


Document
of Innovations

2000

Compiled by the
Teaching and Learning
Center 

Contents

	page
Types of Innovation	iii
Evaluation of Students	iii
Reflection on Learning	iii
Student Research	iii
Teaching and Learning Activities	iii
Active Learning	iv
Collaborative Learning	v
Using Technology	v

Introduction	1
---------------------	----------

Featured Innovators	Title of Innovation	
Adams, Mignon S.	Teaching a "Hybrid" Online Course	2
Anderson, Joan M.	Attendance Survey	4
Aurora, Tarlok S.	Reading Comprehension in a Physics Course	6
Aurora, Tarlok S.	Using the Internet in Physics for the Health Care Professions	8
Ditunno, Patricia L.	Autobiographical Memory Project	9
Ditunno, Patricia L.	Cognition Pilot Research Project	11
Dittuno, Patricia L.	Data Comparisons	13
Halpern, Paul	Facing Time: An Interactive Approach to the Study of Time Perception	14
Ideishi, Roger, Santalucia, Susan Collier, Gina	Learning Through Community and Technological Occupations	16
Iglarsh, Z. Annette	Student Developed Portfolios and Grading by Contract	18
Johnson, James R.	The "Plague" Simulation	20
Kimchuk, Amy	Graphing Calculators in Mathematics	22
Kimchuk, Amy	Mathematics Research Paper	23

Lambert, Joseph V.	Interteach	25
McVeigh, Jeanette	Web-based Information	27
Miller, Peter J.	Problem-Based Learning Activities in a Kinesiology Course	29
Mostrom, Alison M	Surfing the Zoology Internet	31
Peterson, Andrew	Use of computer based testing in the Pharmacy systems management course	33
Reilly, Barbara	Assignment using Excel and Individualized Data in Regression Analysis	35

Featured Innovators	Title of Innovation	page
Reilly, Barbara	Combined Journal Research, Knowledge of Probability Concepts, and Test Question Construction	37
Reilly, Barbara	Group Mathematics Laboratory Assignment with Multiple "Correct" Solutions	39
Reilly, Barbara	Peer Evaluation of Research Presentations	41
Reilly, Barbara & Seigel, Carole Ann	Textbook to Address the Particular Algebra and Function Review Needed by USIP Students	43
Schemm, Ruth	Using the past to analyze present practice dilemmas	45
Tietze, Karen J.	Competency-Based Student Assessment	47
Tietze, Karen J.	Integrated Lecture, Literature Assessment And Patient Care Application	49
Umland, Elena M.	Guided Journal	51
Submission form for 2001 Document of Innovations		53

Types of Innovations

<u>Evaluation of Students</u>	page
Anderson, Joan M. - Attendance Survey	4
Aurora, Tarlok S. - Reading Comprehension in a Physics course	6
Iglarsh, Z. Annette – Student Developed Portfolios	18
Lambert, Joseph V. – Interteach	25
Peterson, Andrew M.– Computer-based testing	33
Reilly, Barbara – Assignment using Excel	35
Reilly, Barbara - Combined Assignment	37
Reilly, Barbara - Peer Evaluation	41
Schemm, Ruth - Using the past	45
Tietze, Karen J.– Competency-based evaluations	47
Umland, Elena M.- Guided Journal	51

Reflection on learning

Aurora, Tarlok S.- Internet Physics	8
Ditunno, Patricia L.- Autobiographical Memory Project	9
Ditunno, Patricia L. - Data Comparisons	13
Ideishi, et.al., - Learning Through Community	16
Kimchuk, Amy- Graphing Calculators	22
Umland, Elena M.- Guided Journal	51

Student Research

Ditunno, Patricia L. - Cognition Pilot Research	11
Johnson, James R. - The Plague Simulation	20

Teaching Learning Activities

Adams, Mignon S.- Hybrid- Online course	2
Aurora, Tarlok S.- Internet Physics	8
Ditunno, Patricia L.- Autobiographical Memory Project	9
Ditunno, Patricia L. - Cognition Pilot Research	11
Ditunno, Patricia L.- Data Comparisons	13
Halpern, Paul - Facing Time	14
Ideishi, et.al., - Learning Through Community	16
Iglarsh, Z. Annette- Student developed portfolios	18
Johnson, James R.- The Plague Simulation	20

Teaching Learning Activities Cont.

	page
Kimchuk, Amy- Graphing Calculators	22
Kimchuk, Amy - Math research paper	23
Lambert, Joseph V. - Interteach	25
McVeigh, Jeanette - Web-based Information	27
Miller, Peter J.- Problem-based learning	29
Mostrom, Alison M. - Zoology Internet Surfing	31
Reilly, Barbara- Assignment using Excel	35
Reilly, Barbara- Combined Assignment	37
Reilly, Barbara- Group mathematics laboratory	39
Reilly, Barbara, Siegel, Carole Ann- Textbook	43
Schemm, Ruth - Using the past	45
Tietze, Karen J. - Integrated lecture, literature assessment	49

Active Learning

Adams, Mignon S.- Hybrid- Online course	2
Ditunno, Patricia L.- Autobiographical Memory Project	9
Halpern, Paul- Facing Time	14
Ideishi, et.al., - Learning Through Community	16
Iglarsh, Z. Annette - Student developed portfolios	18
Johnson, James R. - The Plague Simulation	20
Kimchuk, Amy- Graphing Calculators	22
Lambert, Joseph V. – Interteach	25
McVeigh, Jeanette - Web-based Information	27
Miller, Peter J.- Problem-based learning	29

Mostrom, Allison M. – Zoology Internet Surfing	31
Reilly, Barbara- Combined Assignment	37
Reilly, Barbara- Group mathematics laboratory	39
Reilly, Barbara- Peer Evaluation	41
Reilly, Barbara Seigel, Carole Ann - Textbook	43
Schemm, Ruth- Using the past	45
Tietze, Karen J. - Integrated lecture, literature assessment	49

Collaborative Learning

page

Ditunno, Patricia L. - Cognition Pilot Research	11
Ideishi, et.al., - Learning Through Community	16
Johnson, James R. - The "Plague" Simulation	20
Lambert, Joseph V. – Interteach	25
Miller, Peter J. - Problem-based learning	29
Reilly, Barbara - Group mathematics laboratory	39
Reilly, Barbara- Peer Evaluations	41
Tietze, Karen J. - Integrated lecture, literature assessment	49

Using Technology

Adams, Mignon S. - Hybrid- Online course	2
Aurora, Tarlok S.- Internet Physics	8
Ideishi, et.al., - Learning Through Community	16
Johnson, James R. - The Plague Simulation	20
Kimchuk, Amy- Graphing Calculators	22
McVeigh, Jeanette - Web-based Information	27
Mostrom, Alison M. – Zoology Internet Surfing	31
Peterson, Andrew M. – Computer-based testing	33
Reilly, Barbara – Assignment using Excel	35
Schemm, Ruth - Using the past	45

The Document of Innovations in Teaching and Learning at the University of the Sciences in Philadelphia

The Teaching and Learning Center of the University of the Sciences in Philadelphia is proud to produce the first annual document of educational innovations within this university. The aim of these innovations is to improve teaching and learning within our educational programs. The Teaching and Learning Center Advisory Committee endorsed the establishment of "The Innovations in Teaching and Learning at the University of the Sciences in Philadelphia." This document will be disseminated throughout the campus to give increased recognition to individual faculty who strive to improve their teaching as well as to others who assist students to learn more. Hopefully, the document will help faculty in collaborating on new ideas and will inspire others to try new methods to improve their teaching and learning.

All of the innovators welcome feedback on their ideas. If you use or adapt an innovation, please give the author credit and tell that person how it worked.

Additional copies of this document are available in the Teaching and Learning Center, as well on our web page www.usip.edu/teaching.

To submit a description of an innovation for next year's edition, use the submission guide in the back of this document. Please submit an electronic copy.

Phyllis Blumberg, Ph.D.
Director of the Teaching and Learning Center
June, 2000

Title of innovation: Teaching a "Hybrid" Online Course

Name of innovator: Mignon Adams

Telephone number: 215-596-8791 **email address:** m.adams@usip.edu

Department: Information Science

Type of students: Undergraduate, all majors, all years

Course or activity where implemented: IS 105: Introduction to Online Electronic Resources

Describe goals of innovative educational activity

1. To determine if a "Virtual Class" could substitute for an in-person class
2. To give students practice in electronic classes
3. To serve as a first step in creating an entirely online course

Describe the innovation and its implementation

Four of the sessions of IS 105 were chosen to serve as "virtual classes." That is, rather than attending a traditional class, readings and assignments were posted on the course ERes page. The concept of "virtual class" was explained: that it didn't mean that there was "no class" that day, but that the class wouldn't meet.

Reflect on what's working and why it is working

Overall, the classes were effective in that students appeared to learn from them as much as they did other classes. It was necessary to make the assignments more structured, with more examples, than I originally thought. The first time through took much more work than preparing for a class presentation. Future courses should be easier.

Describe student reaction to the innovation

Students liked the idea when it was first explained to them. At the virtual first class meeting, even though it was in the syllabus, I announced it in class, there was an announcement on the course page, several students still showed up for class. After the first assignment, I found that students did not complete the readings, but simply attempted to complete the assignment. Subsequent assignments asked specific questions on the assignment. At the end of the course, students replied that they liked the virtual classes, but agreed that they needed to be very structured.

Will innovation be sustained within the course? Yes

Will you implement this innovation in other courses? No

Describe

This is the only course that I teach.

Other comments

I believe that setting up a few “virtual classes” is an excellent way for faculty members to get their feet wet in distance learning. Four sessions were certainly enough for me to learn much more about how to create learning activities when the students were working on it on their own.

Title of innovation: Attendance Survey

Name of innovator: Joan Anderson

Telephone number: 215- 596-8872 **email address:** j.anders@usip.edu

Department: Pharmacy Practice/Pharmacy Administration

Type of students 1st and 2ndyr

Course or activity where implemented Orientation ("Dean's Seminar", PP181, 283)

Describe goals of innovative educational activity

Take attendance rapidly in large class, which meets only one hour weekly; gather non-confidential information about the students; encourage attendance at all/most class meetings.

Describe the innovation and its implementation

Distribute brief survey about 5 minutes before class, which can be completed in 2-3 minutes and includes each student's name and University ID number. Surveys are sorted alphabetically and presence/absence recorded on grade sheet. Students lose 5 points for unexcused absence. (Course grade is composed of 100 points.)

Reflect on what's working and why it is working

Used on 4-6 occasions (unannounced) throughout the semester, this does not require much class time, but provides pooled data about the class cohort. This information is used in some class discussions, course planning, and program assessment.

Describe student reaction to the innovation

Essentially none. No one has resisted completing the survey (though a form with only the name and ID # would be accepted as evidence of attendance). Random use challenges students to decide whether or not to attend each class meeting.

Will innovation be sustained within the course? Yes

Will you implement this innovation in other courses? No

Describe

I have no other course responsibilities but have shared this strategy with colleagues who may also adopt it for their large classes.

Service Survey

PP283

February 23, 1999

Name: _____

ID#: _____

1. Did your high school require a "community service" activity for graduation? _____

2. Check below the service activities in which you have been involved since you became a college student (either at home or in the campus community)

- _____ meal program at homeless shelter
- _____ collecting food or clothing for homeless
- _____ Habitat for Humanity or similar construction programs
- _____ teaching or tutoring (children or adults)
- _____ adult or child care
- _____ disease-specific volunteer efforts (e.g. cancer, diabetes, immunization programs, etc.)
- _____ other (please describe:)

Title of Innovation: Reading Comprehension in a Physics Course

Name of innovator: Tarlock Singh Aurora

Phone: 215- 596-8911 **e-mail address:** t.aurora@usip.edu

Department: Math/Physics/Computer Science

Types of Students: PY200 "Survey of Physics"

Description of goals of innovative educational activity

To develop reading and understanding of technical material provided during an examination

To be able to answer questions based on the material

To make deductions or implications of the subject of the material provided during the examination

Describe the innovation and its implementation

The physics examination paper contained conceptual questions in Part I. Part II contained problem solving. In addition, subject related material was copied from the text (but not discussed in class). Questions based on this were included in Part I as multiple choice questions. Some questions were straight forward, while the others required the students to think and use their experience/judgement.

Reflect on what's working and why it is working

It worked when the questions were simple. Some students had difficulty with these too. Only some students got the deductive type questions.

Description of student reaction to the innovation

Students liked this portion of the test since they did not have to memorize anything. They had to only understand and interpret the technical information given to them.

Will innovation be sustained within the course? Yes

Will you implement this innovation in other courses? Yes

It enables us to measure students' comprehension of the reading material. It enables us to select the books, which are not too difficult to understand. It also tells us what type of difficulties students have in completing the home assignments.

Other Comments

The results showed that some students lacked understanding of the material they read. I had presented my experiences with this project at a physics conference. Some teachers in the audience told me that it was a good idea and they will go back and implement it in their physics major's programs at their schools/universities.

Title of innovation: Using the Internet in Physics for the Health-Care Professions

Name of innovator: Tarlock Singh Aurora

Phone: 215- 596-8911 **e-mail address:** t.aurora@usip.edu

Department: Math/Physics

Types of Students: PY200 "Survey of Physics" for Occupational Therapy Majors

Description of goals of innovative educational activity

1. To emphasize the importance of physics in the health-care professions
2. To develop skills utilized in exploring the Internet resources in the students
3. To develop technical written skills and analytical ability.

Describe the innovation and its implementation

The O.T. students were asked to explore the Internet to find clinical case studies involving occupational therapy. The students were required to identify and explain the physics principles involved in the injury, diagnosis and the treatment.

Reflection on what's working and why

It worked well since the students were exposed to the work related injury cases and were able to appreciate the importance of physics to their profession.

Describe student reaction to the innovation

The students liked it because it provides a different mode of exploration, analysis and learning in contrast to the classroom instruction.

Will innovation be sustained within the course? Yes

Will you implement this innovation in other courses? Yes

I will implement this innovation in other courses. A similar approach could be used in other courses where the case studies are available. Students may be able (if applicable) to analyze and learn the importance of physics to a case study and possibly to their profession and/or areas of other interests. Freedom of the choice of topic may be given as long as it relates to the course material.

Title of innovation: Autobiographical Memory Project

Name of innovator: P. L. Ditunno, Ph.D.

Telephone number: 215-596-8901 **email address:** p.ditunn@usip.edu

Department: Social Sciences

Type of students: Occupational Therapy , Health Psychology Majors,
Psychology Minors

Course or activity where implemented: Memory, Fall, 1997, Cognition PS329
Fall semester 1998 & 1999

Describe goals of innovative educational activity:

Provide each student with practical application of theoretical knowledge.
Provide each student with a personalized experience as a subject in self-report
data collection.

Describe the innovation and its implementation:

1. Each day, the students must write descriptions of two unique personal events in their diaries
 2. Next to each description students rate its memorability using a 5 point Likkert Scale:
 3. If a student forget to write an event description for a particular day, then (s)he should write "forgot" across the page. (do not enter an event for a previous day on a later day)
- At a two week interval after completion of the journal, an individualized memory test is given to each student and the data are recorded.
 - Students were required to interpret the class data as a final exam question

Reflect on what's working and why it is working:

Students very cooperative

Describe student reaction to the innovation:

"Too much work" Can't believe I forgot to record information so many times

Will innovation be sustained within the course? Yes

Will you implement this innovation in other courses? No

Other comments:

Very time consuming for instructor to individualize memory tests

Title of innovation: Cognition Pilot Research Project

Name of innovator: P. L. Ditunno, Ph.D.

Telephone number: 215-596-8901 **email address:** p.ditunn@usip.edu

Department: Social Sciences

Type of students: Occupational Therapy , Health Psychology Majors,
Psychology Minors

Course or activity where implemented: Cognition PS329 Fall semester 1998 &
1999

Describe goals of innovative educational activity:

Provide each student with “hands-on” research experiential learning opportunity.
Provide each student with a cooperative research experience (to enhance
interpersonal skills and collaborative research experience.

Describe the innovation and its implementation:

Cognitive Processes

Fall 1999

Pilot Research Project

Each student and partner is required to conduct a pilot research project. This project requires that the partners design a research project which addresses a cognitive issue: e.g.: perception, attention, memory, memory enhancement, forgetting, imagery, cognitive styles, problem solving, etc. This project must be an original idea, or a modification of existing research. The students will meet with the instructor to formulate a research hypothesis, design a methodology, and determine a plan for collecting data (at least 20 subjects). After data collection, students will meet with instructor to analyze the data. A research manuscript that includes an abstract, introduction, method, results, conclusion and references (as in a journal article) is a course requirement.

Examples from past student research:

Sleep deprivation effects on “undo” of automatic tasks

Distractor tasks in learning new information (effects of pictures of unclothed individuals)

Music as an enhancer or interference on retention of new learning

Imagery versus Text as processing styles

Influence of subliminal presentation of affect words on memory

Cognitive mapping (map reading performance)

Context, state, mood dependent learning

Retrospective or Prospective Interference on learning

Reflect on what’s working and why it is working:

Seems to be working as some projects have been submitted and accepted for presentation at Annual Eastern Psychological Association Meetings.

Describe student reaction to the innovation:

“Too much work— however more fun than a written library research paper requirement”

Will innovation be sustained within the course? Yes

Will you implement this innovation in other courses?

Would have to be modified to fit the course content ---

Other comments:

Very time consuming for instructor as approximately 17 projects a semester are concurrently supervised

Title of innovation: Data Comparisons

Name of innovator: P. L. Ditunno, Ph.D.

Telephone number: 215-596-8901 **email address:** p.ditunn@usip.edu

Department: Social Sciences **Type of students:** Physical Therapy Students

Course or activity where implemented: PS354 Psycho-Social aspects of Disability

Describe goals of innovative educational activity:

Provide each student with an opportunity to examine own belief systems as they may be projected onto patients.

Describe the innovation and its implementation:

Early in the semester students take several standardized questionnaires, among them are the "Attitudes toward Disabled Persons Survey", "Locus of Control Surveys" and the "Beck Depression Inventory". Each student scores his/her own and records the data anonymously. During the semester the class scores are interpreted by the students, and compared to published data. In particular, each student takes the "Beck Depression Inventory" and later, takes the same inventory role-playing as a patient, age 24, diagnosis Spinal Cord Injury. Students are then required to interpret the differences in the first set of class scores and the role playing class scores, as well as published articles on incidence and/or lack of depressive reactions following spinal cord injury.

Reflect on what's working and why it is working

Students do well on the mid-term exam questions related to this exercise, therefore it seems that they have read the assigned relevant material.

Describe student reaction to the innovation

Students do report that they gain insight into false perceptions about how others should or should not adjust to disability.

Will innovation be sustained within the course? Yes

Will you implement this innovation in other courses? Yes

This is tailored to this course—but in general other types of questionnaires could be used and results compared to published articles

Title of innovation: Facing Time: An Interactive Approach to the Study of Time Perception

Name of innovator: Paul Halpern

Telephone number: 215-596-8913 **email address:** p.halper@usip.edu

Department: Math/ Physics/ Computer Science

Type of students: 2nd Year/ All Majors__

Course or activity where implemented: Intellectual Heritage

Describe goals of innovative educational activity

I developed several "altered temporal experiences" in order to stimulate discussion about the nature of time and to inspire more student interest in the readings. These projects help stimulate students to become more active members of the class.

Describe the innovation and its implementation

In my teaching strategy, students are led to experience several different facets of the flow of time. They do so through interactive games developed to evoke feelings of time alteration. I illustrate a few of these projects:

PROJECT 1: Filled versus Empty Time: Students are divided into two groups. One group is asked to complete an assignment that most students would find interesting (for example, listing their personal feelings about college life). The other group is requested to sit quietly until the first group is finished. At the end of 5 minutes, or so, I ask the students to discuss their varied experiences. Each group estimates how long the time interval lasted. Typically, the more involved group comes up with a shorter estimate. We then discuss how time is affected by activity.

PROJECT 2: Time without Memory: Students are asked to imagine that their memories are exclusively short term (several minutes long). I ask students

to sit in a circle, and to each compose on paper a segment of a story. Each student begins that part of the story solely with the information that he/she receives from his or her classmate on his/her left, and then passes his/her contribution to the person on his/her right. We then read the entire story and note what our experience of time would be like without the aid of memory.

PROJECT 3: The Time Accelerator: Based on the short story, "The New Accelerator," by H.G. Wells, students are asked to relate how they would market a drug that speeds up the flow of time. This launches a discussion of what society would be like if each had his/her own temporal pace.

PROJECT 4: Stopping Time: Students are asked to imagine what they would do if they could bring time to a halt for several hours or days. They describe what their experience would entail.

Reflect on what's working and why it is working

These exercises help turn a theoretical examination of the nature of time into a more active experience. Therefore, by gaining tangible awareness, students "internalize" these concepts to a greater extent than if they just read about these ideas.

Describe student reaction to the innovation

I have found a marked increase in the quality of classroom discussion after these activities. Students seemed more animated and eager to participate. I have also found an enhancement of the personal and emotional content of the course. For example, after the time and memory project, students have described in the class experiences with family members who have memory impairment.

Will innovation be sustained within the course? Yes

Will you implement this innovation in other courses? No

Other Comments

I was pleased to witness the increase level of discussion that these projects apparently stimulated. I would certainly suggest to other instructors breaking up the lecture routine with hands-on projects such as these.

Title of innovation: Learning through Community & Technological Occupations

Name of innovator: Roger I. Ideishi, Susan Santalucia & Gina Collier

Telephone number: 215-596-8499 **email address** r.ideish@usip.edu

Department Occupational Therapy **Type of students:** 3rd yr. OT

Course or activity where implemented: OT 452: Occupational Form & Performance

Describe goals of innovative educational activity:

To identify, understand and appreciate the multi-faceted nature of human activity.

To analyze how humans decide to use time and space.

To analyze how human activity influences the biological & psychological human systems.

To analyze how humans are influenced the sociocultural environment.

To participate in a novel human activities.

To reinforce the professional responsibilities of empathic community service.

Describe the innovation and its implementation:

Community Occupation Module – Student groups are assigned to a socioculturally defined community environment in the Greater Philadelphia Metropolitan Area (i.e. Quakers, Japanese-Americans, Gay & Lesbians, Childcare workers, South Philadelphia, a homeless shelter, for example). Group size is approximately 4-5 students. Students perform one field study of the community each week. Students become participants in the activities of the community to analyze the historical trends and contemporary influences on the activities. The student groups meet each week with a faculty instructor to review, reflect and be guided in their exploration of the community and to ensure linkage between field experiences and concepts from the course.

Human Construction & Performance Occupation Module – Simultaneous to their community modules, each student group rotates through a 4-week series of construction activities to increase their understanding of human performance using tangible objects and materials. The students are instructed in use of hand and power tools. Following competency in tool use, the students are

assigned to a community construction activity (i.e. Habitat for Humanity) to participate and experience the “true” personal and environmental demands of human construction performance.

Technological Occupation Module – Simultaneous to their community modules, each student group rotates through a 4-week series of technological activities to increase their understanding of contemporary technological demands on human activity performance. The students are instructed in the use of basic computer, software and internet technology; and digital and video still and moving photography. Following competency in technological equipment use, the students create a technologically based presentation of their human construction and/or community occupation module. The students are also required to analyze their own personal experience in the technological learning process using biological, psychological and sociocultural components.

Reflect on what’s working and why it is working

This innovation provides the student with a “real demand” personal experience for the student to draw upon rather than abstract discussion in the secluded classroom environment. The personal experience allows the student to begin from his or her framework of human biological and psychological function and social engagement. This initial framework is challenged in the real world and the student transforms his or her own understanding with guidance and exploration via faculty instructors.

Describe student reaction to the innovation

The primary course concept is to understand why and how humans engage in certain activities and occupations. Students initially do not understand the link between the occupation experiences and the course concepts and question the relevance of the course to the field and laboratory experiences. At the midpoint of the course, faculty still do not make the link explicit but allow the student to continue to explore his or her experiences. At midpoint, students tend to have concrete views of the experiences and analyze the experiences in a mechanical way without social, cultural or ethical considerations. Towards the end of the semester and the completion of the technological presentations,

students begin to demonstrate reflective discussion because they have direct experiences to draw upon. Only towards the later third of the course, do students begin to link course concepts with direct human experience and understand that they were not only learning new concepts in the course, they were actually living the course. Students respond positively to the entire experience.

Will innovation be sustained within the course? Yes

Will you implement this innovation in other courses? Yes

Describe

In OT 360 –Clinical Teaching Skills, students are not yet prepared for a full clinical experience but the course instructors have begun to explore methods for immersing students in “real” clinical situations. In this course, students will be required to create teaching/educational tools for clinical settings based on actual clinical needs. Advisement by experienced clinicians is needed but no direct client contact is required.

Title of innovation: Student Developed Portfolios and Grading by Contract

Name of innovator: Z. Annette Iglarsh PT, Ph.D., MBA

Telephone number 215-596-8693 **email address** a.iglars@usip.edu

Department: Physical Therapy **Type of students:** Fifth year MPT Students

Course where implemented: PT 667 Political and Social Management

Describe goals of innovative educational activity

- Guide the students to develop a product that would assist them when seeking employment upon graduation
- Provide opportunities for the students to create activities that would enhance their resumes
- Provide opportunities and guide the students in preparation of professional level presentations

- Encourage the students to select topics of interest in PT for further study
- Provide the experience to participate in the administration a health fair and present a poster at a health fair
- Establish their own grades goals and thus internalize their motivation to achieve these goals

Describe the innovation and its implementation

Students were given a list of twelve possible categories of projects to complete for inclusion in a student portfolio. Student could choose to present their projects to the class for feedback on both the presentation style and the project. Students also worked together to implement a Health Fair for the university and were able to exhibit a poster presentation on a topic of interest at this event.

These projects complemented the lecture material presented in class by the course instructor. Student wishing to perfect their classroom and in-service presentations were given the opportunity to present in class or to present to clinicians and members of the community.

Student grades were based on a level of activity pre-set and agreed upon by the student and the course instructor. The classroom presentations and the poster presentations at the health fair were peer reviewed but not graded (only deemed as acceptable or unacceptable.) A final portfolio review was conducted in small groups with the course professor at the end of the semester.

Reflect on what's working and why it is working

The projects submitted were of high quality and represented significant knowledge acquisition and application of creativity. The grading by contract feature of the course was effective, in most cases students pushed themselves to a higher level of productivity than if I had awarded them grades. Students who may not have distinguished themselves in the program previously showed a new level of engagement in the learning process in this course because of the self-determination feature. The students did complete the course with a portfolio that distinguished them in the job market. It gave them a high level on confidence that they may not have experienced if they entered an interview with only a resume in hand like all of the other candidates. Many students also

reported being able to present a stronger in-service while on their final affiliations and with less anxiety than they had experienced in previous affiliations.

Describe student reaction to the innovation

At first both the projects and the ability to determine their own grades overwhelmed the students. Many saw both these features to be beyond their ability. Students sought relief from their advisors and I spend an excessive amount of time calming the students and guiding their project selection and development. Some students could not visualize the potential benefit of having a portfolio when seeking employment.

Once the students settled into the projects and their self-selected activities they had to be contained. Many sought to over do the quantity while ignoring the quality of the projects. With guidance they were able to balance the two and proceed with a greater degree of confidence and pride in their work.

Will innovation be sustained within the course? Yes

However, based on student suggestion, I will offer the course in two parts. The first part will be dedicated to presentation of course material and project selection and will be conducted in the fall semester. While work on the project should continue through the semester, the students will not present their projects and portfolio until the next semester, giving the student the intersemester to concentration on project completion. I also plan to spend time with the students in small groups to discuss the projects to a greater degree than I did during the 1999 offering of the course and more efficiently advise the students about the process and the projects. Since the new fifth year students in 2000 observed what the fifth year students experienced in 1999, this new class should be better prepared for the challenge of grade by contract and portfolio development.

Will you implement this innovation in other courses? Yes

The PT faculty has asked me to begin the portfolio concept and activities earlier in the program, in the first pre-professional year. While I will be altering grading criteria to more appropriately fit the pass fail course format of the PT Orientation Sequence, the early seeds of grading by contract will be implemented in the first year curriculum.

Title of innovation: The "PLAGUE" Simulation

Name of innovator: J. R. Johnson, Ph.D.

Telephone number: 215-596-8521 email address J.johnso@usip.edu

Department: Biological Sciences **Type of students** Sophomores & Juniors

Course or activity where implemented: BS 240

Describe goals of innovative educational activity

- To use the software "Plague" to model the spread of an infectious disease in a population
- To collect real time statistical data regarding the hypothetical spread of a disease
- To use this data for graphical and statistical analysis of the factors and the dynamics of disease dissemination within populations.
- To gain experience in a team approach to experimental investigations and in the development and preparation of reports of scientific investigations.

Describe the innovation and its implementation:

Computers provide us with the possibility of investigating the dynamic interaction(s) between a disease agent and its potential hosts. This laboratory exercise is designed to allow student teams of four to five to use a simplified computer program, "Plague", to investigate the described interactions between a disease agent and a host population and to evaluate the outcome these interactions with regard to the population's ability to maintain itself. Before beginning a scenario, students must use the interactive options menu to establish the parameters, which will govern their simulation. The data students obtain is similar to the data obtained by epidemiologists studying the actual spread of infectious diseases in human populations.

The group participation and report write-up following guidelines and rules apply to how teams must operate for this laboratory exercise:

- The team report must clearly describe the scenario tested and the conditions chosen for the investigation. The team report must include sufficient

analytic and graphic treatment of the data to support their conclusions regarding the outcome of the scenario. The team should use the epidemiologic terminology and concepts described in the glossary in preparing the report, but should not limit their interpretation just to the mentioned concepts.

Reflect on what's working and why it is working:

The following components seem to be working well:

- Development of the team approach to problem solving.
- Development and testing of valid hypotheses.
- Manipulation of the software and raw data collection.

The successful development and testing of a hypothesis requires the use of organization skills and trial and error testing. Most students are reasonably familiar with these principles and can intuitively explore parameters by trial and error. Data collection is facilitated by providing the students templates of raw data tables.

The following components are not working as well:

- Data collation and interpretation.
- Concise presentation of data.
- Graphical analysis of data.

Data analysis requires the use of spread sheets, statistics, and graphical analysis of results. The computer and math skills of groups are often taxed, and not all groups develop effective methods for analyzing their raw data.

Describe student reaction to the innovation:

Initially the students are curious about how the software will work and view the exercise as a game, which they can play. As they develop their hypotheses and begin scenario testing, they become frustrated because many of their initial parameters result in either eradication of the disease agent or the population. This introduces them to the dynamic interplay between host and parasite, which will allow both species to survive. Next they begin to collect data and are introduced to the contribution of chance versus probability in outcomes. Finally they must collate and interpret their data. Some teams do much better interpretations than others. Also some team dynamics work well while others are strained. Students learn quickly how the individual has to conform to the group's needs in order to generate a product that all individuals are comfortable signing. Most students have a sense of accomplishment when their reports are complete.

Will innovation be sustained within the course? Yes

Will you implement this innovation in other courses? No

Other comments

We plan to use ERes and web copies of data tables plus example graphs to improve student analysis of results for the fall 2000 semester edition of BS 240 and "Plague".

Title of innovation: Graphing Calculators in Mathematics

Name of innovator: Amy Kimchuk

Telephone number: 215- 596- 8705 **email address:** a.kimchu@usip.edu

Department: Math, Physics, Computer Science, Statistics

Type of students: Freshman

Course or activity where implemented: MA100 – 101 – 102

Describe goals of innovative educational activity

The purpose of the introduction of the graphing calculator in math class is to enhance the understanding of mathematical concepts and to familiarize students with technology.

Describe the innovation and its implementation

Students are required to do all the math by hand first, and then I enhanced their understanding of the concepts by using the calculator. The calculator has allowed me to teach other concepts, such as modeling “real world” data, correlation, programming, and discussing graphs, charts, and tables in more depth. With the graphing calculator, students were able to graph functions I would never require done by hand. It was used as a tool, and did not detract from mathematics.

Reflect on what’s working and why it is working

What works with the graphing calculator is that students now can visualize the mathematics. Without the calculator, the math is a series of steps on how to solve. With the calculator, I was able to show more about the “why” of mathematics.

Describe student reaction to the innovation

Overall, students felt the calculator was a good tool. They believe that it is important to do math both by hand and with the calculator. I have had a lot of positive reinforcement from my students. They also liked programming the calculator, and being able to quickly check their answers.

Will innovation be sustained within the course? Yes

Will you implement this innovation in other courses? Yes

All incoming freshman are now required to have a graphing calculator. I will also use it as a learning tool in any future math/stat class I may teach.

Title of innovation: Mathematics Research Paper

Name of innovator: Amy Kimchuk

Telephone number: 215- 596-8705 **email address:** a.kimchu@usip.edu

Department: Math, Physics, Computer Science, Statistics

Type of students: Freshman

Course or activity where implemented: MA101

Describe goals of innovative educational activity

The purpose of this paper is for students to answer the question as to why mathematics is important in their particular field. The paper is designed for freshman to examine their major closely and to find out how important mathematics is to their major. I also implement the paper to get students interested in learning mathematics, by researching mathematical concepts they will see in the future.

Describe the innovation and its implementation

A 5 page paper is assigned in the beginning of the second semester. This paper is to include an abstract and a bibliography. Students must look for applicable examples of mathematics in their chosen fields, and must show the examples in mathematical symbols. They must also explain the importance of the concept as it relates to their major.

Reflect on what's working and why it is working

This paper is working because it makes freshman examine their major and look at future classes they are expected to take. They also conduct interviews with teachers, pharmacists, peers and people they work with to get information not only on mathematics, but also on their chosen career. They get a chance to look at all aspects of their field of study, and learn more about it.

Describe student reaction to the innovation

Student reaction is a positive one. Most students groan when they first hear about a paper assigned in a math class. But after they start the research, and complete the paper, they realize that there is more to mathematics than just a subject they are required to take in college. They also no longer ask "Why do I have to take Math".

Will innovation be sustained within the course? Yes

Will you implement this innovation in other courses? Yes

Describe

Since we are redesigning the MA 100, 101, 102 course, I will implement the paper in MA102, since that will be the second semester.

Title of Innovation: Interteach

Name of Innovator: J.V. Lambert

Telephone number: 215- 596-8588 **email address:** j. lamber@usip.edu

Department: Social Sciences **Types of students:** Undergraduates

Courses where implemented: PS 101, PS 210, PS 327, SS 220

Describe goals of innovative educational activity:

Interteach is based on the following notions:

1. One of the best ways to learn something is to teach it.
2. What you know is what you can do
3. Learning is “doing”
4. What you learn in a college course, is what you can do afterward, that you could not do before
5. All students can do as the best students do:
 - They study regularly, not just before exams
 - They study actively, organizing, comparing, and contrasting
 - They participate actively in class

The goal in my courses is to get students to speak sensibly about basic facts and concepts.

Describe the innovation and its implementation:

An “interteach” is like an interview, a conversation between two or more people. The conversation is about questions, concepts, and issues from a particular portion of a textbook.

Students are given a “Study and Interteach Guide” at the start of the semester. The material comes from assigned chapters. I make up the questions. These questions are on important topics in the chapters. I tell them to try to find answers to these questions as they are reading the material and to formulate

their answers in writing. They are then encouraged to know these answers well enough to teach them without notes.

On an Interteach day— there are about six of them during the semester— they break into groups of two or three and everyone takes turns teaching the others. I tell them to use their notes, only as “prompts”. I tell them to define every word they use in their teaching. This goes on for about 30 min. At that point, I have them clear their desks and I give a “probe,” a quiz, based on one of the questions, or a combination of one or two questions, or definitions.

They are graded on a 10-point scale. Ten percent of their final grade is based on materials just taught during interteach. Students also get bonus points if they and the other person(s) in their group score “B” or better. Thus, there is an incentive for effective interteaching— for self and others. Twenty percent of their final grade is based on probe performance. Ten percent on simply participating in the interteach activities. So, a total of 30% of the final grade comes from interteaching.

As a member of the Arts and Sciences Advisory Committee, I learned from leaders in businesses and industries that two of the most important skills sought by employers are communication and ability to work in a team. Besides giving my students opportunities to acquire these skills, interteach also serves to help them learn course-specific materials.

Reflect on what’s working and why it is working:

Students like the idea that their quizzes will be limited to a circumscribed portion of reading materials. Their complaints (as reflected in course evaluations) are limited to the fact that they have to keep up with the readings. However, they recognize that in the long-term this technique actually reduced study time. “Grade inflation” was evident when I began using the technique but they know the material.

Will innovation be sustained within the courses? Yes

I will continue to use this technique because it has been so well received. I also, however, lecture, give demonstrations, and, show appropriate videos. My advice is try new strategies that involve student interaction. They seem to enjoy these activities.

Will you implement this innovation in other courses? Yes

Title of innovation: "Web-based Information and Testing for Eudora Light™
Electronic Mail and Campus Computing Policy"

Name of innovator Jeanette McVeigh

Telephone number 215-895-1197 **email address** j.mcveig@usip.edu

Department Information Science.

Type of students Transfer and students returning after withdrawal.

Course or activity where implemented This activity is implemented outside of the Introduction to Computer Applications courses.

Describe goals of innovative educational activity

The Information Science faculty taught single session classes about the campus network, the basics of Eudora Light and the Campus Policy for Responsible Computing to students, who tested out of or were not required to take the Introduction to Computer Applications course. These students already had a full class schedule and frequently worked. Arranging these single session classes to fit all students' schedules was impossible.

Since I coordinated these classes, my goal was to provide the informational content to the students in a way that allowed more flexibility for the students and also assured that the content was read and understood.

Describe the innovation and its implementation

I turned to the Web and its 24 x 7 availability as a means to solve the scheduling problem. I created in HTML format a FAQ covering the basics of the campus computer network and basic features of Eudora Light. I also converted to HTML format the sections of the Campus Policy on Responsible Computing, which the students were required to read in the one hour sessions. Both of these were uploaded to the University's web page. To test the students on the content, I created an online test using CyberExam online testing application.

After preliminary testing in August 1999, the reading material and test were ready for student use on September 13, 1999. To date, about 80 students have taken the test based on the online readings.

Reflect on what's working and why it is working

When this material was taught in the classroom setting the Instructor had to cover the campus network, Eudora Light basics and allow 5 minutes for the students to read the "Responsible Computing Policy." While the Instructor did ask questions, time constraints prohibited querying all students. Using web-based readings and testing, which requires the students to read the material to pass, there is somewhat more assurance that every student has read the information.

Students can take the exam and number of times to pass. CyberExam has a feature that allows randomization of test sections, test questions and test answers, so that the test appears to be different each time. Cyberexam immediately reports his or her score to the student.

Describe student reaction to the innovation

Student reaction is very positive. They like the flexibility. They have full class schedules and many of them work, so fitting in an additional class session was very difficult. Although they still must sign a form requesting that their e-mail accounts be activated, the students can read the material and take the test from any location, at any time.

Will innovation be sustained within the course? Yes

Other comments

Based upon the data from the report from Cyberexam, I am currently revising the reading material and questions for the Fall semester.

Title of innovation Problem-Based Learning Activities in a Kinesiology Course

Name of innovator Peter Miller

Telephone number 215-596-8542 **email address** p.miller@usip.edu

Department Physical Therapy **Type of students** 3rd year MPT

Course or activity where implemented PT 571 - Kinesiology

Describe goals of innovative educational activity

1. Provision of opportunities for self-directed learning
2. Development of professional behaviors: collaboration, communication, goal-directed group work
3. Development of higher levels of learning for students

Describe the innovation and its implementation

Several critical areas of learning in the Kinesiology course were not taught by lecture method but instead were embedded within patient case problems, which were given to students to work on in groups (randomly assigned) over the course of a semester (5-6 cases per semester). Students were responsible for writing case reports that demonstrated understanding of the new areas of learning and presenting them in class.

Reflect on what's working and why it is working

Students have largely demonstrated the ability to learn critical course content independently in groups and demonstrate that knowledge in written and verbal form, as well as on course exams. In addition, some students have demonstrated the desire and ability to learn the material at a higher level (at the analytical and synthetic cognitive objective level) than could be expected if the entire course was teacher-driven. I believe that the most important finding is that many students will learn at a higher level if the opportunities for such learning are provided. Extrinsically motivated students (who learn to earn a grade) will do what is necessary to complete an assignment; intrinsically motivated students (who learn for the sake of learning) will get much more out of the assignment.

Describe student reaction to the innovation

In surveys taken over the three years this innovation has been implemented students have expressed the opinion that working in randomly assigned groups several times a semester does facilitate their ability to work collaboratively and develop professional behaviors. Many of them also express self-satisfaction and pride with their level of learning. They also express the opinion that the workload for these case problems is high, and that it is difficult for them to carry out the obligations of a course that requires so much independent work within the context of a curriculum that is more traditionally designed.

Will innovation be sustained within the course? Yes

Will you implement this innovation in other courses? Yes

This course design has been used as a model for a course (Clinical Simulations) that is entirely based on case problems and small group work. This course serves as the capstone for the curriculum.

Title of innovation: Surfing the Zoology Internet

Name of Innovator: Alison M. Mostrom

Telephone number: 215- 895-1137 **e-mail address:** a.mostro@usip.edu

Department: Biological Sciences

Type of students: Sophomore - Junior Biology Majors, some of whom will become middle and high school teachers.

Course or activity where implemented: BS200: Animal Diversity and Morphology.

Describe the innovation and its implementation:

I chose 10 web and asked students to assess each site. In order to do this I generated two sets of questions for each web site: (1) general questions about the home page and the purpose of the site; and (2) specific questions about details of the site or information offered therein. Therefore, through a reiterative process students learned not only how to generally assess a site, but they also learned an immense amount about each site because they had to delve into it to answer specific questions I asked. I selected a variety of types of sites. Ideally, students were to complete one web site assessment a week for 10 weeks.

Describe the goals of the innovative educational activity:

The goal of this project was to have students evaluate 10 internet sites over the course of the semester. The sites were on topics that we were discussing in class, but lead to data and information that was not presented in class, lab, or in the textbook. The individual objectives that supported the main goal of having students evaluate web sites were:

- (1) To use the world-wide web for educational purposes;
- (2) To improve "evaluation skills";
- (3) To compare and contrast some sites that presented material on the same topic; and

(4) To effectively communicate information via a written assessment of each site.

Reflect on what's working and why it is working:

The best thing about this assignment was that students had the opportunity to "learn outside of the classroom", and have fun while doing so. The knowledge learned and skilled gained by completing this exercise could be especially useful for those students who plan on becoming teachers. I also liked the idea that this was a project intended to have students visit the educational web throughout the semester, as we were discussing the relevant taxa or topics in class.

Describe student reaction to the innovation:

Students commented that they enjoyed learning from a "non-traditional source", and under a "low pressure" environment.

Will the innovation be sustained within the course?

I will continue to assign this project, but I will modify it somewhat next year. I will assign each of the 10 web assessments as we are discussing the taxa or topic so that I am sure students are completing them in a timely manner. I will also allow some class discussion of each assignment, so students can share their opinions with each other.

Will you implement this innovation in other courses?

As I find valuable web sites that are relevant to topics covered in other courses I may have students assess these in some manner.

Other comments

There are numerous assignments that can be directed at having students assess web sites. This one made students search the details of sites I selected as being of high quality. In order to have them look into sites deeply; I had to generate very specific questions about the sites. My work was accomplished prior to the assignment (selecting sites, determining questions, and devising a basic answer guide). Another way to have students visit web sites is to allow for a more general and flexible set of questions, or ask them to develop questions (and an answer key) about the site, and have students select their own sites. The professor's work is then to visit each site chosen by the students and to verify the information provided by the students.

Title of innovation: Use of computer-based testing in the Pharmacy Systems Management Course

Name of innovator: Andrew M. Peterson, PharmD, BCPS

Telephone number: 215-596-8754 **email address:** a.peters@usip.edu

Department: Pharmacy Practice/Pharmacy Administration

Type of students: 4th year pharmacy students (second professional year)
Pharmacy Systems Management – PA444

Describe goals of innovative educational activity

The Pharmacy licensing examination is currently fully computerized and all graduates seeking licensure are required to take this exam. Currently, our students are minimally exposed to computer-based examinations and preliminary findings in a small group of students showed students are very apprehensive about taking an exam via computer. Therefore, the goal of this

activity was to familiarize the student with computer-based testing through administering at least one exam in a course via this format.

Describe the innovation and its implementation

Fifty-three students participated in a pilot project examining issues surrounding students' willingness to take an exam via computer. Through this pilot study, significant differences were found in exam scores between students taking the exam via computer versus the traditional paper and pencil method. In addition, significant differences in computer-anxiety were also discovered. The literature suggests that gender, GPA, locus of control and age may also factor into computer-exam performance. Therefore, a qualitative study of 126 students examined the contribution of these factors as potential reasons for score differences. The results of this study found only computer anxiety remained a factor in exam performance for 4th year pharmacy students.

The last aspect of this study entailed the random assignment of 109 students to take one of two exams via computer. In a crossover study, all students took two multiple-choice examinations via computer and paper and pencil. Repeated measures analysis of variance was used to determine if differences existed between exam scores for each format.

The results showed no difference in exam score by exam format. That is, students did equally as well taking an exam on computer as they did paper and pencil. There was no difference in scores between exams as well.

The results show that anxiety exists among students for taking an exam via computer. The fear is primarily related to computer-anxiety and not literature reported factors such as age, gender, GPA or locus of control. However, no differences exist in exam scores based on exam format for 4th year pharmacy management students. Therefore, while the fear of computer-based exam may exist, the students can be assured that it will not affect their exam performance.

Describe student reaction to the innovation

In an informal exit survey, nearly all students liked taking the exam via computer, primarily because they were able to receive immediate feedback on their performance. The computer software instantly calculates the grade for the exam and reports it to the student. Further, the software also indicates which questions the students correctly and incorrectly answered, furthering the feedback with respect to the learning from the exam.

Will innovation be sustained within the course? Yes

The innovation will be continued in subsequent years, with the intention of moving all examinations for this course to computer-based testing.

Title of Innovation: Assignment using Excel and individualized data in regression analysis Project 1: Correlation and Regression

Name of Innovator: Barbara Bendl Reilly

Telephone number: 215-895-1120 **email address:** b.reilly@usip.edu

Department: Mathematics, Physics, Computer Science, & Statistics

Type of students: 3rd year students

Course or activity where implemented: ST310: Biostatistics

Describe goals of innovative educational activity

1. to promote the use of computers and Excel in statistical evaluation
2. to reinforce concepts that are dealt with only briefly in class
3. to promote critical analysis of data and statistical results
4. to promote clear scientific writing
5. to provide a non-test activity that is included in the course grade

Describe the innovation and its implementation

Students are given a large data set in Excel format, which includes several different variables. They are given individualized instructions (based on their student ID number, with modifications, if necessary, to avoid duplicates) for selecting a smaller sample of data to analyze. They are also given detailed questions to answer that involve some freedom of choice of variable, the use of descriptive statistics, presentation of information in chart or graph form, correlations, and regression analysis. Once they have answered the questions for themselves, they are required to organize their answers into a well written report, with critical analysis of their results and some general conclusions about the statistical procedures that they employed. This report is handed in, along with all relevant charts and graphs. I am available to them as a computer and statistical consultant to guide them along the way and help them over minor glitches.

Reflect on what's working and why it is working

Forcing them to actually work with their own sample creates an opportunity for them to delve into and understand some statistical procedures that we don't spend a lot of time talking about in class. It also brings home the point that sometimes you don't get very "good" results with real data but that you have to report what you find anyway. The fact that all the samples are individualized means that they can consult among themselves in general about the concepts but they must do their own work in the end and write the report of their unique findings. Also, making this an Excel assignment gives them an opportunity to revisit a program that they exhibited a proficiency in as part of the core curriculum.

Describe student reaction to the innovation

Overall, students like having something besides tests included in their course grade. Also, the individualized nature of this project makes it more of a cooperative learning experience – students seem more inclined to help each other when, in the end, everyone must do the same amount of work and no one gets a "free ride".

Will the innovation be sustained within the course? Yes

Will you implement this innovation in other courses? Yes

Having all students doing the same assignment with individualized data allows students the chance to demonstrate an understanding of the underlying concepts. I use this same technique in parts of MA101 and MA102 math labs. I avoid the grading nightmare by insisting on the inclusion of relevant graphs so that I can easily check the results visually and then critique their report of those results. If something doesn't seem quite right I can also quickly reproduce the numerical calculations using the computer.

Title of Innovation: Combined Journal Research, Knowledge of Probability Concepts, and Test Question Construction.

Name of Innovator: Barbara Bendl Reilly

Telephone number: 215-895-1120 **email address:** b.reilly@usip.edu

Department: Math/Physics/Computer Science **Type of students:** 3rd year

Course or activity where implemented: ST310: Biostatistics

Describe goals of innovative educational activity

1. to highlight the connection between probability theory and research in the client disciplines
2. to remind students of the difference between memorizing a probability definition or calculation rule and demonstrating understanding by applying it correctly
3. to remind students that data can be presented in various forms –charts, tables, paragraphs, etc. –and that these may be interchangeable
4. to encourage students to be critical readers of research articles
5. to highlight the difficulty of writing good test questions

Describe the innovation and its implementation

The assignment is for students to find an article that involves health-related research and that gives data that can be put into table form and used to pose probability questions. They must hand in a brief description of the research to introduce the data, the data itself in table form, 5 probability questions and answers based on the table, a copy of the source article, and the bibliographic reference. Students are familiar with the format because I use a similar format for class examples and test items. As an extra incentive, students are told that in addition to the project grade, some questions from these projects will be used on the final exam that semester.

Reflect on what's working and why it is working

This project forces students to read research articles with a different perspective. They have to really concentrate on the specific numerical information that is given. Is it complete? Is it understandable? Can it be put into a table where the rows and columns add up properly? This gives them another way to really evaluate the reported research. It reminds them that there is a lot of shoddy statistical analysis out there (or, at least, shoddy reporting of statistical analysis) and gives them some additional points to check when they are reporting on their own research and statistical results. This whole procedure seems to draw them into the research rather than allowing them to remain at a distance as a superficial reader. For the most part this is not an especially time-consuming project – students will generally only have to read a few articles to find one that they can use – and yet completing it successfully also demonstrates a real understanding of the underlying probability concepts.

Describe student reaction to the innovation

Students seem to like this project. Again, it is not especially time consuming. Successful completion of the project is a way to enhance their course grade. The lure of possibly having their own question on the final exam, which presumably would give them an advantage, is also a plus for this project in the students' eyes.

Will the innovation be sustained within the course? Yes

Will you implement this innovation in other courses? No

At this time, I don't really teach any other courses where this particular innovation would be as appropriate as it is here but, for Biostatistics, I am building up a nice inventory of real world class examples and test items.

Title of Innovation: Group mathematics laboratory assignment with multiple “correct” solutions

Name of Innovator: Barbara Bendl Reilly

Telephone number: 215-895-1120 **email address:** b.reilly@usip.edu

Department: Mathematics, Physics, Computer Science, & Statistics

Type of students: 2nd semester freshman

Course or activity where implemented: MA102: Mathematical Analysis II

Describe goals of innovative educational activity

1. to highlight the use of calculus in a non-routine application
2. to promote critical thinking
3. to encourage creative thinking
4. to promote cooperative learning
5. to foster more positive attitudes towards mathematics
6. to promote mathematical writing
7. to highlight the number-crunching utility of a computer algebra system

Students in MA102 generally complete four or five mathematics laboratory assignments during the semester. For the most part, these assignments focus on the individual student using proper calculus techniques and a computer algebra system to arrive at the correct solutions to the given problems. The Farmer Yost Math Lab is different in a number of aspects. It is a group lab project – students are required to work in teams of 4 or 5. The problem itself is open-ended in that Farmer Yost’s dilemma is described and certain parameters are given, but within those parameters, there are still at least 7 different approaches that could ultimately lead to a “solution” to Farmer Yost’s dilemma. The student groups have to decide on an approach, carry it out correctly, analyze the whole thing to make sure that they really have solved the dilemma within the parameters, and then write a comprehensive and clear report of what the group has done and what they conclude. Although some approaches may be more obvious than others may, students are encouraged to think creatively,

always using correct mathematical procedures, and rewarded for such creative thinking in the lab grade. The clarity and understandability of the group's report is also weighted more heavily than merely getting a correct mathematical answer – creativity and good writing are rewarded here as well.

Reflect on what's working and why it is working

Since it is a group project and the prospect of multiple "correct" solutions is stressed when the assignment is given to the students, their interest is piqued immediately and they are also made immediately aware of the fact that this lab cannot reasonably be completed at the last minute. Therefore, groups are formed quickly and discussion begins and continues throughout the week – students are forced to actually talk about problem solving, mathematics, and calculus, rather than just filling numbers into some template. The stress on creativity, explanation, and good writing also tends to integrate mathematics better into the rest of their academic experience.

Describe student reaction to the innovation

Although students generally dislike the math labs, this particular lab is better received than most of them. Once they start to actually work on the problem, they tend to debate different approaches to the solution and the presentation (report) of the solution, both within their own group and with other groups. They are investing much more time and thought in this lab than in any of the others and complaining less about it.

Will the innovation be sustained within the course? Yes

Will you implement this innovation in other courses? Yes

Four aspects of this innovation can be used in other courses: students working in groups, the use of an open-ended problem without a single "correct"

solution, the use of technology as a support to the thinking process, and the stress on clear scientific report writing.

Title of Innovation: Peer Evaluation of Research Presentations
Name of Innovator: Barbara Bendl Reilly
Telephone number: 215-895-1120 **email address** b.reilly@usip.edu
Department: Mathematics, Physics, Computer Science, & Statistics
Type of students: 2nd year students

Course or activity where implemented: IH201-202: Infinity in the Development of Science

Describe goals of innovative educational activity

1. to increase attention during student presentations
2. to promote critical review of presentations
3. to provide peer feedback on presentations to assist in student self-evaluation
4. to foster a sense of camaraderie and mutual cooperation among the students in the class

Describe the innovation and its implementation

Students, individually or in groups of 2 to 4, research a topic relative in some way to infinity and then write a research summary term paper. The student or group also makes a 10 to 15 minute presentation of their topic to the class. These student presentations run the gamut from informal conversational lectures to video or PowerPoint presentations. For each of these presentations, the students in the audience fill out an anonymous peer evaluation form that is divided into 4 major categories: content, organization, use of visual aids, and delivery. The peer evaluators are instructed to give the presenters a numerical ranking, choosing from 1 (excellent), 2 (good), 3 (satisfactory), and 4 (unsatisfactory) and also to include written comments in each category. After the class, I tabulate the numerical rankings and give the presenter(s) an overall peer evaluation score. I also read the written comments. I use the peer evaluation score as a reference in my assignment of the presentation grade but

I reserve the right to overrule. Generally, the peer evaluations and my evaluation are relatively similar – neither seems to be unduly swayed by glitz over substance. At the next class meeting, I hand the presenter(s) a packet of the peer evaluations and my tabulation sheet so they get fairly quick feedback.

Reflect on what's working and why it is working

Use of this peer evaluation system focuses everyone's attention on what constitutes a good presentation. Since the evaluators will also be the evaluated at another time, there seems to be a concerted effort towards fairness and understanding as well as critical review. Student evaluators are forgiving of technical glitches but not of presenters who have obviously not practiced their presentation. They do not hesitate to point out flaws in a presentation but they generally do so in a constructive way, with suggestions for how to handle the problem in future presentations. They also seem determined to find some aspect to praise, even in the uncommon event of a truly awful presentation.

Describe student reaction to the innovation

Students like this procedure. It helps keep them alert during presentations, which is sometimes hard as this class meets at 8:30 in the morning. It gives them a chance to express their opinion. They have expressed feelings of empowerment because they know that I will give their opinion serious consideration. Getting the packet of peer evaluations back at the next class gives the presenters detailed responses to the "how did it go?" question and makes my assignment of presentation grade seem less arbitrary and more of a group consensus.

Will the innovation be sustained within the course? Yes

Will you implement this innovation in other courses? Yes

I use this peer evaluation method whenever I include student presentations as part of a course, such as in MA350, Chaos and Complexity.

Title of Innovation: Textbook to Address the Particular Algebra and Function Review Needed by USIP students

Name of Innovator: Barbara Bendl Reilly and Carole Ann Siegel

Telephone number: 215-895-1120 and 215-596-8547

email address: b.reilly@usip.edu and c.siegel@usip.edu

Department: Mathematics, Physics, Computer Science, & Statistics

Type of students: 1st semester freshmen

Course or activity where implemented: MA101: Mathematical Analysis I

Describe goals of innovative educational activity

1. to give students an algebra and functions textbook that was readable

2. to highlight those algebra and function concepts and skills necessary for student success in calculus at USIP
3. to provide students with practice problems in the needed algebra and function concepts and skills

Describe the innovation and its implementation

Students entering USIP, even the better students and students who have already taken high school calculus, need some review of algebra and functions. When MA101 and MA102 became the core curriculum mathematics sequence this review was incorporated into the first two-thirds of the MA101 course. However, the lack of a good and readable textbook that addressed the topics that USIP students especially needed to review was a problem. So we wrote our own textbook, *Algebra and Functions for Mathematical Analysis*, incorporating topics in a way that we felt was both accessible to our particular student population and relevant both to a successful completion of the math core curriculum sequence and to the major programs of study at USIP. Our textbook was adopted along with a separate calculus textbook for all students enrolled in MA101. All MA101 instructors use *Algebra and Functions for Mathematical Analysis*, referring to the topics and examples and assigning exercises from it. The present form is the 7th edition and it has undergone major expansion twice.

Reflect on what's working and why it is working

Concentration of information on fewer, selected topics makes the textbook less intimidating to students and prepares them more precisely for what's to come in calculus. Topics that are interesting mathematically but not immediately useful have been pared down or eliminated completely. Students spend the bulk of their time practicing skills that they will be called upon to use within the next year so there is less time for forgetting and students can see the relevance of what they are learning and practicing within a relatively short time span.

Describe student reaction to the innovation

Generally student reaction has been very positive. They like the readability of the text and the number of practice problems. They seem pleased that we have put in the time and effort to tailor a textbook just for them – this seems to motivate them to an increased effort on their part.

Will the innovation be sustained within the course? Yes

Will you implement this innovation in other courses? No

We are currently revising our textbook yet again. This time we have another co-author, Amy Kimchuk, who is adding instruction for using TI-83 calculators to explore the book's topics and some exercises specifically for student practice with the TI-83. *Algebra and Functions for Mathematical Analysis* was written for a specific course. However, the idea, "if you don't like the available textbooks, write your own", is certainly transferable to other courses.

Title of innovation Using the Past to Analyze Present Practice Dilemmas
Name of innovator Ruth L. Schemm
Telephone number 215- 596- 8890 **email address** r.schemm@usip.edu
Department Occupational Therapy **Type of students** 4th Year
Course or activity where implemented OT 570

Describe goals of innovative educational activity

1. Trace present day practice issues to past events by use of documents, artifacts, photographs and scholarly articles that are over 50 years old.
2. Teach students to analyze and integrate ideas
3. Reinforce student abilities to analyze many facets of a problem
4. Promote understanding of how ideas evolve over time
5. Use the past to understand present day events

Describe the innovation and its implementation

Students identify a present-day clinical issue that interests them. They are required to trace this issue back into the early days of clinical practice. Primary sources are required. Students produce a scholarly paper that is based on an analysis of facts taken from past and present literature.

Reflect on what's working and why it is working

Students learn to analyze information, organize ideas and present them in a scholarly paper. Many get excited about the past. This increases their respect for early practitioners. I think the excitement stems from the realization that early practitioners faced some of the same challenges that they face today.

Many students learn how to create a cohesive paper that builds on the work of other authors.

The historical collection of artifacts, slides, and journals makes access to early materials easier and this is often mentioned in course evaluations and feedback sessions.

Describe student reaction to the innovation

By the end of the semester, the majority of students appreciate the assignment. They respect the rigor and understand how the assignment improves their communication skills. A few students are delighted with the assignment and begin to work on it right away. Some students moan about the assignment at first but gain interest as they identify with past practitioners or patients. Some students flourish with one-to-one attention on their topic. They use advising time to refine their ideas. A few students worked with faculty in the Writing Center to refine their writing skills. There is a marked improvement in the analytic and written skills of all members of the class.

Will innovation be sustained within the course? Yes

Will you implement this innovation in other courses? No

This will be the only course that I will be teaching at the present time.

Other comments

It is touching to see the students energized and focused on their projects.

Title of Innovation: Competency-Based Student Assessment

Name of Innovator: Karen J. Tietze

Telephone number: 215 596-8854

E-mail address: k.tietze@usip.edu

Department: Department of Pharmacy Practice and Pharmacy Administration

Type of Students: First professional year Doctor of Pharmacy students

Course or activity where implemented: PP305 Introduction to Clinical Pharmacy Skills

Describe goals of innovative educational activity:

To ensure that all students in the course demonstrate a minimal level of clinically relevant competency in selected clinical pharmacy skills before progressing out of the course.

Describe the innovation and its implementation:

In the past student grades in this course were based on the percent of points earned on written and practical exams. But this approach does not reflect clinically relevant competencies. For example, a student who demonstrates 75% of the correct steps for obtaining a patient's blood pressure would have a passing grade by usual grading standards. However, in a clinical setting missing even one step of the technique could invalidate the blood pressure reading. I developed two competency-based assessments in the course to ensure a minimum level of clinical competency in all students who pass the course.

Students demonstrate minimal clinical competency in select physical assessment skills and in obtaining and documenting a patient medication history. Each competency is worth a maximum of five points for a total of 10 points (10 percent of the overall grade). Minimal clinical competency is defined by step-by-step physical assessment checklists and medication history content, style and format checklists. The checklists initially are presented during lecture then are used as the basis for practicing the skills during recitation.

The students practice the physical assessment skills during four one-hour recitations and optional supervised practice sessions. The students are tested on one of six randomly selected skill-sets during a scheduled practical exam. Students who correctly demonstrate all steps of the skill set earn 5 points; students who do not demonstrate competency the first attempt are given an individualized review session and then retested. The test, review and retest cycle continues until the student demonstrates minimal competency. The number of retests is not limited but students lose 2 points for each retest.

Students obtain and document a practice medication history during recitation. The history is assessed using the medication history checklist but is not graded. The student then interviews a patient and submits a written medication history document. Students who demonstrate competency earn 5 points. Students who do not demonstrate competency receive written feedback on their errors. The student corrects the errors and resubmits the medication history. The assessment, feedback, and resubmission cycle continues until the student demonstrates competency. Again, the number of resubmissions is not limited but students lose 2 points for each resubmission.

Reflect on what's working and why it is working:

The competency-based skill assessment seems to work. Completion of the course now means that the student has demonstrated minimal competency in select physical assessment skills and medication history skills. Overall, the students seem to take the material more seriously than in the past. Most students approach these recitations much more seriously than when they did not have to personally demonstrate the skills. It's now personal! Having to demonstrate individual competency seems to motivate the students to a higher level of achievement.

Over the past four semesters 97% of students achieved competency on the physical assessment exam the first attempt; no student required more than two attempts. Prior to implementing the competency-based assessment, the average on the practical exam was in the 70's to 80's. Approximately 45% of

students achieve competency with the medication history the first attempt; a few students require two or three attempts.

Describe student reaction to the innovation:

This is the first course in which most pharmacy students encounter the concept of competency-based assessment. The students are quite nervous as they learn the skills, but the nearly universal response after the practical exam is "That wasn't bad. I don't know why I was so nervous."

Will innovation be sustained within the course? Yes.

I plan to develop more competency-based assessments for the course.

Will you implement this innovation in other courses? Yes, when possible.

Title of Innovation: Integrated lecture, literature assessment and patient case application.

Name of Innovator: Karen J. Tietze

Telephone number: 215- 596-8854 **E-mail address:** k.tietze@usip.edu

Department: Department of Pharmacy Practice and Pharmacy Administration

Type of Students: Flexible Doctor of Pharmacy students (adult learners).

Course or activity where implemented: PP610 Pulmonary Disorders and Therapeutics

Describe goals of innovative educational activity:

To integrate lecture, literature assessment and patient case application in the Flexible Doctor of Pharmacy PP610 Pulmonary Disorders and Therapeutics course.

Describe the innovation and its implementation:

The PP610 Pulmonary Disorders and Therapeutics course is scheduled for six three-hour blocks of time plus an exam. This class schedule creates many challenges. For example, I cannot sustain student interest lecturing for three straight hours. The lecture format is too passive and doesn't encourage self-discovery. Flex students also bring some unique challenges to the classroom. Flex students usually work full-time, leaving little time for in-depth exploration of the current literature. In addition, many Flex students want interactive learning environments where they can discuss their own experiences and discover where their observations fit with the standards of practice.

I designed the course so that the three-hour block of time is divided into three discrete 50-minute subunits consisting of a lecture, a group literature review session, and a group patient case recitation. Each subunit requires very different kinds of student activity but all three subunits have to come together in order for the topic to be complete. Students are randomly divided into

groups of four students (students work with the same group for the duration of the course). A typical three-hour block of time starts with the patient cases from the prior week's topic. The students, working as a group, identify and discuss the relevant patient data and develop a consensus recommendation regarding the therapeutics of the specific disease state. The discussion typically bring in information from lecture, the required readings (a current review article plus their assigned study) and their own experiences. The second subunit consists of an introductory lecture on a new disease state and the relevant pharmacotherapeutics. The third subunit consists of group discussion of assigned clinical studies. Studies are assigned so that half the group reads one study and the other half read another study. This allows the students to learn a lot of detail from studies they did not read.

Reflect on what's working and why it is working:

The students seem very engaged in the learning process. Time goes by very fast for the students (and for me). This approach requires a great deal of prep time and a lot of in-class energy but I feel as if I'm directing their learning rather than just lecturing to passive recipients. As in all group learning, the collective strength of the group depends on each member's preparation. Although most groups work well, there always seem to be a few students who are not prepared for the group discussions and contribute little to their peer's learning. But in the end, most students seem to "get it" and do very well on complex patient case-based exams.

Describe student reaction to the innovation:

Most of the student feedback has been positive. Student comments on my Spring 2000 course supplemental evaluations included, "I enjoyed the structure of the class period". The recitation and readings seemed to break up the class in a positive way." "The class was fun. Good pace, especially. I enjoyed the student participation part." "The format was very good. I liked the group interaction, although some students were unprepared for class." "Liked the mix or readings, recitation, and lecture. Liked working in small groups – of

course I had a good group to help." "Doing the cases in class really help put the specific topic into perspective." The students were very positive about the patient case group discussions but a little less positive about the literature review sessions.

Will innovation be sustained within the course? Yes

Will you implement this innovation in other courses?

Yes given the right course and number of students. This format requires multiple sequential hours on the same topic. It also requires a relatively small class (less than 30).

Title of innovation: Guided Journal
Name of innovator: Elena Umland
Telephone number: 215-596-8584 email address:
e.umland@usip.edu
Department: DOPP/PA
Type of students: 5th year Pharm.D. and Flexible Option Pharm.D.
Course or activity where implemented: PP614 – Women’s Health: Common
Therapeutic Topics

Describe goals of innovative educational activity

1. To stimulate thinking about issues, questions, and problems raised by the course; and
2. To respond to these issues and problems and answer the questions using the lay media, reference texts, primary literature, interviews, and individual experience.

Describe the innovation and its implementation

Starting on week 2 of the semester, students were requested to make weekly journal entries (none required the 3 weeks that in class quizzes were given) such that their journal would contain 10 entries by the end of the semester.

Two entries were to be made from each of the following categories:

1. Reflective observation – connecting new materials learned in class to personal experiences and prior knowledge
2. Question of the day – answering a question spawned from the material presented in that day’s lecture; the answer is to be derived from reference texts and/or primary literature
3. Interview – interview someone outside the class relative to a women’s health topic or question that the student develops; assessing the interviewee’s understanding and/or thoughts/feelings relative to the topic

4. Popular media – identify a magazine article/ad, newspaper article/ad, or television program/segment that relates to women’s health; relaying the reactions, thoughts, etc. that result from this information geared towards popular audiences.

The remaining 2 entries could come from these categories or an entry of their own choice/creativity.

Journals were collected periodically to ensure that they were being kept throughout the semester. Average length of entries was not to exceed 1-2 handwritten pages. Students were instructed NOT to spend more than 15 minutes to ½ hour, on average, per entry.

This project was worth 20% of the overall course grade. The 20 points that it was worth was derived from the following scheme:

8 points – content, evidence that the student is thinking, application of concepts

5 points – content requirements (entry categories and weekly entries)

4 points – spelling, grammar, organization, proper referencing where appropriate

3 points – individuality, creativity

Reflect on what’s working and why it is working

This is a project that was very well received as an extension of the course. It is a project that focuses on the process of learning rather than the details of what is learned. This allowed the students to document their thoughts and reactions without judgement.

Describe student reaction to the innovation

Again, this project was very well received by the class. Student evaluations of teaching revealed the following comments:

“Journal entries were an effective method to solidify the class topics and also recognize the importance of women’s health”

“The journal was different and exposed the student to a variety of information sources, including their own reflective thinking”

“Journals were a great idea”

Will innovation be sustained within the course? Yes

Will you implement this innovation in other courses? No

This is an activity/project that very well suits the small class (<30 students). While reading the journal entries is enjoyable, to initiate this in a large class would require a copious amount of time. And to consider requiring fewer entries would not do the project justice.

**Innovations in Teaching and Learning at the University of the Sciences in Philadelphia,
Submission form**

Description of Innovation

Title of innovation_____

Name of innovator_____

Telephone number_____ email address_____

Department_____ Type of students_____

Course or activity where implemented_____

Describe goals of innovative educational activity

Describe the innovation and its implementation

Reflect on what's working and why it is working

Describe student reaction to the innovation

Will innovation be sustained within the course? Yes___ No___