

FY2009 Learning Technologies Grants Proposal
(COVER PAGE)

Project Information

IM-CHEM

Project Title

Charles H. Atwood

Project Director

Chemistry

Requesting Department

\$2939.00

Amount Requested Year 1 (≤\$15,000)

\$0.00

Amount Requested Year 2 (≤\$15,000)

Project Director's Signature

Proposal Endorsement Signatures

Department Head

Dean

Proposal Abstract (100-word maximum)

Some freshman students in CHEM 1211 and 1212 are too intimidated by the 360 person class size to ask questions leading to their getting lost in lecture. We propose using dedicated Instant Messaging devices in class permitting students to ask questions without intimidation. Their IM's would be routed to a graduate student sitting in the classroom who would answer their question. If several students ask the same question, the graduate student will inform the lecturer to address the question. By eliminating confusion and intimidation, we hope to increase student performance and success rates while decreasing withdrawal rates in general chemistry.

Section I. Project Description

Freshman Chemistry, CHEM 1211 and 1212, is a large service oriented course which acts as a gatekeeper course for all students interested in pursuing careers in science, medicine, dentistry, pharmacy, or veterinary sciences. These courses are taught to approximately 1800 students per semester. Lectures for these courses are given in large classrooms (rooms 400 and 430 in Chemistry) holding up to 365 students.

It is the sheer size of these classrooms which intimidates approximately 35% of our students. More than once instructors for these classes have heard freshman students make the statement, "There are more students in this one classroom than graduated from my high school this last year. I am too scared to ask a question." Intentionally, we inform students at the start of fall semester that we expect them to ask questions in class and that they will not be ridiculed, mocked, or humiliated. However, the students must also understand that in these size classes the instructor may not understand exactly what they are asking so they must be prepared for us to ask them clarifying questions. While we have tried several techniques to downplay the size intimidation factor, there are still some students who are petrified of raising their hands in class and exposing themselves to the judgment of 364 other students. In this project we will attempt to address the needs of those students who are still too intimidated to raise their hands.

Our plan is to purchase 26 dedicated instant messaging devices which will be available in class for the students to use. These devices will be logged into the MSN Instant Messaging service and directed to a computer situated near the front of the classroom. One of our graduate students, Mr. Derek Behmke, will be stationed at this computer to answer the students' questions as they are asked. If Derek recognizes that several students are asking the same question, he will direct a message to the lecturer. Then the lecturer will recognize that he/she needs to return to that point for further clarification. In this fashion, we hope to let our shy students interact with the instructor to resolve their outstanding questions.

It may occur to you why not let the students do this using their cell phones or laptop computers? One problem we have with in-class learning is keeping our students focused on that day's work. If cell phones are openly used in class, many students would focus upon the text messages from their friends and not upon what is occurring in the classroom. We believe that by limiting students to our IM devices we can focus their attention upon learning chemistry, including getting their burning questions asked, without introducing more classroom distractions. The instant messages sent and received on the devices can be controlled using the administrative privileges within the software.

Nature of the Innovation

We will use dedicated instant messaging devices to permit students to ask their questions during lecture. These dedicated devices will point solely at our in-house computer where a chemistry graduate student will answer their questions in real time. Dedicated IM devices will permit those students who feel intimidated by large classroom sizes to ask their questions in a non-embarrassing fashion without introducing the attention diverting cell phones. If the graduate student realizes that several CHEM 1211 or 1212 students have the same question, an IM will be sent to the instructor informing him/her of the question. The instructor will then address the proposed question in class alleviating the students' concerns.

Need/Rationale

CHEM 1211 and 1212 are true gatekeeper classes for many students. The Chemistry Department has made a concerted effort to improve these courses and increase student success rates while maintaining high learning standards. For example, in 1997 the withdrawal rate from CHEM 1211 was typically 30%. For the last 8 or 10 years, the withdrawal rate has decreased to 15% due to the Department's efforts. In this proposal we are aiming our sights upon lowering the withdrawal rate further by addressing those students who are too intimidated by large classrooms to ask their questions. We believe that if they can get their questions answered in real time, some of these students will not get behind during class alleviating some of their mental frustration and improving their success rate.

Relevance of the Project to Unit and University Priorities

Student success in gatekeeper courses, particularly freshman courses, is not only a University priority but has been highlighted by the Board of Regents. Over the course of the next few years the Board expects withdrawal rates to drop to less than 10% along with a concurrent increase in A's, B's, and C's. This project is one of our initial attempts to meet the BOR's mandate.

The Chemistry Department also expects success from its students. While the Department is happy with the decrease in W rate and subsequent increase in student success rate, it would like to see those numbers continue to improve. Many of the University's programs depend upon receiving students who succeed in this course. CHEM 1211 and 1212 students not only go into numerous pre-professional programs but also take subsequent courses in biology, agriculture, forestry, and virtually every other science related course at UGA. Improving our success rate in CHEM 1211 and 1212 can only pay dividends throughout the University.

Specific Courses or Student Groups Benefiting from the Project

CHEM 1211 and 1212 which have ~1800 students per semester.

Number of Students Served, Including Undergraduate, Graduate/Professional or Both

CHEM 1211 and 1212 are large service classes having ~1800 undergraduate students per semester. While not every student in the class will use the IM devices, we estimate that about 35% of the students will take advantage of the opportunity.

Section II. Budget

List technology, facilities, and other resources requested

26 dedicated instant messaging devices. We have researched the possibilities for these devices determining that the Zip-It device is best for our use. With 26 devices we will have one IM device per every 2 rows of students, which is equivalent to 1 device for every 14 students.

1 dedicated 13'' Mac Book 2.4 GHz

LTG Budget

Item	Quantity	Total Cost	Requested from LTG	Provided by Other Sources
Zip-It IM devices	26	\$3510	\$1640	\$1870
Mac Book	1	\$1299	\$1299	
TOTALS	27	\$4809	\$2939	\$1870

Budget Justification Narrative

For this project we require 26 Zip-It devices to give the students access to the internet messaging system. Our graduate student, Derek Behmke, will sit in a desk at the front of room 430 where the messages will be received and read. Then he will compose a response to the student questions or direct these messages to the instructor, Dr. Atwood. We will need a fast and reliable computer to answer the messages but this computer will also collect the data on student questions, concerns, identify students, and so forth for the evaluation phase of the project. We have already ordered 14 ZipIts using Dr. Atwood's Senior Teaching Fellows allotment of \$2000. We need to order the remaining 12 to complete our total set of 26.

Project Timeline

Date (mm/yy)	Objective	Person(s) Responsible
07/08	Order 14 IM devices,	Derek Behmke
08/08	Install software, initialize service, prepare computer, insure that devices work	Derek Behmke
08/08 - 09/08	Begin project	Derek Behmke
09/08 – 05/09	Continue project and evaluate effect	Derek Behmke

Section III. Learning Outcomes

Learning Outcomes and How Resources Will Be Used to Achieve Outcomes

It is our belief that using these IM devices in our class room will enable the students who are intimidated by the classroom size or by fear of exposing their lack of understanding a way to privately ask their questions. In this fashion, these students will not be so isolated getting their questions answered as the class is conducted. We know that many of these students get frustrated with their inability to have their questions answered, get behind in class, eventually withdrawing or failing as a result of these compounding issues. The IM devices will provide these students an in-class, real-time, anonymous method to ask and have their questions answered. Derek is presently a chemistry graduate student but was previously a high school chemistry teacher in Rockdale County. He can readily answer their questions as well as decide when their questions need a larger response to the entire class. By having him positioned at the front

of the room we wish to assure these students that we take their needs seriously and are doing our best to address them. We hope to see an improvement in these students' grades, class interest, and success rate as measured both by the withdrawal rate and improvements in the numbers of A's, B's, and C's in the class.

Methods for Evaluating the Project and Learning Outcomes

In the fall semester of 2008, we will initiate this project in one section of CHEM 1211 taught by Dr. Atwood. There is a second section of CHEM 1211 also taught by Dr. Atwood in fall semester which will be our control group. Furthermore, there are another three sections of CHEM 1211 taught in fall semester by other instructors that can provide more control groups.

Over the last 8 years we have collected longitudinal data on student performance in CHEM 1211 and 1212. We have performed Item Response Theory analysis on every test question given over this period. We understand with great accuracy which topics cause our students the most problems in both CHEM 1211 and 1212. We also know the ability levels of our past students and can correlate that with questions/topics that they miss due to lack of understanding. If there is a significant change in student performance that can be attributed to how we conduct one particular section, we will capture that information in a convincing statistical fashion.

All of our work has been approved by the University's IRB and we have already indicated to the Review Board that we intend to institute this project. Derek will capture the names of every student who IM's him during class as well as the questions they have. He will also determine the group attributes of the students who use the IM device in class. From this data Derek will perform statistical analyses (including Classical Test Theory, Item Response Theory, t-tests, differential item analysis, and other valid analyses) to ferret out the effects of IM-CHEM. We predict that the net result will be a measurable improvement in these students' performance in CHEM 1211 this fall semester. Assuming that is the case, we will then export this project to all subsequent sections of CHEM 1211 and 1212.

Potential Applications in Other Academic Areas

If this project works as predicted, it can be exported to any large classroom at UGA provided that the instructors are willing to try it out.