly needs to explain his actions and provide background for the stories that he and Adrian pass between them.

The traffic signal that no longer flashes prompts Adrian to point out that it "might cause an accident" (LRT 48), reducing both to tears since only one car passes in the hour they have been shooting the breeze. The joke is the sort of joke that is mainly funny to the participants, one which "you had to be there to get." It comes after Adrian's complimentary insult to Julius Windmaker that simultaneously questions and confirms Julius' status as the current basketball legend. Neither Julius or his friends respond to Adrian's insult because "they all knew Julius was the best ballplayer on the reservation these days, maybe the best ever, and they knew Adrian was just confirming that fact" (LRT 41). Victor makes certain his audience takes in the proper import of the insult—and confesses to his own fallen state as a former semi-legend trying to hide his "beer belly and chicken-pox scars" (LRT 44). Victor fills in an unknowing audience on Julius' place as "the latest in a long line of reservation basketball heroes, going all the way back to Aristotle Polatkin, who was shooting jumpshots exactly one year before James Naismith supposedly invented basketball" (LRT 45).

Victor goes on to predict Julius' likely fate: "There's a definite history of reservation heroes who never finish high school, who never finish basketball seasons" (LRT 47). His current condition suggests

fears about Julius future are not unfounded. Nevertheless, Victor insists that unlike in the white world where heroism quickly fades (such as "those guys who dove into that icy river to rescue passengers from that plane wreck"), "a reservation hero is remembered. A reservation hero is a hero forever. In fact, their status grows over the years as the stories are told and retold" (LRT 48). Julius is already on his way to becoming a petty criminal, vandalizing a BIA pickup and showing up drunk for his basketball game. Predictably, he is not the ballplayer they "all remembered or expected" (LRT 51). The game he shows up drunk for feels "like a funeral and wake all rolled up together" for the once and future reservation king, Julius Windmaker (LRT 51). The fans at the game tell "their favorite Julius Windmaker stories," celebrating his former exploits and lamenting his failed promise (LRT 51).

The laudatory stories depart starkly from depressing certainty both characters express about Julius and his predecessors downward course. As Victor notes, "It's hard to be optimistic on the reservation," though he also asserts "still, Indians have a way of surviving" (LRT 49). Again, compliment and insult (or at least damaging information) exist as one and the same; reservation heroes exhibit the same ambiguity—they offer role models in their sport for a time, but negative examples when they "don't even know how to pay their bills" (LRT 49). Despite Victor's bitter victory in predicting Julius' failure (and excusing his own), Victor comments to his presumably white audience, "I just can't explain how much losing Julius Windmaker hurt us all" (LRT 52).

Victor and Adrian do not see any connection between their negative predictions and the latest reservation hero's fate. They notice the broken traffic signal is still broken, but agree there is no "point of fixing it in a place where the STOP signs are just suggestions" (LRT 52). Neither warning sign—the failed drunken Julius sleeping on their living room floor or the broken traffic signal—is actually heeded; Victor, Adrian, and their neighbors observe the warning signs but do nothing to change either situation. As the narrator of "Little Hurricanes" comments about the many witnesses watching Victor's uncles fight, "They were all witnesses and nothing more. For hundreds of years, Indians were witnesses to crimes of an epic scale" (LRT 3).

Similarly, when Victor and his father come upon Jimmy Shit Pants, they leave "Jimmy to make his own decisions. That's how it is. One Indian doesn't tell another what to do. We just watch things happen and then make comments. It's all about reaction as opposed to action" (LRT 216).

Victor's father exhibits the same detachment as their car spins completely around and they continue on their way—neither Victor nor his father even comment. Victor muses "I'm always asking myself if a near accident is an accident, if standing near a disaster makes you part of the disaster or just a neighbor" (LRT 214). Obviously, the question is easy to answer if you stand by and watch the disaster unfold and do nothing—which is what Victor and Adrian do. They merely watch Julius Windmaker's fate overtake him in the same way they watch the coffee cup revolve again and again until it hits the ground.

The need to explain personal and collective failures binds O'Brien's and Alexie's characters. Both groups feel their failures have been imposed on them by circumstance, but both also feel responsible for their failures. Norman cannot forgive his inability to hang on to Kiowa in the muck; Victor and Junior cannot forgive themselves for acquiescing to the failure others expect of them. As Rocio Davis notes of ethnic writers and the short story sequence, the implied search that serves as the center of such sequences projects a desire to come to terms with a past that is both personal and collective," reflecting "displacement" and "a search for self" (Davis 7). One could say about Alexie's and O'Brien's characters feel similarly divided feelings (despite their gender) to the division Karen Weekes describes in female ethnic characters who feel "torn in various directions by familial, social, and personal demands; her divisive conflicts are perfectly reflected by the disjunctive possibilities of the genre in which they are presented" (Weekes 94).

The sense of guilt in both authors finds expression in guilt about complicity over killing. In "Good Form" the narrator O'Brien imagines being able to answer his daughter Kathleen's questions about the war. He imagines being able to say to her question "'Did you ever kill anybody?' . . . 'Of course not.'" Or he "can say, honestly, 'Yes.'" He feels responsible because he "watched a man die . . . I did not kill

him. But I was present" (TTC 179). O'Brien's narrator is a witness; similarly Alexie observes "for hundreds of years, Indians were witness to crimes on an epic scale" (LRT 3). Alexie's characters feel the same generalized guilt, as the title to "Witnesses, Secret or Not" attests. The questioning of Victor's father in regard to Jerry Vincent's disappearance goads Victor to question his father (in a manner reminiscent of Kathleen in O'Brien's work):

> "Have you ever killed anyone?"
>
> . . .
>
> "Why do you want to know?"
> "Don't know. Just curious, I guess."
> "Well, I never killed anybody on purpose."
> "You mean you killed somebody accidentally?
> "That's how it was." . . .

When they get home Victor's father "nearly cried into his food. Then, of course, he did cry into his food and we all watched him" (LRT 219). He's mourns Jerry Vincent's disappearance with something like survivor's guilt—and perhaps of his own future disappearance and his failure of responsibility toward his family.

Teaching OBrien and Alexie in conjunction with each other can help us explain each to our students. The possibly unfamiliar subject matter of O'Brien's and Alexie's stories may present challenges to students, yet both assert the power of narrative: as O'Brien's narrator states,"But this too is true: stories can save us" (TTC 255). Stories are more than entertainments, more than even artistic renderings of reality. They preserve human life in a story, "for when memory is erased, when there is nothing to remember except the story" (TTC 38). O'Brien insists that storytelling itself equals survival, just as the "Man He Killed" "wakes up in the stories of his village and people (TTC 124). O'Brien amends Alexie's aesthetic formulation of "survival=anger X imag" (LRT 150). Alexie puts it another way in Lone Ranger and Tonto, "Imagine a song stronger than penicillin" **(**153). Norman Bowker's suicide demonstrates that storytelling equals survival in a different way: sometimes survival depends simply on being able to tell one's story, even if some may see them as lies.

O'Brien's narrator says that "what stories can do . . . is make things present. I can look at things I never looked at. I can attach faces to grief and love and pity and God. I can be brave. I can make myself feel again" (TTC 172). These "lying" stories of Alexie and O'Brien can demonstrate for our students the truth of things we might not otherwise know or feel, make the hidden lives of these author's characters--GIs and Native Americans--present and real. They explain their characters' experiences to the outside world. O'Brien (as author and as narrator) and his characters feel a responsibility to those who did not return—the dead must rely on the surviving members of the company to tell their exploits as they explain themselves; Alexie's work bear similar witness for the erased history of his people and past atrocities that helped in large part to create their current circumstances. In this fashion, the stories make it off the reservation and into the lives of those students who hardly know reservations exist.

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A Successful Undergraduate Research Program at a Two-Year Regional Campus

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Abstract: Nationwide there is a growing demand for undergraduate research opportunities. This article details such opportunities that are provided at UC Clermont College in the Science & Health Department and offers insight on the administration of successful research experiences for undergraduate students.

Overview

Boundless opportunities exist for institutions in the area of undergraduate research. Many summer and professional programs now require undergraduate research experience and the rewards for students, faculty and institutions are significant. This article discusses how undergraduate research has been conducted at UC Clermont College in the Biology and Chemistry departments, but any discipline can be involved. Programs can be conducted with a minimal input of funds and the major requirement to start and run a successful program is having a motivated faculty. It is our hope to inspire other faculty to become engaged in such research by demonstrating that undergraduate research at any institution is viable.

Benefits of an Undergraduate Research Program

The Council on Undergraduate Research (1) recently published an article entitled "Evaluation of the Research Experiences for Undergraduates (REU) Sites Program" by Benison, Koski, Villa, Faram and O'Connor (2) in which a formal evaluation of undergraduate research was conducted. Results included a growing demand for such positions.

From a personal standpoint it has been my experience that this is true. As an Assistant Professor of Biology involved with my own and collaborative research projects, I have had several students approach me asking for research experience. Their reasons vary from simply being interested in becoming involved in the application of their

education to needing an undergraduate experience that is required by programs they were applying to. From my experience, activities that a student can participate in will be an overall value to their education, but there are specific benefits both to the student, teacher and institution. Aside from the obvious experience gained by the student, the faculty advisor to such projects will benefit from a professional growth perspective, particularly if that advisor is participating in the research themselves. In one current research project that I direct there are two undergraduate students; one was hired as for that position and the other is an Independent Study course student. This is a long term project centered on trying to establish the criteria for bluegreen algae blooms.

I am a member of a research group, The East Fork Collaborative which is composed primarily of governmental research groups. This project is an offshoot of the work being done in the Collaborative and the results of our undergraduate students could very well be an important contribution. Knowing this gives the students the feeling that they are not just doing an assignment, but participating in a real world endeavor that could have significant meaning. They are becoming practicing members of the scientific community, not just students.

Several other students have also participated in Individual Study courses that require less time and commitment but still give them some research experience. These students have learned the value of producing credible and reproducible data and they have also expressed satisfaction in participating in a project that may have value in the scientific community. Being the director of this project, the students have been invaluable for the time and energy that they have given and the work accomplished. The institution also benefits by being able to offer needed experiences for students as well as having it as a recruiting tool. Both students and faculty also have the opportunity to publish articles, present in conferences and participate in other professional venues. Projects such as these can often be the first step in the future professional lives of students, and help the student decide upon a course of study.

The Council on Undergraduate Research (1) lists other benefits such as fostering relationships between faculty and students as well as increasing interaction among faculty. It can also be an effective tool in the retention of students.

Getting Started

Regional universities should have the basic requirements for undergraduate research already at hand. It does not require expensive equipment or excess funds to do credible and original work. In fact, from past experience I feel that the less complicated the project the better. Students at this educational level need research projects that they can understand and execute. When working as part of a larger and lengthier project, there are usually small assignments that can be given in which the student can succeed. They will also know that their work will be used by others to reach their goals. Students also get credit for their work by setting up the project as an Independent Study class. Many do not need the credit and simply volunteer so that they can gain the experience for their resume. To get a project started all that is required is the desire to do so by faculty and students. Coupled with good planning and objectives, success can be obtained.

Only two years, how to make it work? Helpful hints

Setting reasonable goals

Keeping records

Interaction with other groups

Beginning, middle and end… How to start, continue and produce deliverables

Usually it is sufficient to invite students to participate in undergraduate research, as the mere invitation is a great ego booster. In addition, an invitation to participate can be used as a very effective method to generate a positive, cooperative attitude in a student who is struggling with negative feelings or counterproductive actions.

Students may join a research project that is already in progress, or they may elect to pursue a personal interest. If a student chooses to investigate a topic with which the advising faculty is unfamiliar,

both faculty and student will gain knowledge and experience. The first step, a thorough search of the pertinent peer-reviewed literature, will familiarize both with the topic. Students learn how to access professional publications for state of the art information as well as historical development of the subject under investigation. After reading current articles, a research project that is reasonable in scope is defined. With only a brief time to conduct the research it is important to undertake a project that is both interesting and new, but also that has a good chance of generating results in a short time. Other aspects to be evaluated are safety and cost. Beginning students are not familiar with lab safety details, so constant attention to safe procedures is a must. The project should not include the use of extremely toxic chemicals or dangerous techniques. Faculty will evaluate the various procedures for safety when executed by a neophyte.

Projects may require that students do a cost analysis of any proposed experiments so that departmental budgetary constraints do not prohibit completion of a reasonable portion of the project. A supply list is generated and the students must contact vendors for price quotes. A cost report can be assembled which details the actual expense of each student's project.

Students stay interested if the project quickly involves activity as well as reading. Preliminary experiments to bring the lab and the students up to speed can involve simply repeating recently published experiments. Once the most recent published results are duplicated, the students gain a strong sense of self confidence. After a preliminary set of data is obtained applications for grants can be obtained to support continuation of the research.

As experiments are started, proper record-keeping is required. Beginning research students may not be comfortable recording their results because they are preliminary. However, practice in recording will encourage students to take personal responsibility for the data. This is valuable not only for recording data from their activities, but it also provides the student with the ability to evaluate their time spent and productivity. These notebooks are turned in and become records as part of the final project. Students learn that the project lab notebook stays with the project, not the student. Supervising faculty or student

researchers may publish an article or present material at a professional meeting in the future and they will have credible material to use as a source.

Weekly research meetings allow the students to summarize the past week's work and share with other students. Being asked to report on a weekly basis keeps the students focused. It is much easier to generate the final report if writing has been done in weekly installments, wherein data is processed, tabulated and summarized. Proper referencing done concurrently with the experiments and writing makes the final write-up valid and suitable for publication or presentation.

The final report is a significant deliverable and is always the culmination of any undergraduate research project. Along with the lab notebook, the final report will serve as a guide for the next student to pick up the reins and carry on the research. Adequate time should be reserved for writing and editing at the end of the term.

Various Projects

Projects may involve one or more than one faculty member in collaboration. These collaborations are very valuable to the student. Exposure to more than one expertise demonstrates the power of multidisciplinary activities. Students might not take a whole class in a subject, but varied experiences in a research environment can supplement knowledge in the main field of interest and perhaps point the individual students each in their own slightly different directions.

Examples of Past Projects

Carrie Simmons – Gluten Intolerance

Based on a personal interest, this student was motivated to better understand Celiac Disease and to explore enzyme therapy as a means of relieving the side effects of gluten exposure. A very extensive literature search was conducted and the complex series of reactions common in celiac disease were revealed. The student became more knowledgeable on the subjects of digestion, immunology and enzyme behavior in the human body, and at the end of one quarter had learned enough to propose a research plan to investigate various enzymes.

Brad Bellamy – Forensic Analytical Chemistry

This student was specifically interested in obtaining quantitative results for determining the intensity of light emitted by luminol. Luminol is used by forensics experts to detect the presence of blood. Literature was searched and a plan to study the use of bleach to hide spilled blood at a crime scene was proposed. The goal was to come up with a substance that would allow the detection of blood in spite the application of bleach to the blood stain.

Jeannie King -- Skunk Study

In this project, the pre-veterinary student chose to study the DNA of pet skunks and wild skunks to determine if a difference exists. This student was motivated by personal concern to demonstrate that some skunks showed significant genetic difference and could be classified as domesticated. This was part of an effort to have pet skunks receive the rabies vaccine, and then if they bit someone the injured person could be sure that there was no rabies exposure as a result of the bite. This was a collaborative study between a biology faculty member, a chemistry faculty member, and with significant assistance from state agencies and additional veterinary faculty.

Student Views on Participating in Undergraduate Research

These are comments in the students' own words about their experience with undergraduate research:

Mary Warmin (2011)

"This summer, I have been doing research on clathrate-forming surfactants, under the supervision of Dr. Larrabee, as part of the University of Cincinnati WISE program. Surfactants are amphiphilic molecules that include soaps and detergents. They assemble into nano-sized spherical structures, called micelles, in aqueous solution. Micelles have a hydrophobic, oily center and a hydrophilic, watery exterior, which allows them to dissolve substances, such as oils and fats, which are normally insoluble in water. This tendency to encapsulate water-insoluble substances makes micelles of interest

as drug delivery systems. The micelle can protect the drug from the surrounding environment in the body, delivering a higher dose to target tissues, while preventing side effects caused by drug interactions with non-target tissues. In my project, we are comparing a new surfactant, tetrabutylammonium 10-undecenoate, to sodium 10-undecenoate, to see if changing the counterion changes the shape, size, and solubilization activity of the micelles.

In doing research as an undergraduate, I am gaining an appreciation for what it means to be a scientist. The hands-on laboratory research experience, combined with support and guidance from a faculty mentor, has helped me to develop my technical and problem-solving abilities, along with encouraging my passion for studying and learning from the physical world. I strongly encourage any undergraduate who wants to develop a deeper understanding of a subject to participate in novel research. I feel that my experience in the lab informs my coursework, giving me perspective on how the material that I learn in class relates to real-world applications."

Melissa Howard (2011)

"This past summer I have been working as an undergraduate researcher with Dr. Cliff Larrabbee and the REWU program (Research Experience for Women Undergraduates). I am working to determine the stability of a clathrate-forming surfactant, specifically tetrabutylammonium 10-undecenoate. An ionic clathrate hydrate is a sponge-like ice structure formed around certain ionic salt compounds. When a clathrate is formed there are many empty cavities throughout the crystal. These empty cavities have the ability to store molecules such as hydrogen. Ionic clathrate hydrates could be important for storing and transporting gases because they can be stable at higher temperatures and lower pressures, eliminating the need for liquefaction and pressurized storage. I am checking the stability of TBAU by determining the melting points of several different concentrations using a polarizing microscope and thermal stage to control the temperature.

When I first found out that I was able to do research so early in my education, I was extremely surprised. Upon returning to college

I thought it would be years before I could gain hands on experience in my field, other than your typical laboratory classes. Some students can go their whole college education without ever knowing what to expect when they graduate. Working in the lab this past summer has put my mind at ease. I not only have learned what real research is all about, but have also learned that I have the ability and the passion that it takes. It is exciting to perform different experiments in a classroom environment, but it is amazing to do something that has never been done before and you are not quite sure what to expect. I plan on continuing with research throughout my education."

Jackie Fischer (2009,2010,2011)

"My experience with Undergraduate Research has honestly changed my life. I have been lucky enough to be a part of two distinct projects as an undergraduate under Dr. Preston, each teaching me more about not only valuable scientific practices and techniques, but also myself. In my first venture in undergraduate research we attempted to isolate a unique gene in domestic as compared to wild skunks, in an effort to qualify skunks for the production of rabies shots. While this did not prove to be the case, in the process we did determined the best methods for DNA extraction and amplification allowing for clear examination of the electrophoresis gels. My second and current research experience is an attempt to determine all factors contributing to the growth of Cyanobacteria with a focus on local strains. We have yet to determine definitive answers, but promising results are proving it to be an important and interesting project.

These projects taught me a wide variety of methods and practices that I had no knowledge of previously. I learned how to make electrophoresis gels, use two types of PRS machines, what methods are best in extraction of DNA and chlorophyll-a, calibration of various machines and meters, serial dilution, and many other useful skills. In fact, these new skills helped me not only in future classes, especially in terms of proper lab protocol, but also gave me the edge in Field Study classes where ingenuity was needed for interesting independent projects as this is a necessary characteristic when working through the complexities and difficulties of undergraduate research. Most

importantly in my opinion however, undergraduate research actually swayed my firmly held views on what my future career would be. As an Environmental Studies major with a pre-law minor I had planned to become an Environmental Lawyer, but since I have found such a passion and knack for research I have decided to focus more on the environmental science half of my chosen field. I am finishing my Bachelor's of Science on this current project and am looking into obtaining a Masters degree in subjects such as Environmental Law and Policy and/or Science of Natural Resources."

John Hater (2010,2011)

"Having the opportunity to work as an undergraduate research assistant has by far been one of the greatest opportunities in my academic career thus far. As a student you are exposed to many new ideas and information and are often times not quite sure how these are applied in the working world. This was where working in research had the greatest impact. Having the ability to take what I have learned in the classroom and applying it to the research. This was anything from determining molality of solutions to preparing different media for culture growth. I must say though that the most important aspect that I can take from doing research is the ability to think outside the box."

Funding for Projects

If funding is needed there are several sources of grants available directed at undergraduate research specifically:

- The National Science Foundation (3)
- The Environmental Protection Agency (4)
- National Institute of Health (5)
- Grants From Health & Human Services (6)

Deliverables from Clermont Undergraduate Research

The possible deliverables include:

- Approval of a vaccine to protect domesticated skunks from rabies.

- Patent for clathrate material and process
- Cyanobacter research paper

Positive outcomes in addition to publications and presentations (student benefits, faculty benefits) include a gratifying experience wherein the faculty member becomes acquainted with a totally new field. Benefits come in the form of enhanced real experience so that the faculty member's lectures become more relevant to current topics. Also, contact with the students is a way for them to share cultural and academic information with each other and with the supervising faculty member. As the students increase their new professional network, they are developing contacts that will serve them well in the future.

In Summary

Undergraduate research can be a reality at nearly any institution and requires little more than ingenuity and motivated faculty to get started. The feelings of accomplishment and confidence will be a very important influence upon students and faculty with lifelong benefits for both. The student commentary included in this article demonstrates the impact that undergraduate research can have on students. A research environment is a learning environment in which the effects spill over and aid the educational process of an institution by fostering the professional growth of students and faculty. It is the authors' hope that this glimpse of undergraduate research at an Ohio Regional University will inspire others to do the same.

Endnotes:

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2. Evaluation of the Research Experiences for Undergraduates (REU) Sites Program
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4. U.S. Environmental Protection Agency
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Greater Research Opportunities (GRO) Program
http://www.epa.gov/ncer/rfa/2011/2011_gro_undergrad.html
5. National Institutes of Health (NIH)
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6. U.S. Department of Health and Human Services
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Biographical Information

Michael Preston is an Assistant Professor of Biology at UC Clermont with a background in Dentistry, Molecular Biology and Environmental Science. Research interests include the stimulus for cyanobacterial blooms and DNA electrophoresing. Current projects include finding the physical stimulus for bluegreen algae blooms.

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After obtaining a BA in Chemistry at Wright State University Rebecca LaRue earned MS and PhD degrees from the Chemistry Department at the University of Cincinnati. Then at the Harvard School of Public Health she participated in research with the Environmental Engineering Department, and during a Postdoctoral Fellowship at The University of Dentistry and Medicine of New Jersey she designed a human exhaled breath sample collection device as well as a roof-top outdoor air sampler. While at the Cooper Union for the Advancement of Science and Art she conducted sensor research with a large undergraduate/graduate research group, generating multiple masters theses and a patent on a novel quartz crystal microbalance design. Then, at the University of Cincinnati Chemistry Department she was fortunate to participate in research with Dr. Harry B. Mark using electrochemically aided solid phase microextraction, and nanostructures for electrode coatings.

Currently she is involved in undergraduate projects in the field of analytical chemistry and fresh water cyanobacter research.

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Wireless Headset Technology in Nursing Education

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Introduction

Mobile wireless technology use in nursing curricula is a relatively new phenomenon. Jeffries (2005) noted that nursing educators should begin shifting toward a paradigm incorporating information technology to increase student learning opportunities. The use of wireless mobile technology within the healthcare setting has increased tremendously over the past few years. It has been suggested that technology is changing how education and instruction is taught and delivered (Chastain, 2002). The adoption of mobile technology into the education environment has been noted to improve communication between the student and instructor and improve learning efficiency (Rau & Li-Mei Wu, 2008). The need for healthcare providers to communicate accurately, clearly, and promptly is essential to quality patient care (Kuruzovich, Angst, Faraj, & Agarwal, 2008). Communication errors have been identified by The Joint Commission (2011) as one of the primary causes of sentinel events (http://www.jointcommission.org/).Therefore effective communication is essential between the instructor and students within the clinical settings. The clinical instructor facilitates learning by role modeling and providing knowledge, experience and continuous feedback (Jefferies, 2005).

Nursing Clinical Education

Clinical education is becoming a larger part of nursing education instruction and often comprises up to 50% of the hours spent in a nursing program (Gignac-Caille & Oermann, 2001). The purpose of nursing clinical education is to provide students with knowledge and practical experience to prepare clinicians to manage care with optimal health outcomes. The rapid evolution of health-care has required nursing educators to increase significantly the nature

and quality of students' clinical learning experiences (Adams, 2002; Chan, 2002). It is within the clinical experience that students are required to develop the relevant knowledge, skills, and competencies to fulfill their role as a future registered nurse (Chan, 2002). Clare, White, Edwards & Van Loon (2002) found that nursing students and healthcare providers both desire clinical placements that will provide nursing students with quality learning experiences.

The support that clinical instructors provide is important for learning to take place within the clinical settings. The predominant challenge in nursing clinical education is that of teaching and learning in an environment that is difficult to control (Cassimjee & Bhengu, 2006). Clinical instructors have the responsibility of providing supervision to students in dynamic health care settings. Communication in clinical instruction may be impeded due to students in a clinical group often being distributed on multiple units in order to meet clinical objectives. This is made more problematic by the typical faculty to student ratio of 1:10 (Salzman, 2002). The high complexity and acuity of today's hospitalized patient requires frequent communication between instructor and student in order to promote safe, effective care. Students need feedback through immediate communication from the clinical instructor in order to facilitate clinical learning (Brennan & Hutt, 2001). Cassimjee and Bhengu (2006) indicated the role of the clinical instructor includes being a consultant, a resource person, a counselor and advocate. The lack of feedback or communication has been indicated as one of the factors that impede clinical learning (Hogard et al. 2005, Lambert & Glacken, 2005). The importance of communication clearly points to the need to ensure that every nursing student is communicating in a timely manner with the instructor to access feedback, knowledge, expertise, and assistance (McConnell, 2001).

Literature Review

Wireless is a huge part of the telecommunication technology, which consists of technologies involving radio waves instead of cables or wires to carry a signal to connect communication devices (Greene, 2002). The distances involved in this type of communication vary

from within a few feet to extending to cover a small geographical area such as a clinical unit setting. Wireless technology enables users to physically move while using an appliance, such as a handheld personal computer (PC), personal digital assistant (PDA), paging device, or phone (Havenstein, 2005). Wireless headset technology (WHT) has the potential to combine portability, exchange of information, and convenience all in one device. Technology such as the use of WHT will facilitate student reinforcement of core knowledge for practice as well as strengthen confidence by allowing the instructor to provide immediate feedback (McBride, 2005).

Saba and McCormick (2006) discuss the possibility of legal malpractice issues in regards to the utilization of WHT technology. Malpractice issues could become an issue if a breach of duty to provide care becomes an issue. The WHT enhances care through the rapid ability to call for help when a patient needs it. Saba and McCormick (2006) discuss several ethical issues in regards to the utilization of WHT technology. Confidentiality is maintained by utilizing patient room numbers and client initials if a patients name is spoken over the WHT. No patient data is entered into the WHT because the WHT is a wireless verbal communication device. Patient privacy is maintained by the nurses adhering to the same privacy and confidentiality measures taken with face-to-face communication in regard to being overheard when speaking into the WHT device. Furthermore, the headset design of the WHT device utilized can only be heard by those wearing the headsets and on the same channel. The hands-free WHT includes a swivel belt hoister with a spring clip for easy ergonomic access. The ergonomic lightweight headset slips easily onto the ear and sits comfortable against the ear canal. Security is always an issue with the use of wireless technology so the WHT has built in microphone that must be manually activated by the user to communicate which makes it very secure in any environment.

Purpose

Because of the significance clinical education has in preparing entry-level clinicians, this pilot study was conducted to assess the extent to which the clinical instructor can effectively communicate

providing support, supervision, and improved work flow efficiency using WHT to second-year nursing students during a medical-surgical experience. A second purpose was to investigate the usability of the WHT during client care.

Method

Design and Procedure

This pilot study is a two stage descriptive evaluation of the use of WHT mobile devices in nursing education. Stage 1 objective includes a one-on-one trial designed to test the feasibility of the use of the wireless headset technology with nursing students during patient care. Stage 2 objective includes evaluation of whether wireless headset technology would enhance instructor communication and workflow efficiency in students' clinical experience. Participants were recruited from a second-year medical-surgical clinical nursing course. Participation was voluntary, and written informed consent was obtained. Participants were informed the study would involve a one-time completion of a questionnaire and group focused discussion and their written responses would be kept anonymous and confidential. Focus discussions were used to ascertain how the WHT enhanced learning and difficulties associated with their use.

After sending formal written requests for cooperation to the education institution and healthcare facility and then obtaining permission and ethical approval to conduct the pilot study, the researchers visited the students that expressed willingness to participate. Following the informational meeting the researcher met with the students in person and received informed consent, resulting in a 100% response rate. One faculty and ten volunteer students in the second year of an Associate Degree Nursing Program at a mid-western university regional campus participated in this part of the pilot study.

Stage 1, then, examined the use of mobile devices in Adult Health Alterations clinical course. The study participants consisted of one group: a mobile learning group (N=10). The mobile-learning group used the wireless head and radio set with wireless communication capability. The participants were supplied with the wireless headset, radio receiver, power pack, and a drop-in battery

charger.

Faculty and students utilized the two-way radio headset in clinical each week for 10 weeks, while providing direct patient care. The headsets utilized for this study were compatible with unit staff's existing communication system. The faculty, students and staff headsets were programmed to the same channel which provided an additional opportunity to share information between all care providers. At the conclusion of the quarter (week 10) students completed a questionnaire and participated in group focus discussions to obtain data about their perceptions of clinical communication with faculty utilizing the headset communications system.

Equipment

Motorola two-way radio wireless series (Model CLS1410) were used for this study. Mobile Two-Way Radios are wireless devices that are used to send voice messages one-to-one or one-to-many over radio frequencies within a local area. They run off of a rechargeable lithium ion battery. The WHT product selection was based on cost, flexibility of utilization and facility support for a product that would not cause internal nursing unit technology interference. The WHT products consist of a 2-way radio that are easily carried to clinical by faculty and are easily implemented. The Motorola 2-way radio cost was $139.98 (includes: headset, charger, and lithium battery) and the earpiece with inline microphone was $20.96. The cost of WHT was paid for through grants and University end of year funds.

Student Training

Training sessions were held prior to clinical and placed a focus on the functions of the WHT, charging, and how to manage potential technical problems that may occur in the clinical setting**.** Additionally, students were instructed on etiquette of WHT emphasizing avoidance of interruption of direct patient care to answer headsets and review of the facility confidentiality policy. Students were instructed to use room numbers only when requesting faculty, staff or student assistance with direct care issues. Clinical faculty were responsible for distributing, maintaining and collecting the headsets each clinical day.

Instruments

This was a descriptive study utilizing a 10-item Likert-type questionnaire. The researchers generated survey items from professional experiences, the objectives of the study, and the reviewed literature. The instrument was tested for reliability as two experts in nursing research assessed it for content validity this was tested against the research objectives.

Data were collected over a 10-week period from March through May from senior students enrolled in an ADN program. The students who participated were selected through convenience sampling from a second level medical-surgical course in an ADN (n=36) program. A semi-structured self-administrated questionnaire was developed to collect the data. The instrument comprised of a demographic data section consisting of the following variables: age, gender, current quarter in the program, and current status in the program.

In addition to the collection of the questionnaire, two focus group discussions were conducted. The first focus group was completed mid-quarter and the second at the completion of the quarter. The focus groups used a semi-structured guide, including open-ended questions, to promote discussion and explore issues about the use of the WHT, influences on the students' learning, and instructor communication and efficiency in the clinical setting.

Demographics

A total of 10 students participated in the pilot study. The majority were traditional students (n=10) (attending their first post-secondary educational program), under the age of 30 (n=9; 90%), English was their first language, 90% (n=9) were women and 10% (n=1) were men.

Results

Experience in the use of WHT

Questions 1 and 2 (Q1; Q2) asked respondents: How would you describe your level of comfort and usability with the following? Two items were offered, headset and radio pack. In addition the

comfort options of: very comfortable, comfortable, little comfort, not comfortable. Overall 90% (n=9) of the respondents found the headset comfortable and easy to use. One participant (10%) found the ear bud on the headset to be uncomfortable. In addition 100% of the respondents found the radio pack comfortable and not obtrusive during patient care.

Students' Impressions of the WHT

Focus group discussions revealed that the students' general impressions of the WHT were positive and encouraged further use in the future within the clinical area. Most students found the WHT easy to use because they had previous experience and familiarity with headsets on their personal cell phones. Students found the radio base to be secure in the clip-on case. While providing direct patient care such as with showering, students "moved it [the headset] into my pocket." None of the students lost the radio base or headset. Battery power was not a problem as faculty were vigilant in recharging after each clinical day.

Communication

Data collection on communication focused on the process improvement with using the WHT including the student(s) and instructor. Participants were asked in Q3 through Q5: The overall process in working with the WHT improved communication between the student and: instructor, nurse, and other students. Responses were made on a Likert-type scale (1=strongly agree, 2=disagree, 3=undecided, 4=agree, 5=strongly agree). The overall mean score 4.25 (SD 0.45) indicated students perceived instructor communication with the WHT as efficient and valuable. Participants (100%) perceived the WHT as effective in improving communications with: the instructor; the nurse; the other students.

Workflow Efficiency

When participants were asked in Q6 through Q10: Overall, the experience in working with the headset technology improved: three applications were offered divided into categories of: instructor efficiency

in communication, and instructor workflow efficiency. Responses were made on a Likert-type scale (1=strongly agree, 2=disagree, 3=undecided, 4=agree, 5=strongly agree). As denoted by the higher overall means scores for efficiency in communication mean 4.75 (SD 0.33) and work flow efficiency mean 5.0 (SD 0.48). Instructor use of WHT improved students' perception of instructor workflow efficiency. One student indicated "All of the patient assessments were complete by 8am and my instructor was ready to start with meds. Before in clinical my instructor would have been too busy reminding everyone about getting the assessment done. With the headset my instructor just called and told everyone I will be around to check assessment in 10 minutes. Then I knew to get it done." Another student indicated "it was great my instructor would answer on the headset and tell me she would be there in 5 minutes to change the dressing and have my equipment ready." The students were positive about taking responsibility for the WHT and indicated they enjoyed the ability to hear the instructor talk with other students. Students indicated "this saves me time and prevents me from being left out when I heard my instructor talking."

Students also indicated that instructor workflow was more efficient because they were able to spend more time with patients because "it was not necessary to leave the patients room to look up the instructor". One student said "it was just time savings for me, I could just call the instructor through the headset and we could make the arrangements from her to come to my room."

Discussion

This pilot study demonstrated that the use of WHT has the potential to improve effective communication between the instructor and students. As a result of this pilot study, the University decided to financially support and make available WHT to all medical-surgical clinical students and faculty. Although WHT may not be feasible in all areas in which students have clinical assignments, this study provided support for integration into medical-surgical clinical. Evaluation of this integration will be forthcoming.

Limitations

There were several limitations to this project. The sample size was small, and the discussion group sessions may be confounded because the researcher conducted the sessions and was also a co-participant in the group. As with any pilot project the findings may not be generalizable to other programs. Additional research is needed to further determine the best practices for WHT to communicate within the clinical setting in order to enhance student learning and instructor workflow efficiency.

Conclusions

This pilot study demonstrated that students perceived that their learning was enhanced by the use of WHT. It was interesting in this study that students actually requested to use the WHT in subsequent quarters. The use of WHT by nursing students in the clinical setting as an innovative approach to learning in nursing education is relatively new. This study is one of the first using WHT in the education of undergraduate nursing students in a clinical setting. These findings provide support for the future use and evaluation of WHT in nursing clinical education as a tool to facilitate communication and workflow efficiency. By improving communication of healthcare information, the student nurse and wireless technology can increase the accuracy of patient data; increase the efficiency of health care providers to deliver immediate access to healthcare and administrative information. The new technological nursing graduate is in a great position to introduce, implement and evaluate new technologies at the point if care.

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A Report on Case Study Application in an Undergraduate Anatomy and Physiology Course

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Abstract

A number of academic institutions have replaced the traditional methods of teaching anatomy and physiology, in which teachers are active presenters and students are passive recipients, with more active teaching techniques. Since learning abilities among college students vary considerably, it is critical for instructors to recognize the student diversity and their unique needs in order to enhance the learning experience in the classrooms. The primary aim of the present study was to evaluate the impact of case studies and active student participation in case discussions on the learning of biological concepts among undergraduate students with interest in healthcare related fields such as nursing. In the current study, students' perception and comprehension of biological concepts were evaluated over four semesters under traditional didactic and case-discussion teaching methods. Students received didactic lectures using PowerPoint presentations; however, in case discussion approach, certain biological concepts were augmented with case studies in which the faculty played a role as a facilitator and coordinator of discussion rather than the primary lecturer. Students were allowed to discuss the presented cases. Forty questions were designed to evaluate the students' comprehension of case discussions. These questions were integrated into the exams throughout each semester and were utilized to evaluate students' comprehension. Students were also asked to respond to a survey at the end of each semester. The results of survey were used to assess the students' perception of case-discussion approach. The results suggest positive students' perception and an improvement in students' comprehension of biological concepts when the learning was augmented with case discussion. The results support the notion that regardless of the students' background and level of experience, active involvement of the students into class discussions can be effectively utilized as an addition to the traditional didactic lectures in teaching human anatomy and physiology to undergraduate students.

Introduction

Educating and maintaining well-informed healthcare providers is one of the key elements of a healthy and successful society and can be achieved by training the students with the highest standard of education and competency. Having the ability to construct new facts based on available information, rather than finding information somewhere in a book, is an imperative skill for those interested in any scientific field. This skill can be accomplished by maximizing students' theoretical comprehension and ability to construct new information in the field of their interest. This characteristic has been missing from many primary and secondary school curricula. Despite the fact that active participation of students in the classroom discussion is an effective teaching technique, previous reports from the National Science Foundation and the National Research Council have indicated that the majority of science courses that are being taught in colleges and universities only use traditional didactic lectures, in which the faculties are active presenters and students are passive recipients of information (1, 2). It is important to point out that both faculties and students have resisted the implementation of such approaches in science courses (3). The reason for such disinterest ranges from a lack of knowledge as how to integrate active learning into the traditional didactic lectures by the faculty, to a lack of motivation and poor attitude towards sciences by the students (3, 22). Understanding the basic concepts of human anatomy and physiology is essential in promoting higher level of learning in healthcare related fields such as nursing, and in order to promote a higher level of learning, it is vital for the students to learn how to construct their own knowledge from basic facts and data, rather than subjecting all information into memory without an in depth understanding of complex concepts.

One way to improve the students' learning experience is the utilization of scaffolding teaching technique. The term scaffolding comes from the works of Wood, Bruner and Ross (4). Scaffolding instruction, as a teaching strategy, originates from Lev Vygotsky's sociocultural theory (5) and acts as a bridge used to build upon what students already know in order to arrive at something they do

not know (6). In scaffolding teaching, the instructor only attempts to help the students with tasks that are just beyond their current ability. With the instructors' feedback and prompting, the student takes responsibility to solve problems or masters complex concepts. Other reports have also demonstrated that case discussions that are content driven and designed to serve specific learning objective are an effective method of teaching (7-9). Thus, the current study was designed to evaluate the impact of case discussions based upon scaffolding principle on the learning of anatomical and physiological concepts in an undergraduate anatomy and physiology course. This approach was stemmed from previous reports suggesting that active involvement of students in the classroom settings enhances the quality of learning among students (7-12). In order to reach the goals of the current study, traditional didactic lectures were augmented with relevant case studies and the students were encouraged to analyze the cases through class discussion and facilitated dialogue. The students' responses to exam questions and the end of semester survey results were analyzed and salient features are described in this report.

Methodology

Kent State University-Ashtabula (KSUA) is a campus of 2,500 students mostly from Ashtabula and Lake County regions of the Northeast Ohio. Biological Structure and Function (BSCI 20020) is a five-hour credit lecture/laboratory course that was offered to students with interests in nursing. BSCI 20020 was designed to encompass basic design of human systems emphasizing the physiology and anatomy aspects of organ-system structure and function. The lecture component of BSCI 20020 focused on physiological concepts, while the laboratory components placed emphasis on the anatomical features of human body. The course consisted of 32 lecture periods of 110 min each, and 15 laboratory periods of 180 min each.

The study was conducted among undergraduate nursing/prenursing students at KSUA for four consecutive semesters (fall=2006; n=48; spring 2007, n=37 fall 2007, n=34; spring 2008, n=35). The teaching module was composed of didactic lectures using a combination of PowerPoint presentation and traditional blackboard explanations. Case

studies were only utilized in fall 2007 and spring 2008. The topics of the cases were determined by monitoring the students' response to exam questions during fall 2006 and spring 2007. A series of most commonly missed exam questions were identified and case studies were developed to reinforce the central concept of each question. When case studies were used, the cases were designed to engage students in an actual life situation and encourage them to take an active role in solving the problems. The cases were organized in a fashion that related to a real life situation in order to raise students' interest and attention. The students were encouraged to fashion solutions to the problem through a process of facilitated dialogue and scientific reasoning. In general, each case study included four steps in the following order: 1) presentation of the didactic lectures that cover the relevant material to each case study (~ 30-45 minutes), 2) presentation of the actual case (~ 3-5 minutes), 3), student discussion (~ 10-15 minutes), and 4) final faculty case analysis and students' questions (no time limit). Twenty-four case studies were presented throughout each semester. A list of topics and case studies is provided in Table 1.

Topic	**Case Study**
Histology	Decubitus Ulcers
Cell Junctions	Pemphigus Vulgaris
Coagulation	Hemophilia
Autoimmune Disease	Rheumatoid Arthritis
Parasympathetic Nervous System	Micturation Reflex Disorder
Body Flora	Pitted Keratolysis
Endocrinology	Cushing's Syndrome
Hemoglobin	Cyanosis
Iron Deficiency	Spooned Nails
Respiratory System	Bronchogenic Carcinoma
Arsenic Poisoning	Mee's Line
Vision	Infantile Esotropia
Autonomic Nervous System	Autonomic Dysreflexia
Neuronal Pathway	Phantom Pain
Pain	Autonomic Neuropathy

Bone Density	Osteoporosis
Vitamin “D” Deficiency	Rickets Disease
Vitamin “C” Deficiency	Scurvy
Collagen Synthesis	Osteogenesis Imperfecta
Chronic Inflammation	Ankylosing Spondylitis
Leukemia	Lymphoma
Cardiac Circulation	Congestive Heart Failure
Cardiodynamics	Neurocardiogenic Syncope
Sex-Linked Genetic Disorders	Muscular Dystrophy

Table 1. The list of twenty-four topics and relevant case studies that were presented throughout each semester.

The student comprehension of the subject matter was evaluated by analysis of students’ response to exam questions and generating a quantifiable data. Evaluation and grade assignment in the lecture portion of BSCI 20020 were determined by a series of four exams. For the purpose of the present study, 10% of the total questions (40 questions) were directly related to the case study discussions. The Students’ responses to the selected questions were compared to that of fall 2006 to spring 2007 with the variable being the application of case studies.

In general, each class began with a didactic lecture that was or was not followed by a relevant case study. When a case study scenario was presented, the case was brief and appropriately formulated in such a way that matched the students’ level of understanding based upon the recent acquired knowledge. First, students were provided the basic information regarding a biological topic (e.g. blood circulation), and then they were presented with a related case study (e.g. congestive heart failure). The cases were organized in a fashion that provided students several clues. The clues included but were not limited to pictures (e.g. X-ray), symptoms, laboratory results, patient’s statement and physician’s observations. Based upon the knowledge that was acquired by the clues in the case description, the students were encouraged to initiate discussion and analyze the case in a class discussion. The format of discussion was open forum and the

faculty took the role of facilitator and moderator, rather than an active presenter, occasionally guiding the discussion in the correct direction by emphasizing the value of clues. Students were discouraged from drawing a final conclusion without the initial discussion. After the allocated time, the faculty explained the cases by emphasizing the lecture material and the significance of clues, and the students had the opportunity to ask questions and further discuss the case. One or two questions regarding each case were included in the following exam. Table 2 and 3 are examples of cases studies and corresponding questions that were used in the exam. Although throughout each semester this mode of teaching was continued in parallel with didactic lectures, not every biological concept was augmented with a case study. At the end of each semester a survey was also administered to assess the students' perception regarding the usefulness of case-discussion approach. The survey was framed in such a way that yielded information about the students' perspectives and opinions regarding the case-oriented teaching approach.

The quantitative data were analyzed using a paired 't' test, where the responses to the selected questions were compared in respect to the application of case studies. For the students' responses to the selected questions, all values are expressed as the mean percent total ± the standard error of 'n' observations. A $P < 0.05$ was considered significant. Only the data from students who remained in the course to the end of each semester was utilized in the study. The data from students who failed to withdraw but did not attend the class was not included in the analysis.

Case: Congestive Heart Failure
James bond, a 40-year-old man with a pack/day smoking history and recent complaints of angina (sub-sternal chest pressure) upon exercising, collapsed while spying for the British. Paramedics arriving at the scene found him unconscious, not breathing, without a pulse. CPR was successfully performed and James (also known as 007) was transported to the hospital. An ECG was suggestive of an anterior wall myocardial infarction (heart attack), and he was given an intravenous solution of tissue plasminogen activator (tPA). Elevated blood creatine kinase (CK) and troponin levels measured over the next 2 days. Coronary angiography was performed a week later, revealing the following results:

Circumflex artery: 10% blocked
Right coronary artery: 15% blocked
Anterior intraventricular artery: 95% blocked
X-rays indicated hazy Lungs and the heart appears enlarged.
Explain the reason for hazy lungs and enlarged heart.
Questions on the exam:

1. A 61-year male was brought to ER with systemic edema and chest pain. X-rays indicate enlarged heart. Which one of the following may explain the patient's condition?

A) Patient has left ventricle deficiency and cannot pump the blood into aorta
B) Patient has left atrium deficiency and cannot pump the blood into left ventricle
C) Patient has right ventricle deficiency and cannot pump the blood into pulmonary trunk
D) Patient has right atrium deficiency and cannot pump the blood into the left ventricle
E) None of the above may explain the patient's condition

2. Which of the following is the primary outcome of weaken left ventricle?

A) Pulmonary edema
B) Systemic edema
C) Tachycardia
D) Bradycardia
E) Hypertension

Case: Coagulation
Christopher Columbus, a 21-year-old Spanish explorer, presented to the physician with a long medical history dating back to 1980's when, as a 6-year-old, he was referred to a pediatrician by a dentist. At that time, the dentist referred Chris to a hematologist for concerns over extensive bleeding specially since the patient's brother died at age of six months from an internal hemorrhage. Interestingly, Chris's maternal grandfather died at age 25 of a bleeding complication following a hernia operation. Chris's maternal grandmother remarried, and Chris's mother lost complete touch with her deceased father's family. Lab findings for Chris are as follows:
Platelet count= 280,000 / mm^3 of blood (normal = 150,000 - 350,000 / mm3)
Prothrombin time (PT) = 11 seconds (normal = 10 - 12 seconds)
Partial thromboplastin time (PTT) = 58 seconds (normal = 20 - 30 seconds)
Hematocrit and white blood cell counts were both normal.
What is the matter with Chris?
Question on the exam:

1. A seven year-old male was brought to ER from a car accident scene. CT scan indicates an internal bleeding that ER physicians are unable to control. The patient's laboratory results indicate an elongated Protime, a normal Partial Thromboplastin Time. Which of following may explain patient's abnormal bleeding.

A) Patient may be a hemophilic type A
B) Patient may be a hemophilic type BPatient may have either hemophilia A or B
D) Patient may have deficiency in his intrinsic coagulation pathway
E) Patient may have deficiency in his extrinsic coagulation pathway

Table 2. Two examples of case studies that were utilized in the classroom discussions.

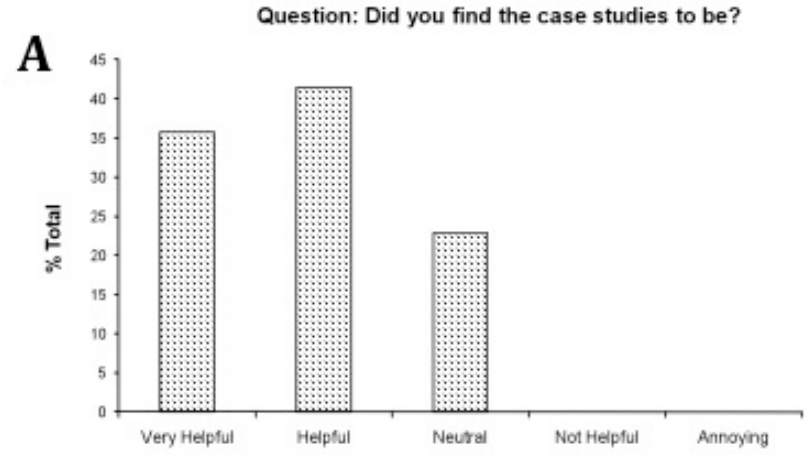
Results

Student Demographics

According to the survey, a large proportion of students (~ 49%) who enrolled in BSCI 20020 had no recent background in biological sciences, while a small majority of students (~ 51%) had at least one biology related course within the previous two years. The students came from diverse backgrounds with a larger proportion of females to males (84.9 % females and 15.1 % males). The students' age varied considerably ranging from seventeen to the late forties.

Student Perception

More than 77.9 % of students who were surveyed stated that case studies were 'very helpful' or 'helpful' in allowing them to better comprehend the subject matter, while 22.9 % felt that case studies neither helped nor hindered their comprehension of the related material (Figure 1A). Approximately 88.2 % of students were of the opinion that case studies improved the overall quality of the course, while 5.9 % stated they would like fewer cases and 5.9 % would like no case studies in the course (Figure 1B). The majority of students indicated that case studies help them to better grasp the topics at hand (72.9 %), while 5.9 % disagreed. Approximately 21.2 % of students had neutral opinion regarding the application of case studies on their level of comprehension (Figure 1C)



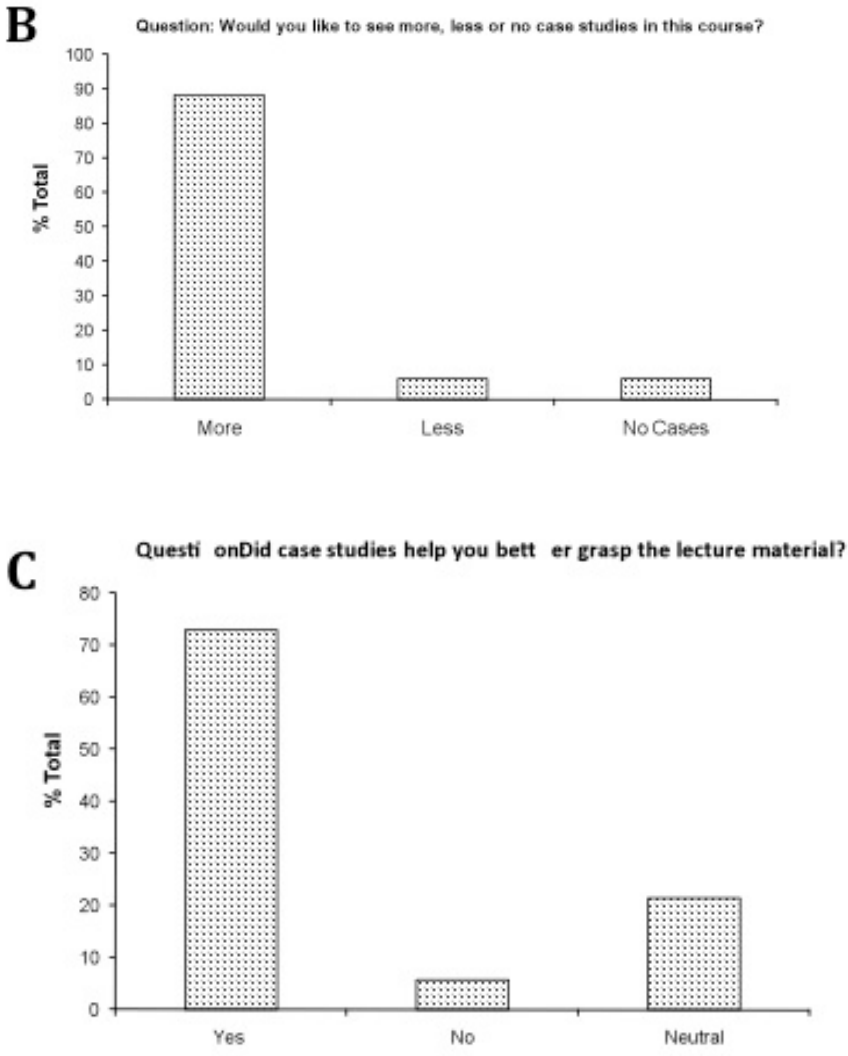


Figure 1. Students Perception; A) The majority of students indicated that case studies were “very helpful’ or ‘helpful’ in allowing them to better comprehend the subject matter (77.1 %). The remaining students indicated that case studies neither helped nor hindered their comprehension of the related subjects (22.9%); B) The majority of students (88.2 %) would like to have more case studies in the course work compared to only 11.8 % of students who would like to have no or less case studies; C) The majority of students indicated that case studies help them to better grasp the topics at hand (72.9 %), while 5.9 % disagreed. Approximately 21.2 % of students indicated no particular affect associated with the application of case studies and their level of comprehension.

Performance outcome

Students were ranked based on their response to a series of forty selected questions in four lecture exams each semester. When the students' response to the selected questions were compared in respect to the application of case studies, the students who received the case studies scored on average 17 % higher than the students who did not receive the case study presentations (Figure 2).

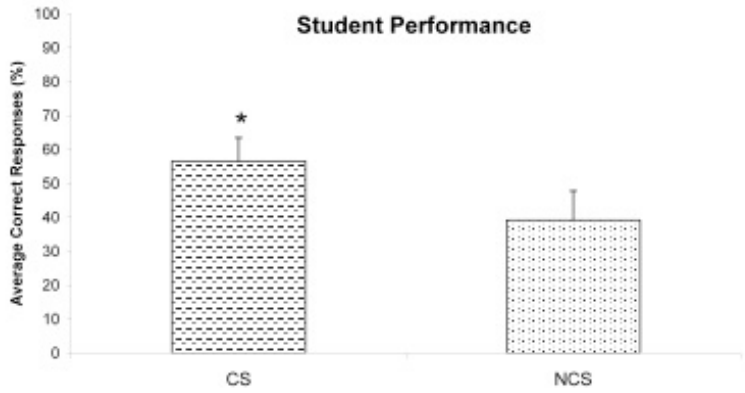


Figure 2. Student Comprehension; students improve their accuracy in response to a selected group of questions by more than 17% when their response was compared to the same questions without the application of case studies (Case Study, CS= 56.55% n=69, fall 2007 & spring 2008; no case study presentation, NCS= 39.21% n=85, fall 2006 & spring 2007, *significantly different when compared CS to NCS, * $P<0.05$).

Discussion

Academic success is a term that is often used to indicate student's ability to succeed in an academic environment, but sometimes confusion is created by the way this term is used. Although the standard of academic success must be upheld to the same level in any academic institution, the needs of each student population in achieving the same level of success may vary considerably. An eighteen-year old high school graduate with a strong background in biology is very likely to succeed in BSCI 20020 compared to a non-traditional student who has not had any recent exposure to the

biological sciences. To enable students reaching their optimal potential in the classroom regardless of their background and personal lives is a difficult task. The current study describes the introduction of a teaching technique based on scaffolding principle in which didactic lectures were augmented with relevant case studies. This study demonstrates the effectiveness of case studies and class discussions in teaching biological concepts in human anatomy and physiology to undergraduate students with interest in nursing.

Regardless the careers students choose after college, the ability to think critically is an essential skill to any profession. In the field of biological sciences such as anatomy and physiology, certain facts must be learned, but it is not the knowledge of facts alone that makes a successful student, but it is the ability of student to effectively apply his/her knowledge to real life situations that accounts for the success. Although it is well known that for a healthcare professional, there is no substitute for practical hands-on experience, such experiences would be only reinforced and strengthen by a strong theoretical comprehension and ability to apply critical thinking to solve problems. Thus, the primary responsibility of healthcare educators is to teach the student how to apply their knowledge in their career.

Although didactic lecture are one of the oldest and widely used teaching methods in anatomy and physiology classes, there have been many reports suggesting that direct involvement of students in the learning process improves learning experience among students (7, 10). In order to raise the educational standard in colleges and universities, the science educators need to improve students' educational skill level by introducing new techniques that encourages students' active participation. The center piece of case-discussion teaching style is the highly active participation of students in classroom, which if directed properly, may change and enhance the classroom learning experience. However, it is important to note that there are various definitions for active learning in the literature (13-17). This report uses the definition of Modell and Michael that active learning is one in which students engage in the process of building and testing their own mental models from information that they are acquiring (17). Of course, there are various methods of introducing case studies into class curriculum

which include but not limited to small group discussion, individual case analysis or whole class discussion. The choice of method solely depends on the faculty who needs to assess the student population and the relevant course content in order to formulate the best approach in introducing the cases into the class curriculum. Class sizes and student population are important variables that need to be considered prior to deciding the method of teaching.

In the current study, a variation of scaffolding teaching technique was utilized to introduce a series of biological concepts in an anatomy and physiology course in forms of case discussions. The primary goal of the study was to actively engage students in the learning process and allow them to build upon what they already know in order to arrive at something they do not know. We approached this goal by presenting specific topics in didactic lectures followed by one or more case studies directly related to the topic and report the effects of this approach on students' performance and perception. In this report, the case studies are simply defined as stories that contain certain biological message that needs to be understood by the students in order to enable them solving a real life scenario.

The current study primarily focused of two parameters, 1) students' perception of teaching approach by conducting a survey, and 2) students' comprehension of the subject matter by analyzing their response to a pre-selected group of exam questions. Students' perception was determined by a questionnaire that was designed to assess students' opinion regarding the application of case studies in the course. The survey questions were structured to generate information regarding the attitude and opinion of the students towards the case discussions. By far, the majority of students favored the addition of case studies to the traditional didactic lectures, which by itself makes it an attractive teaching approach. Students' comprehension was determined by analyzing the students' response to exam questions. The results suggest that the application of case studies and class discussions improve the students' response to selected exam questions. This was evident by 17% increase in students' average score (Figure 2). Of course, one cannot rule out the possibility that the students' improvements in fall 2007 and spring 2008 may simply be

a natural result of spending a greater amount of time on case related topics, which in turn may improve the students' score. The author acknowledges this possibility and considers it a limitation of the current study; however, it is important to point out the students needed to extrapolate the correct answer from each case in order to correctly answer the questions, and students were not directly given the answer to exam questions in the class discussion. This finding by itself suggests a deeper level of comprehension of the subject matter.

Successful transmission of information, while teaching basic sciences, depends on the active involvement of the students in the construction of their own knowledge (9, 8, 21). Active involvement of students in their own education is a key for the transition of theory into practice (12, 19). The current study demonstrates that the addition of case studies to didactic lectures has the ability to facilitate this transition by raising the students' level of interest and involvement in their own education. The results also confirm the previous reports that suggest a combination of traditional lectures and case study discussions to be an effective and valuable teaching strategy (7, 10, 12 and 20).

To succeed in teaching students with case studies, one cannot overemphasize the importance of a friendly and genial class atmosphere since initially some students may feel intimidated working with other students in a group discussion. The active participation of students in solving the cases is the key factor for the success of case-oriented teaching approach (9, 17 and 19). In the current study, as more cases were introduced; more students were at ease in class discussions and became actively involved in the case analysis. The current study also highlights the effectiveness of teaching biology by applying such concepts to real life situations. By placing the students in a decision-making position as the primary investigators, students are encouraged to analyze the situation in greater depth in order to rationalize their decisions before reaching any conclusions. As it has previously been reported, this approach fosters active participation of students in their own education and giving students a chance to acquire knowledge through an interactive discussion with their classmates (8-10, 12, 19).

Class discussion not only allows the students to develop problem-solving skills through facilitated dialogue, but it also sets the ground for developing confidence in problem solving skills in future careers. For undergraduate nursing students, learning to think like a nurse means learning to do both analysis and synthesis individually and/or with a group of co-workers. Whole class discussion of case studies, the method that was used in the current study, accomplishes this goal by allowing students to incorporate their classmates' ideas into their own before reaching any conclusions.

In summary, while there is no single method of teaching that can ensure thorough understanding of biological concepts for all students, the current study confirms that a prudent combination of didactic lectures augmented with case studies may serve as an effective teaching strategy in the human anatomy and physiology courses. This approach is based on scaffolding principle and encourages the active participation of the students and is well regarded by the majority of the students. The rapidly changing nature of healthcare professionals' education substantiate the application of such simple but effective teaching strategies, which regardless of the students' background and level experience, improves their level of comprehension and interest in the subject matter. Among students who are interested in health related fields, this approach will be particularly beneficial for the students' transition from an academic setting into the clinical setting and ultimately patient management.

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The Dilemma of Once-a-Week Courses: Challenges and Suggested Adjustments

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Abstract:
Once-a-week courses that meet face-to-face are increasing in number even while classroom pedagogy experiences transformation in the 21st century. This is perhaps especially true in the regional campus setting where many students have a number of additional responsibilities and are attracted to courses with limited face-to-face interactions. In this paper, the authors introduce challenges of once-a-week courses that were identified by foreign language faculty and students through informal faculty interviews and a student opinion survey. The authors suggest adjusting students' work to facilitate interaction and foster positive learning experiences in such courses. With these proposed adjustments, the gap, or length of time between classes, could be shortened. The dilemma of once-a-week Spanish courses discussed in this paper could stimulate reflection among instructors faced with similar challenges.

Key words: interaction, once-a-week classes, lack of classroom contact, learning gap.

Introduction

Students at regional branches of universities are often enrolled in Spanish courses to meet program requirements and/or to be able to better communicate with colleagues in the work force. Rather than being the focus of their time, then, the Spanish course is something they have to fit into a schedule that is already filled with other program-specific coursework and/or work responsibilities. Many service departments, like the Foreign Language (FL) department at the University of Cincinnati-Blue Ash College (UCBA), realize this and try to meet the needs of the students by offering sections of courses that meet at different times of the day and in different variations (three

times a week, twice a week, or once a week). One variation that exists is the once-a-week course, which has been popular with students for many years.

While once-a-week courses may be popular with students, they have many limitations. In a discipline where frequent teacher-student and student-student interaction is necessary to promote engagement, increase understanding of input and to refine output, meeting with students once weekly is not enough. Because of the limited class meetings, much of the in-class time is spent covering course content, which decreases the time that students are able to communicate in the language. Additionally, while students should interact with the course content during the week it sometimes appears as though they only do so the five minutes before the next class.

We realize that, although there are pedagogical challenges in teaching once-a-week courses, they are here to stay. So instead of lamenting the lack of time we have with the students, we began wondering how our students perceive this gap between classes in terms of their learning. We also wondered if our perceptions of how students are spending the out-of-class time are correct. Additionally, we wondered about what strategies we could implement and what strategies our students could implement to lessen the effects of this gap in time.

In this paper, we discuss a project in which we asked instructors and students to identify challenges in and limitations of once-a-week language courses. The purpose of this project was to collect information about our students and courses to strategize possible adjustments in our teaching that could be used to shorten the gap between classes, thus increasing interaction and engagement with the course content. We consider this to be a preliminary project for a line of research that we are developing based on what we've learned. We hope that this project will spur others to think about the challenges that they face teaching this type of course and what they could do to mitigate them.

Input and Interaction

As instructors of once-a-week Spanish courses we know that

the limited face-to-face interaction can be influential in the process of teaching and learning. In our once-a-week courses, students have mentioned the difficulty that they have in retaining the course content from week to week. Additionally, students point out differences between once-a-week courses and courses that meet more often. Specifically, students indicate that when they have enrolled in Spanish courses that meet more often, they feel more immersed in the language because they have more time to practice with it. While little has been said about the effects of once-a-week courses on the process of teaching and learning in the literature, there has been much research on the importance of input and interaction in language courses.

In his input hypothesis, Krashen (1985) posits that we acquire language only when we are exposed to comprehensible input. Comprehensible input includes language that contains structures that "are a little beyond" (i + 1) the learner's current level of competence while still being comprehensible because of our use of context, our knowledge of the world, and other extra-linguistic cues that are directed at us. Often, this comprehensible input is provided by instructors and/or other classmates in a classroom setting.

Many researchers have expanded on the input hypothesis to include interaction. For example, Long (1981) argues that it is not only the input that enhances comprehension; it is the interaction between speakers. How is a student to know whether or not he or she has understood and acquired the language enough to be comprehensible to someone else? Long suggests that it is through conversational modifications and clarifications that better comprehension is attained. This comprehension can only occur if one is interacting with another interlocutor.

Other researchers have noted that it is not the comprehensible input that is important, rather it is the incomprehensible input (Gass, 1997; White, 1987). White defines the incomprehensible input as modifications to one's own language because something is incomprehensible to someone else. Gass (1997) and White (1987) both state that when speakers realize that they are not being understood by someone else this will lead to self-correction. If the misunderstandings happen more than once, the speakers will become aware that there

is an aspect of the target language that they do not comprehend. Once they have corrected this misunderstanding they will be able to have comprehensible output (Swain & Lapkin, 1995). Without the interaction between themselves and others, though, the speakers would not recognize this incomprehension.

Vygotsky's (1978) Zone of Proximal Development (ZPD) is a theory that complements the input hypothesis. In the ZPD, students are paired with partners who are more capable than them. In a language class, then, these partners would be able to provide comprehensible input that would improve the language skills of their partner. The interaction between students and/or the instructor is instrumental in Vygotsky's ZPD.

Sociocultural theory, which stems from Vygotsky's work, moves education from an individual standpoint to a perspective that emphasizes the ways in which culture, social roles, and language affect the development of learners (Graboic, 2007; Overfield, 2007). This theory argues that knowledge gradually emerges through joint construction by the learner in relation with others. Once this knowledge emerges, it is distributed among all participants (Salomon & Perkins, 1998). While the debate between cognitivist and sociocultural camps in all areas of pedagogy continues, in the field of second language acquisition, the importance of language socialization has been revisited and explored in recent years. Watson-Gegeo (2004)'s paradigm explores the reconsideration that cognition originates in social interaction and that it is shaped by cultural processes.

Our experiences have taught us that input and interaction are only two important aspects of teaching and learning a language. We recognize that other factors like personal motivation, self-determination, and a low affective filter also play an important role. With decreased face-to-face interaction in the classroom, though, many questions around input and interaction abound. On their own time, do students take the initiative to interact with the course content? How do they think the gap between classes affects their comprehension? What can we, as instructors, do to shorten that gap? What can the students do to shorten that gap? In the project described below, we begin exploring

these questions.

Project Description

This project was conducted at the University of Cincinnati-Blue Ash College during the 2010-2011 academic year. We consider this an exploratory project that will help guide our future research in this area. Our literature search on once-a-week courses did not yield any results specific to this topic. Therefore, we decided to gather preliminary information through informal faculty and student interviews and let that information direct us to areas of research for future projects.

Participants

The courses selected for this project included undergraduate students who were enrolled in once-a-week, first-year Spanish courses. These courses take place during the evening. The average number of students per class is 12. The student population comprises traditional and non-traditional students. The instructors interviewed for the project were all highly skilled instructors, with five to ten years of experience in teaching once-a-week courses.

Interviews and Surveys

All four instructors interviewed were teaching once-a-week courses at the time. Three students, chosen at random, were interviewed. These interviews were used as a preliminary step to gather general information on students' and instructors' views on once-a-week courses. This information was then used to construct a student survey. The one-on-one interviews were informal, open-ended and based on one question. What kind of challenges do you encounter teaching once a week Spanish classes? for instructors and what kind of challenges do you encounter taking once a week Spanish classes? for students.

The student survey consisted of 22 questions that inquired about students' preferences in regards to contact time, students' views on the effects the once-a-week contact had on their learning, and students' study habits. The same questions were asked several times in positive and negative form to minimize bias. To answer the questions, students had four options ranging from totally agree to totally disagree. The survey data was gathered by administering the survey to three classes

with a total enrolment of 37 students. Class 1 had 11 students, class 2 had 10, and class 3 had 16.

Interview responses.

In the interviews, all four instructors indicate similar challenges in teaching once-a-week courses. Specifically, the instructors mention their concern with the students' lack of retention from class to class and students' disengagement between classes. This situation is intensified by absenteeism and by the delayed feedback students receive on their assignments. For example, if a project is assigned on week 1, it will be turned in on week 2 and students will receive feedback on week 3, almost two weeks after they have worked on the project. Instructors also report that planning classes becomes difficult. There is extensive material to cover in one class period and it is complicated to maintain students' attention during long periods of time. Recycling material every class is virtually impossible due to having to introduce new content to comply with the curriculum. Each course is expected to cover the same material so students can change sections the subsequent academic term without having missed anything.

In the student interviews, students demonstrate concern about the lack of class contact and the lack of available feedback. They report that retaining material is difficult and they find themselves cramming the material for assessment. The students admit that their busy personal schedules and lack of organization may intensify these problems.

In the interviews, both instructors and students express similar concerns. Both groups comment on the difficulty of retaining course content and the lack of immediate feedback that the students experience. The two groups struggle with the course content. The instructors report that planning for classes becomes difficult because of the amount of material needed to be covered in order to comply with the curriculum. The students find themselves cramming the material before quizzes or exams because they are not able to plan between classes.

Open-ended survey responses

In their responses to the open-ended portion of the survey, students echo some of the same concerns mentioned in the faculty and student interviews. The open-ended question asks what they find most challenging in taking a once-a-week course. Students indicate that retention of extensive material is difficult for them. They also report that they feel that the material is crammed into the class before the exams. Some of the students state that they feel that the topics are unclear. Many of the students mention the lack of class contact as the most challenging aspect of the once-a-week courses. Some students recognize their own schedule and lack of organization as the obstacles to their success. In relation to this, the lack of available feedback is recognized by many as a hindrance.

Although one student mentions that taking a course once a week allows him or her the opportunity to review material on his or her own time, the majority find only challenges and limitations in a once-a-week course. Below are selected comments, taken verbatim from the open-ended question on the survey:

- It can be difficult to retain the information each week. But as an adult, I am fully capable of setting aside time each week to study outside of class.
- An entire week is a long time to remember.
- The most difficult challenge I encounter by taking Spanish once a week is being able to remember and retain information from the previous class.
- A lot of information is covered in one class. This is overwhelming at times.
- The lack of face to face interaction with the professor.
- I feel rushed.
- I end up putting off all of my assignments until the day of the quiz.
- Being able to speak in class. It would be nice to speak and practice.

Survey responses

The answers from the students' survey were assigned to eight different groups based on the question's topic. The following are the groups: Group A- Students wish they had more contact, Group B- Students believe the gap between classes has a negative effect on their learning, Group C- Students believe the gap between classes has no effect on their learning, Group D- Students study more than three hours per week. Group E- Students study during the week, Group F- Students study only before class, Group G- Students study only before a quiz or exam, and Group H- Students use the online resources.

Group A —Students wish they had more contact. The majority of students report that they do not wish to meet more days a week. Class 1 (43.18% agree, 56.81% disagree) and class 3 (31.25% agree, 68.75% disagree) do not prefer to have more contact time during the week. Class 2 (62.5% agree, 37.5% disagree) is the only group that expresses a desire to meet more than once-a-week.

The students' answers for the questions in group A correlate with the students' answers for Group B—Students believe the gap between classes has a negative effect on their learning.

Class 1 and class 3, which do not wish to increase the hours of contact per week, believe that the gap between classes does not have a negative effect on their learning (class 1:36.36% agree, 63.63% disagree and class 3: 12.5% agree, 87.5% disagree). On the other hand, class 2 (55% agree, 45% disagree), which would like to increase the hours of contact per week, is the only group where the majority of students believe that the gap between classes has a negative effect on their learning.

The students' answers for Group C—Students believe the gap between classes has no effect on their learning correlate with the students' answers for Group B. Class 1 and class 3, which believe that the gap between classes does not have a negative effect on their learning, also agree with the notion that the gap between classes has no effect on their learning (class 1:72.72% agree, 27.27% disagree and class 3: 79.16% agree, 20.83% disagree). On the contrary, class 2 (43.33% agree, 56.66% disagree), which believes that the gap between classes has a negative effect on their learning, also considers that the

gap between classes has an effect on their learning.

Group D —Students study more than three hours per week. The majority of students report that they study more than three hours per week. Class 2 (55% agree, 45% disagree) and class 3 (71.87% agree, 28.12% disagree) disclose studying more than three hours per week. Class 1 (13.63% agree, 86.36% disagree) is the only group where the majority of students reveal studying less than three hours per week.

Group E — Students study during the week. When the questions do not inquire about a concrete number of hours of study, we see that the majority of students report studying during the week. Class 2 (70% agree, 30% disagree) and class 3 (64.58% agree, 35.41% disagree). In class 1 (48.48% agree, 51.51% disagree), compared to the percentages on group D, we see an increase on the number of students saying that they study during the week. However, the majority of students in class 1 report not studying during the week.

The students' answers for Group F —Students study only before class — correlate with the students' answers for Group D and E, which report studying during the week. Class 2 and class 3 that report studying during the week, report on questions in group F that they do not study only before class (class 2:10% agree, 90% disagree and class 3: 18.75% agree, 81.25% disagree). Class 1 (72.72% agree, 27.27% disagree), which discloses not studying during the week, reports on questions in group F that they only study before class.

The students' answers for Group G—Students study only before a quiz or exam— correlate with the students' answers for Group F that relate to students studying only before class, and with the students' answers for Group D and E that report studying during the week. The same classes that report studying during the week, report not studying only before class, and now report not studying only before a quiz or exam (class 2: 20% agree, 80% disagree and class 3: 31.25% agree, 68.75% disagree). In class 1, and in agreement with students' answers for groups F, D, and E, the majority of students (72.72% agree, 27.27% disagree) report only studying before a quiz or exam.

Group H—Students use the online resources. The majority of students report using the online resources. Class 2 (75% agree, 25% disagree) and class 3 (78.12% agree, 21.87% disagree) use the online

resources. In class 1, the group is divided equally (50% agree, 50% disagree).

Discussion of survey responses

In spite of the instructors' reported reservations in the interviews and the students' negative comments on the open-ended portion of the survey, the survey results indicate that the majority of students are satisfied with the contact time and they feel that the gap between classes does not affect their learning. Additionally, the majority of students report studying during the week for some time. Only one group reports studying only before class or only before exams. Students in class 1 do not wish to increase contact time nor do they feel that the gap negatively affects their learning. In fact, they indicate that the gap between classes has no effect on their learning. This group reports not studying during the week, only before class or exams. Fifty per cent of the students use the online resources. Class 2 is the only group that wishes to increase contact time and feels the gap negatively affects their learning. This group reports studying during the week, not only before class or exams. Ninety per cent of the students in the class use the online resources. Class 3 does not wish to increase contact time and does not feel the gap negatively affects their learning. They believe the gap between classes has no effect in their learning. This group reports studying during the week in addition to before class or exams. Seventy-eight per cent of the students use the online resources.

Future Research

After discussing the information gathered the next step in this project is developing a double study in two different courses (four different sections). The first part of the study will compare the language skills development of students enrolled in a once-a-week course to the language skills development of students enrolled in the same course but in a section that meets multiple times a week. The second part of the study will contrast students' language skills development in two once-a-week courses. One section will have adjustments to the students' work to increase comprehensible input and interaction throughout the week. The other section will be taught as it

is currently taught, with no modifications.-

In preparation for the development of adjustments to student work we will use, we have created a preliminary list of goals that we feel speak to the concerns and issues that students and instructors raised. We have also brainstormed ideas that can be used to create activities to bridge the gap between courses and keep students engaged in the course content. Finally we have generated sample activities that are related to these goals and ideas.

The underpinning purpose of the adjustments is to shorten the length of time that students spend without receiving comprehensible input or interacting with the language. Below is the listing of goals, ideas, and suggested activities:

Shortening the Gap Between Classes: Classroom Activities

Goal	Idea	Sample Activities
Maintain interest in and/ or engagement with the language	• Students complete cultural activities. • Students attend cultural events. • Students listen to a radio program or watch a tv show. • Students identify a famous person of interest from the target culture and follow him/her on Twitter. • Students listen to a song/band from the target culture and	Assign a country to each student. Each student has to create a menu for a dinner party using the typical food of the country. Assign TV shows for the weekend (http://www.rtve.es) students write a synopsis or review about the show or write 5 things that they understood about the program.
Cover specific course content	Students complete assignments on online-based workbook and lab manual.	Students complete the assignments on due dates BEFORE the next class.
Create time for in-class interaction	Students are assigned the grammar reading for outside reading and study.	At the beginning of the class time the students close their books and are asked close-ended questions to check for understanding. There is no specific grammar instruction unless there is misunderstanding of the concept; students begin interacting with each other using the language.
Provide additional input.	• Students watch a movie. • Students read a news article.	Assign roles: one is the actor and one is a talk show host. The "talk-show host" must develop questions and the "actor" must research background information about the movie and personal information to prepare for the interview.

Increase interaction.	• Students interact with one another through information gap activities on Blackboard, Skype, blogging, etc. • Students become each other's text-pals. • Students engage in service-learning experience. • Students interview a native speaker.	Information gap activity: Both students have television schedules with information missing. The students question each other to complete the schedule.

Conclusion

While once-a-week courses are popular, especially to students at regional branches of universities who are often enrolled in them to meet program requirements, there are limitations and challenges that the instructors of such courses must try to alleviate. In a language course where frequent teacher-student and student-student interaction is necessary and a great deal of content must be covered, the limited class meeting times can be frustrating to both students and instructors. Rather than mourn that which we do not have, we decided to do research in this area beginning with an exploratory project in which we collected information about instructors' and students' perceptions of the gap between courses that meet once a week. We learned that while instructors and students express dissatisfaction with such courses in interviews, the majority of students' survey responses indicate that they feel that the limited in-class interactions have no negative effect or no effect at all on them. These responses have given us insight on what our next step should be. We have developed a design for a double study that will compare the language development skills of students and which we will complete this year. The goal is to explore if the gap and reduced interaction in once-a-week courses plays a role in language skills development or has no effect. We hope that the information provided with this preliminary project will encourage reflection about once-a-week courses in foreign languages and other disciplines. We welcome any feedback educators may wish to provide and we invite others to develop studies into this much neglected area.

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