Immunology Outside of the Box

Faculty Learning Community
Project Portfolio

submitted by

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Student Associates

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Course in which the Project was offered:

Course Title: Immunology
Course Description: Sophomore-level, facts-based foundation course. An introduction to the basic concepts of the body's immune responses, with specific applications to infectious diseases, cancer, transplantations, allergic reactions and autoimmunity
Course Homepage (includes syllabus): http://www.rit.edu/~gtfsbi/imm/home1999.htm
Course Offered: Winter Quarter, 2001-2002
Large lecture-only class (86 students)
Auditorium-type classroom (08A-300)
Class Meeting Times: 8-9 AM, M,W,F

Course Learning Objectives

1. Become fully familiar with the fundamental concepts and facts of immunity and immune responses
2. Apply these concepts and facts to an understanding of how the body responds in a protective manner against infectious diseases (viral and bacterial) and cancer, and how this same type of response leads to transplantation rejection, allergic reactions and autoimmune diseases
3. Investigate the relationships of course content to major relevant, current and often controversial health and social issues for which immunology forms an important foundation

Teaching Practices and Process

1. This course is taught mainly in a lecture/discussion format, using discussion outlines, and images and figures from the text to guide the presentation and demonstrate relationships among the facts and concepts being presented.
2. Complete sets of discussion notes, textbook references (including all text figures used), and links to internet reference materials and current news articles that highlight the importance of immunology to major issues are provided in the course homepage.
3. Student in-class questions and comments often guide the focus of the discussion, without jeopardizing the presentation of the necessary foundation materials.

Course Innovations

This course does not use any methods of teaching and learning that are unique or proprietary.

Course Challenges related to Project

1. Course structure provided very limited opportunities to engage students in spontaneous, in-class dialogue
2. Occasional spontaneous discussion of course relevancy to "current events" often took entire class meeting time (even if guided by instructor)
3. Relevant applications of course content has proven to be a very powerful learning tool in prior years (did not want to sacrifice this)

Project Goals (to address Course Challenges above)

1. Cover ALL necessary course content in a structured manner
2. Engage ALL students in critical thinking
3. Continue to highlight the relevancy of course content to major health, social and scientific issues
4. Challenge each student to address a "real-world" problem for which a solid understanding of course material forms the major basis for the student's "solution" to that problem
5. Expand knowledge of immunology beyond course syllabus in areas relevant to the problem being addressed
6. Do not sacrifice significant class time
7. Experience the challenges of working in a group early in the academic career
8. Select the most effective means for presentation of the project

Following attendance at the November, 2001 Lilly Conference on College Teaching, the following project design goals were added

9. Move to out-of-classroom activity
10. Provide opportunities to extend well beyond classroom course content
11. Use group approach

Project Implementation Steps

(more details can be found at http://www.rit.edu/~gtfsbi/imm/grading2001.htm#project)

I. At end of first class meeting (last 15-20 minutes of class)

1. Project concept introduced (including portion of grade)
2. Groups of 4 students randomly formed ("blind" drawing)
3. Group leader selected (leader responsibilities briefly outlined)
4. Project selected from among 10 offered by instructor
(Project descriptions can be found at http://www.rit.edu/~gtfsbi/imm/projects.htm
5. Method(s) of communication among group members established

II. At two-three weeks into the quarter (outside of class)

1. Status of project from each group leader
2. Any further definition of project parameters
3. Any problems encountered with group dynamics
4. Method of project presentation - any special needs?

III. At various times afterwards

1. Project ideas and/or drafts submitted (only at discretion of group leader)
2. Critiqued by instructor (with "preliminary" grade indicated based on work to date)
3. Specific dates/times established for group presentation of project
4. Method of presentation selected

Project Results

Instructor's Perspective

1. Highly variable levels of project breadth and depth
2. Results very often directly related to effectiveness of group leader
3. Relevant course material was appropriately used in project design and presentation
4. Most (but not all) groups included excellent additional supporting materials that were not specifically covered in the course
5. Opinions presented were quite solid and often provocative (if a controversial issue was the project focus)
6. Methods of presentation correlated quite well with project "messages" and or intended audiences
7. Most effective means of presentation of project that also allowed most comprehensive assessment of each student's contributions was interactive group meeting with course instructor
8. A few personality issues arose in some groups (abilities of group leaders to address these issues were varied)

Student Associates Feedback

1. Some projects were not sufficiently challenging (increase depth and breadth)
2. Focus only on science-based topics (do not include projects with social, ethical questions)
3. No group leader needed (students felt a "natural" leader would emerge)
4. Tighten deadlines, shorten time to complete project (end of quarter was deadline)
5. Delineate specific project expectations more clearly
6. Evaluate individual contributions to each group (no formal method was employed, only group leader opinions were solicited - not a good method)
7. More choices for projects

Student Course Evaluation Comments

(students were specifically asked to respond to the Project as part of their evaluations)

1. Comments related to the organization of the class into groups by random drawing
a. Students should be allowed to pick form own groups
b. Students should be offered option to do a project individually (and not as part of a group)
c. Scheduling of group member meetings was difficult
d. Groups should be smaller than 4/group (e.g., 2/group)
e. Group presentations should not be made during class time (class time should be devoted to course material)
f. Considerable differences among quality of contributions of each group member to overall group effort (noted for only a few of the groups)
g. Group leader did all of the work (noted by two group leaders)
h. Group approach was a good way to learn, very relaxed approach
i. Forcing students to work in groups is a good idea
j. Group work was good idea and fun

2. Comments related to value of the project
a. Project was excellent way to extend learning well beyond class content
b. Projects should all be focused on science and not social issues
c. Project was a waste of time
d. Project challenge was too mediocre
e. It was too easy to earn maximum score for our project
f. Make project worth larger part of grade

Proposed Project Modifications

1. Much more emphasis on group "design" to enhance effectiveness of group approach
2. Groups organized based on appropriate mix of student profiles (gather some information at beginning of course; organize groups based on selected parameters)
3. Will retain Group Leader (but will have selection process modified to increase likelihood that effective group leader will emerge)
4. Specific outcomes questionnaire will be designed and used to assess project effectiveness
5. Method for anonymously evaluating each individual's contributions to group project by other members of group will be developed
6. Project design and requirements will be much more specifically defined
7. Projects will focus on science issues (but exceptions will be made for students who present a thoughtful project description that still heavily involves course concepts)
8. Allow student groups to select own project (must be xxx by instructor)
9. Establish more "constrained" timeline/deadlines
10. Project assessment methods will be more stringent

Appendices

1. Faculty Learning Community Pre-Survey for Participants

2. Faculty Learning Community Mid-Year Evaluation

3. Faculty Learning Community Year-End Evaluation

Faculty Learning Community
Pre-Survey for Participants

Name	Tom Frederick	**Academic Rank**	Professor
Department	Biological Sciences	**Phone Number**	475-2205
College	Science	**E-Mail**	gtfsbi@rit.edu

Number of years employed as a full-time teacher (tenure track) at RIT 26 years

1. Degrees	Institutions	Dates
BS in Microbiology	Ohio State University	1968
MS in Microbiology	Ohio State University	1969
PhD in Microbiology	Ohio State University	1972

2. Professional History

Positions and/or Ranks	Institutions	Dates
Asst/Assoc/Full Professor	Rochester Institute of Technology	Sept 1, 1975-present

3. Briefly describe the nature of your current teaching responsibilities. Include your learning objectives from one of these courses *as stated in your syllabus for that course*.

Microbiology in Health & Disease - lecture-only, non-majors, 50 students
Introductory Cell Biology Laboratory - two laboratory sections, majors, 14/16 students/section
Biology Freshman Symposium - discussion, majors, 16 students

Learning Objectives (Microbiology in Health & Disease) - *NONE published in course syllabus*

4. Indicate your reasons for wanting to participate in this community.

ANY way to enhance the effectiveness of the education of our students is vitally important to my life as a professional educator. Sharing experiences with colleagues who have the same goal is, in my opinion, one of the best, if not the best, ways to reach this goal. The detailed design of a set of projects by the members of the community will allow the close-knit group to seriously investigate, and possible discard if we are honest with ourselves, approaches to teaching designed to respond to the needs of our entire student population.

5. Describe *particularly innovative* teaching activities in which you have been involved (e.g. efforts to improve teaching, development of curricular materials, etc.).

No *particularly innovative* teaching activities. I characterize myself as a "typical" teacher.

6. Indicate two or three of your *most pressing needs* regarding teaching.

Methods of, or approaches to, seriously engaging a majority of my students in in-class dialogue with class sizes of 50-90 (which characterize my lecture-only courses for majors and non-majors) which meet in "auditorium" classroom settings which permit little, if any, movement of the instructor among the students.

Concern that the rather large number of high grades earned by students in my courses may not reflect the breadth and depth of command of the material in the course (and of my efforts as their mentor and educator), but may merely be an example of grade inflation (i.e., students have not truly earned the grade).

7. Part of this program is an individual teaching project pursued by each participant. At this time, what area of interest do you wish to pursue? (Some suggestions are listed below. You may change directions as you learn more about the Program.)

Based on my comments in response to 6. above,

Engaging students large, lecture-only courses in serious in-class dialogues:

Teaching styles
Cooperative learning
Active learning
Leading discussions

Concerns regarding grades in my courses:

Assessment/evaluation
Authentic assessment

8. Part of this program involves working with a faculty member of your choice. Although you need not have a particular person in mind at this time, in what ways would you take advantage of this opportunity and how do you see this aspect of the program as being helpful to you?

I would invite a colleague who is new to the RIT teaching setting (and perhaps new to teaching) to become involved. Working closely with a respected colleague who has a fresh, unbiased approach to the teaching environment here, unencumbered by a teaching style developed over decades of teaching at the institute, would be perhaps the best way for me to reinvigorate my approach to the role of teacher (which may have become stale).

9. Part of this program involves working with a student consultant of your choice. Although you need not have a particular person in mind at this time, in what ways would you take advantage of this opportunity and how do you see this aspect of the program as being helpful to you?

I would invite a student who is articulate, outspoken, articulate and willing to honestly and openly

critique myself and my project. Clearly, this would require deep mutual respect, and absolute trust in me on the part of this student that I am actively seeking to greatly enhance and invigorate my teaching and consider her or his participation to be invaluable. I have rarely, if ever, been critiqued on a continuing basis by any student. The course evaluation process is, at best, a snapshot of my performance, albeit a useful one. Also, the student perspective of the project I would undertake would be immensely useful in directing me to a goal that is essentially one that impacts almost solely on the student population.

10. What do you think you can contribute to the program (for example, certain teaching knowledge or experiences)?

Certainly my "personal collection" of experiences in the classroom and laboratory that did NOT work may be a useful resource to guide program participants away from the tried, but "un-true" aspects of teaching at RIT.

11. Briefly state your philosophy of teaching (or append it to this document).

I don't think I have a philosophy of teaching. I am a very pragmatic person who simply brings to the learning setting an enthusiasm for, and deep respect of, the subject matter in any course I am teaching. If I did not approach a course in this manner, how could I expect my students to so do?

12. Please indicate anything else you wish regarding your involvement in this program.

Nothing comes to mind at this time. I expect that as I become intimately familiar with the program, its structure and my community colleagues I may be able to respond.

Faculty Learning Community
Mid-Year Survey

A. Estimate the impact of the Faculty Learning Community on you with respect to each of the following (rank impact from 1-10, with 10 being the greatest impact):

1. Orientation Luncheon - I did not attend, so I have no response

2. FLC meetings/discussions - impact about 5 at this time. I think that we need to be more consistent with participation by ALL FLC members (myself included). Also, the spontaneous discussions, while quite enjoyable, tend to move us away form any focused topics.

3. Lilly Conference - impact of 8. It certainly helped me to focus on issues I found quite relevant to my teaching (including my project). It was very useful to hear from others who have attempted (with success and failure) some of the ideas I had been considering. I found the sessions that were detail-filled to be the most useful.

4. Your teaching project - It is difficult to assign an "impact". I have found my introduction of a project into my Immunology course to have created much more personal stress that I might have imagined before I accepted the invitation to join the FLC. The anxiety among myself and the students, the considerable uncertainty of the "success" of the project, the actual impact on learning, the attitude among students about the project's value, etc. have all contributed to a (at this time) a quite pessimistic feeling on my part.

5. Collegiality and learning from other FLC members - impact of 10 for collegiality; impact of 3-4 for learning - I have not been able to learn much from other FLC members yet, as we have not really had in-depth discussions of teaching styles, projects, etc. (although I have missed one meeting)

6. Student associate - impact of 10. I have invited 8 members of my Immunology class to join me in critiquing my project as well as some significant changes in the approach to the course discussions (which are project related). We have met once (for 2 hours) and the input (very honest and open) was invaluable. I was able to modify the in-class discussions and do some reconfiguring of the project approach in response.

7. Faculty associate - no opinion at this time. I have NOT interacted very much yet with the person whom I would like to join me in evaluating my project

8. TGI - impact of 9-10. The results and interpretations of this survey was immensely useful in helping me to identify my perceived and real goals for my Immunology course, which were not the same.

9. Books (Classroom Assessment Techniques - impact of 10

10. Supplemental Readings - "Nudge..." - impact of 10. The others, probably below 5 (haven't read them closely)

B. In a similar manner, estimate the impact of the Faculty Learning Community on you with respect to each of the following (rank impact from 1-10, with 10 being the greatest impact):

1. Technical Skills - impact of 5-6. Vinnie's comments about my approach to problem-based learning was very useful.

2. Total effectiveness as a teacher - difficult to assess yet.

3. Interest in the teaching process - impact of 9-10. I rather enjoyed hearing the different approaches to teaching/learning, and found that some of the aspects of others' to be quite interesting

4. View of teaching as an intellectual pursuit - impact about 4-5. We really have not focused on this topic very much.

5. Understanding of and interest in the scholarship of teaching - impact of 8-9.

6. Awareness of ways to integrate the teaching research/experience - impact of 4-5. I won't realize the actual affect of the FLC until I have had much more involvement in assessing the outcomes of my courses after implementing some of the ideas we have discussed and were presented at Lilly

7. Understanding of the role of a faculty member at RIT - impact of 8-9 with respect to our role as educators in the learning process for students

8. Perspectives beyond my discipline - impact of 5-6. I think this will change as I have the opportunity to view other FLC members "in action"

C. What have you valued most from participation the FLC - clearly it has been the collegiality among the members

D. How has teaching and perception of myself as teacher changed - I have been encouraged to expand my definition of the role of the instructor in the learning process, and to recognize many of the issues that make for successful learning.

E. What first-quarter aspects could be changed? - Although others may disagree, I think we should meet MORE OFTEN. Also, we should meet in a physical setting more conducive to personal interactions (e.g., the setting at the Miami Inn stimulated a LOT of personal interactions in one hour than have probably had in all of the meetings in COE combined).

Changes for the rest of the year - same as for "first-quarter" (above), and more defined topics to form bases for each meeting

F. Progress of teaching project

1. Course - Immunology (Winter Quarter, lecture-only, 3 one-hour classes/week, 86 students in 08-A300)

2. Goals of the project - To encourage students to take the facts and concepts of the course and use them to make informed opinions about, or develop sound approaches to, major, current issues for which an understanding of immunology forms a considerable foundation

3. Implementation of project - refer to website for the course at http://www.rit.edu/~gtfsbi/imm/grading2001.htm#project

4. What is timeline for the project? - last day of class. However, groups have been encouraged to interact with myself as they further define their projects. This will likely result in several groups completing their projects before the end of the quarter. At the end of the quarter, I will be asking all students to (anonymously) evaluate the project and impact on their learning in the course.

5. How will you assess the outcome of your project? Based on the written comments from students (see 4 above) and from comments shared by the eight students who form my "Student Associate(s)". Also, the depth and breadth of the projects (especially useful to compare among several groups that selected the same project). What will be difficult to assess is the value of the "group" approach to the project. I have heard only two "complaints" from students who did not like the group approach. Since I gave each the student the option of including or excluding me from their on-going discussions, I will likely ask each group leader to assess the value of the group approach at the end of the quarter.

6. How do you plan on involving your Faculty colleague? He has had considerable experience with group projects. I will be seeking his advice as to assessing the effectiveness of project, troubleshooting it during the quarter, dealing with the large number of students involved, etc.

7. Involving student colleague(s) - see A.6 and B.5

G. Additional Comments - none at this time

Tom Frederick

Biological Sciences/College of Science
12/28/2001

Faculty Learning Community
Year-End Survey

A. Estimate the impact of the Faculty Learning Community on you with respect to each of the following program components. Circle the number on the scale below which reflects your judgment. "1" indicates a very weak impact, and "10" a very strong impact. Also, if you have brief comments to make about any of the items, use the space provided.

1. Orientation luncheon

1	2	3	4	5	6	7	8	9	10
weak impact									strong impact

NA - Did not attend the luncheon

2. FLC meetings/discussions

1	2	3	4	5	6	7	8	9	10
weak impact									strong impact

8-9, got much better as we became more comfortable and familiar with each other

3. Lilly Conference

1	2	3	4	5	6	7	8	9	10
weak impact									strong impact

10 - VERY influential on my choice of project; also exposed me to many Faculty with similar ideas

4. Your teaching project

1	2	3	4	5	6	7	8	9	10
weak impact									strong impact

7-8 - After some early concerns and in response to many excellent suggestions solicited from students, my project was reasonably successful

5. The collegiality and learning from the other FLC members

1	2	3	4	5	6	7	8	9	10
weak impact									strong impact

10 - an excellent working relationship also led to meaningful personal interactions

6. Student associate

1	2	3	4	5	6	7	8	9	10
weak impact									strong impact

10 - the seven students who helped me critique my project were incredibly valuable

7. Faculty associate

1	2	3	4	5	6	7	8	9	10
weak impact									strong impact

NA - I did not involve a Faculty associate

8. TGI (Teaching Goals Inventory)

1	2	3	4	5	6	7	8	9	10
weak impact									strong impact

8-9 - clearly helped me to define my goals, both overt and covert; led to the fundamental goal of my project

9. Books (*Classroom Assessment Techniques, Teaching Tips)*

1	2	3	4	5	6	7	8	9	10
weak impact									strong impact

8-9 - BOTH were excellent resources and written in a way that made them useful and applicable to my classroom situations

10. Supplemental readings

1	2	3	4	5	6	7	8	9	10
weak impact									strong impact

7-8 - "Nudge" was superior; the others were less useful but still provided some ideas

B. In a similar manner, estimate the impact of the Faculty Learning Community on you with respect to each of the following outcomes.

1. Your technical skill as a teacher

1	2	3	4	5	6	7	8	9	10
weak impact									strong impact

9-10 - What I discovered as I implemented my project will clearly aid me in dealing with student groups and group dynamics as learning modes

2. Your total effectiveness as a teacher

1	2	3	4	5	6	7	8	9	10
weak impact									strong impact

Difficult to assess

3. Your interest in the teaching process

1	2	3	4	5	6	7	8	9	10
weak impact									strong impact

9-10 - Has had a very positive impact on my interest in trying out new methods to instruction in large, introductory lecture-only classes

4. Your view of teaching as an intellectual pursuit

1	2	3	4	5	6	7	8	9	10
weak impact									strong impact

8-9 - I discovered that teaching can be studied using the same methods applicable to scientific investigations; I was particularly interested in the data presented in several of our readings - some of my opinions related to student evaluation of instruction were altered, based on the evidence presented

5. Your understanding of and interest in the scholarship of teaching

1	2	3	4	5	6	7	8	9	10
weak impact									strong impact

8-9 - Although I am impressed by the body of evidence related to methods of teaching and learning, I am less interested in pursuing a defined teaching research project

D. Describe how your teaching and your perception of [illegible] they have) as a result of your involvement in the Faculty Learning Community.

More sense that what I thought were unique (to me) problems and concerns were, indeed, quite commonly shared by others, including some of the best teachers at RIT (e.g., Eisenhart teacher)

E. What aspects of the Faculty Learning Community program could be changed to make it more valuable for future FLC members?

The actual setting for our sessions greatly influenced our interactions. Smaller, more intimate settings were, by far, the best. Perhaps selecting ONE major issue in teaching/learning and making that issue the central

6. Your awareness of ways to integrate the teaching/research experience

1	2	3	4	5	6	7	8	9	10
weak impact									strong impact

6-7 - still not fully familiar with methods for collection of valid data to make statistically significant assessments of outcomes

7. Your understanding of the role of a faculty member at RIT

1	2	3	4	5	6	7	8	9	10
weak impact									strong impact

NA - I'm not sure if the FLC integrated itself into the greater RIT community to allow any response to this query

8. Your perspective of teaching, learning, and other aspects of higher education beyond the perspectives of your discipline

1	2	3	4	5	6	7	8	9	10
weak impact									strong impact

8-9 - Definitely useful to see how the other members of FLC approached projects based on their own teaching settings and disciplines; some aspects of projects were common (e.g., groups) and substantiated opinions that there are many shared aspects of teaching/learning among widely disparate disciplines

C. What have you valued most from your participation in the Faculty Learning Community?

Collegiality - there has been NO other experience during my entire time at RIT that has brought me closer to colleagues outside of the sciences