

**Peer Review of Teaching**  
**Exercise: What information do you need?**

Read the following summaries of teaching responsibilities. If these summaries were included in a packet of teaching materials that you were reviewing, what other information would you want regarding the teacher's responsibilities? What other materials would you want to examine in order to make a judgment about the teacher's effectiveness?

*ESPY 5140: Advanced Adolescent Growth and Development (taught four times)*  
*This course covers development from age 12-21. Topic areas include methods of inquiry, biological, cognitive, and social development, cultural influences, school achievement, moral development, and "sex, drugs and rock-and-roll." Students (primarily high school teachers earning an M.A.) are required to complete assignments, keep a reading response log, lead one discussion session, write three critiques of relevant research, and conduct an in-depth case study of one individual. The primary goal of the course is application of abstract theories and principles to daily practice.*

*Fall and Winter Quarters, 1999-2000, The Ohio State University, Columbus, Ohio*

*As instructor of record, I was responsible for all aspects of an "American Civilization, 1877-Present" course, each with more than forty-five students. This involved choosing course themes, creating the syllabus, writing and delivering almost fifty lectures, producing PowerPoint presentations or overhead slides for each lecture, devising study guides, writing and grading exams, holding regular office hours, creating and maintaining a class web site, and handling all administrative aspects of the course.*

## Peer Review of Teaching

### Exercise: Looking at information from self and information from students

*Consider the following teaching philosophy statements and summaries of student ratings of the instructor. What observations do you have based on this information? What evaluation statements would you be willing to make? What additional information would you want?*

## Graduate Teaching Associate Department of Psychology

I love being a student. There are few things that thrill me as much as learning new ideas and stretching the bounds of my knowledge of the world. Throughout my student life, I have always admired teachers because I saw them playing an invaluable role as facilitators in the process of learning. As the daughter of two teachers, I was always proud of my parents and the role they played in the lives of their students. I always assumed it was the combination of their dynamic personalities, their knowledge, and their humor that made them wonderful teachers. Because I am similar to my parents, I always assumed that teaching would come naturally to me. When I was eighteen, I led my first class at an academic summer camp and I was literally overwhelmed with the difficulty of teaching. I had no idea how much preparation goes into a one-hour lecture or how much patience it takes to manage a classroom. This experience was important because it taught me that I love teaching, but it also gave me a healthy respect for the work that goes into creating both the materials for and the environment of a classroom.

I believe that my skills as an instructor are constantly evolving. Over the past two years, I have watched at least six other instructors teach. I enjoy going to watch other instructors because I believe that all other teachers can teach me something through their skills and strengths that are often different from my own. A fellow instructor asked me why I still observed others, as this is typically something only done by new instructors. I struggled to respond to this question because I think experienced teachers, as well as new teachers, can benefit from watching others. I believe that my surprise at the other instructor's question really illustrates my general attitude toward teaching. I do not think of teachers as "good" or "bad"; for me, the measure of a teacher's success is whether or not he or she is working to improve. One of my goals as a teacher is to never take my teaching skills for granted. To that end, I treat each group of students as a new set of teachers who can help me learn how to better meet the needs of students in the future.

There are several overarching goals that I have for my classroom, all of which are based on my beliefs about how students learn. First, I believe that students learn the best when they feel comfortable. As a result, I always try to create the kind of classroom where students know I am excited to teach them and an environment in which students feel encouraged to participate. I am genuinely interested in the lives of my students and I try to express this to them. For instance, I like to arrive to class fifteen minutes early and play music while talking to my students about their week. Many students have commented that such conversations put them at ease. I also believe that it is important to be explicit about my desire to make sure they are having a good experience in my classroom. I invite them to share their concerns with me at any time and I stress the importance of my mid-term evaluations as an opportunity for students to help me tailor the class environment to their needs. I begin my class each quarter with a discussion of the importance of respect in our classroom, which enables me to facilitate discussions in such a

way that students are more likely to be respectful of each other. Another way in which I empower student participation is by providing positive feedback wherever appropriate. Finally, I know that students have a variety of learning styles and not all students are comfortable with making comments in class. Thus, I try to create many opportunities for a variety of types of participation; I conduct in-class experiments, do demonstrations and take frequent in-class polls to encourage less-verbal students to participate.

Second, I believe that students will retain more of what they learn in a course when they have some ownership over their learning. To that end, I focus on active learning and the use of examples to give students the tools to apply the knowledge that they learn in my course. I never want my students to feel like passive receptacles for knowledge because I believe that there is more learning achieved when students can learn from both the instructor and each other. For example, I typically begin class by having students brainstorm about the topic of the day and I reference specific student's comments by name throughout the lecture, to build in a sense of ownership. I have found that with a series of leading questions, I can often get students to intuit most of the major theories that we will discuss in a given lecture and this seems to enhance student learning (e.g., students will often intuit all six of the major motivational theories when presented with the question "what are some reasons people might get a tattoo?"). I really focus on the use of examples in my classroom and for each major topic covered, I try to reference well-known movies that demonstrate each concept. I also try to use common experiences to describe phenomena. For example, using the fact that high school students often get treated badly at restaurants because the server thinks they will not tip as an example of self-fulfilling prophecy. By seeing examples that connect what they know to what they are learning, students learn concepts more completely. Another reason that I use examples is to show students how to see Psychology in their everyday lives, which means that their learning can continue long after my class is over.

Third, I believe that critical thinking skills are important to student success and that teaching critical thinking through course content can improve student learning. In addition, I believe that teaching students scientific writing must be conducted with a focus on critical thinking and the logical placement and progression of ideas. Many of my assignments in the form of quizzes, tests and papers require students to answer questions with no "correct" answer. Rather, I prefer to ask my students questions that force them to synthesize the topic and defend a position. This allows me to build practice for critical thinking into my classroom. By forcing students to fully think out ideas, and not just to take notes on my lectures, I am able to promote critical thinking skills, which I believe to be integral to future academic success. When I have students write papers, I give detailed grading criteria and long paper prompts so that students can develop the logical structure of their argument in both written and oral communication. In addition, I teach students the background of the scientific method, so that they can become informed consumers of knowledge; instead of relying on intuition, they will have a flexible strategy for answering a myriad of questions in psychology.

Fourth, I believe that students learn better when instructors model behavior that they seek to promote in their students. I think that students learn from more than just the lectures and the textbook; an integral part of learning is watching the behavior of the instructor in a variety of situations. As an instructor, I try to model appropriate classroom behavior, the role of constructive criticism and affirmation, and a love of Psychology. I have found that students tend to get more positive in their verbal and non-verbal feedback to other students as the quarter passes and I like to believe that they are modeling my reactions to their classmates. Because I have a passion for both psychology and teaching, I find that most students see me as very

enthusiastic. I believe this enthusiasm to be contagious and I have had many students go on to take more courses in psychology and become research assistants in the department.

When reading my mid-term and end of the quarter evaluations, it seems that my students perceive the practices related to these goals on my part. Students consistently comment that the class environment is comfortable, that I am genuinely interested in their learning and in them as people, and that the class activities are helpful. I usually try to include at least one active learning activity in each lecture and I try to incorporate some discussion in every class. These activities range from group work to create advertisements for different parts of the brain to an in-class experiment in which students determine the effect of candy on memory as a way of learning the components of the scientific method. Former students have told me that these active learning methods stay with them after the course, which attests to the effectiveness of such activities in promoting ownership of learning, even after the conclusion of the class.

Teaching psychology is my passion. There is nothing else in my professional life that brings the same joy and exhilaration to me as giving a lecture where students are learning and engaged. While I am fortunate to have found something I am so passionate about, I feel that I have a responsibility to work hard for my students. It is a great gift and a great responsibility to share the subject matter I love with others. I am truly grateful for the opportunity to teach Psychology and I only hope that I am always doing a service to my students.

### **PROFESSIONAL DEVELOPMENT**

Because I want to improve my teaching, I have participated in a variety of development activities to continue growing as a teacher. I have attended workshops for instructors on managing the classroom, leading a discussion, creating classroom goals and assessing progress, preparing a teaching portfolio, and engaging students. In addition to these workshops, I was selected as a Psychology Department representative for a university-wide Writing Across the Curriculum workshop. I have also been selected to facilitate workshops in the Psychology Department for other instructors on leading classroom discussions and grading papers. This summer, I was selected by the Psychology Department to serve as the graduate TA for the practicum component of the summer teaching course in psychology (Psychology 852). In this role, I will provide feedback to new instructors on their lecture preparation strategies and presentation style. At the university level, I participated in the Office of Faculty and TA Development's New TA Orientation in the fall of 2004. At this university-wide program, I led sessions on managing the classroom, developing effective presentation skills, preparing for the first day, and teaching for an inclusive classroom. I will participate in this New TA Orientation program again in 2005 as both a facilitator of individual sessions and as the keynote speaker. I have found professional development opportunities very helpful in my own teaching, and feel strongly in giving back to those programs whenever I can.

# Summary of Student Feedback

## Psychology

### The Ohio State University

Over the past 5 quarters, I have received consistently high SEI (Student Evaluation of Instruction) ratings. The SEI ratings are mandatory, and are completed at the end of the quarter. Students are asked to rate instructors on a scale of 1 (poor) to 5 (excellent) on the questions in the table below. As a teacher, the fact that my ratings are consistently high is gratifying, but I still believe that there is more work to do. Two of my primary areas of focus have been related to the 8th and 9th questions on the SEI item; I am very concerned with creating a good classroom atmosphere and communicating clearly to my students. I love teaching and I love psychology; this is my passion and one of the reasons I came to OSU for graduate school was that I knew I would have the opportunity to teach my own classes. I want to do a service to my discipline and also to my students and, as a result, I always seek to make my class a better experience for my students. To me, this begins with creating a comfortable environment and making a space in which students are not afraid to ask questions and share their experiences.

	<b>Psych 100 AU 04</b>	<b>Psych 100 WI 05</b>	<b>Psych 367 AU 03</b>	<b>Psych 367 WI 04</b>	<b>Psych 367 SP 04</b>
<b>Instructor well organized</b>	4.55	4.66	4.90	4.75	4.95
<b>Intellectually stimulating</b>	4.55	4.50	4.55	4.65	4.85
<b>Instructor interested in teaching</b>	4.86	4.90	5.99	5.00	5.00
<b>Encouraged independent thinking</b>	4.66	4.42	4.70	4.70	4.80
<b>Instructor well prepared</b>	4.76	4.84	4.95	4.90	4.95
<b>Instructor interested in helping students</b>	4.86	4.88	4.95	4.85	4.95
<b>Learned greatly from instructor</b>	4.76	4.74	4.70	4.60	4.85
<b>Created learning atmosphere</b>	4.72	4.70	4.75	4.75	4.90
<b>Communicated subject matter clearly</b>	4.76	4.86	4.80	4.80	5.00
<b>Overall Rating</b>	<b>5.00</b>	<b>4.84</b>	<b>4.90</b>	<b>4.95</b>	<b>4.85</b>

In addition to the end of the quarter SEI ratings, I administer open-ended questionnaires at both the middle and the end of the quarter. Their mid-quarter evaluations assess their attitudes toward the lectures, notes, review sheets, my pacing, the course notes, and the course as a whole. This gives me an opportunity for a mid-course correction if there are things that are not working for a particular group of students; almost every quarter I have taught, I have made

changes on the basis of that individual class' needs. These open-ended evaluations have been invaluable for suggesting areas for improvement and highlighting what works. I have summarized the main themes of my student's open-ended evaluations below. I am pleased that the themes of my student comments are consistent with my overarching goals for both classes, including: promoting critical thinking, creating a comfortable environment, encouraging active learning, and creating interest in Psychology.

### **1. Activities well integrated and in-class use of examples**

- Psychology 367 – “I really liked how Leslie used a lot of examples so that concepts were more easily understood”; “I love the examples that you give to help us remember things...they are usually hilarious and memorable”
- Psychology 100 – “Various examples, presentations, small group discussions, and even skits are used to make materials easy to understand. It's so amazing if you attend her class and observe how she connects with students in class and makes the class participate”; “Presentations are often related to everyday life. You make good connections to stuff we know and watch on TV”; “She is extremely good at connecting the course material with everyday life examples. This made everything more relevant and easy to learn for the students. She's great and I love her class!”

### **2. Encouraged participation**

- Psychology 367 – “You are a great teacher, you let everyone get involved and make it much more fun than most lectures”; “I've never had a teacher who was so friendly and really interested in what students had to say”
- Psychology 100 – “Leslie is a great instructor because she constantly reminds her students that she is willing to listen to anything they have to say. She is always helpful and always appreciative of new comments and questions during lectures”; “I really liked the atmosphere. People felt more open expressing themselves”; “I...like the encouragement you give for us to get involved in the lectures.”

### **3. Well organized and prepared**

- Psychology 367 – “I really liked how prepared Leslie was for each class and how she always had handouts on the material to help us completely understand it”; “Leslie put forth so much effort to teach this class. Since this class is concept based, she made it very interesting with movies, comics ...and her stories”
- Psychology 100 – “I like the effort that you put forth in your teaching. It is very apparent that you care about the subject, the class, and the students. I have friends in different sections of this class and the differences are obvious”; “Leslie was a very good teacher I thought. She made class interesting and fun. She knew what she was talking about and if she didn't have the answer to our questions she would look them up and get back to us. She was also very helpful and friendly”; “I really liked the PowerPoint presentations. They were well organized and seemed like Leslie put a lot of time into them”

### **4. Encouraged attendance**

- Psychology 367 – “I really enjoyed this class. After all, my attendance in here was far better than in any other class!”; “I came to class because you made the lectures interesting even when the subject matter was boring”; “I loved this class. This was the

only class that I wanted to attend”; “I feel that you are one of the best profs that I have ever had as a college student. You make me excited to come to class”

- Psychology 100 – “I really liked having notes posted on the web—they encouraged us to come to class to get more information”; “She was an awesome teacher and I liked coming to class even though we didn’t get attendance points”; “You made me feel good about coming to class”; “Leslie did a great job. I never missed a lecture and they were always stimulating. It was not a class that you fall asleep in. I know it was because of the way that Leslie made all of the material easy to understand that I enjoyed and understood the material so much.”

## **5. Friendly/Creates a comfortable class environment**

- Psychology 367 – “I really like that even if I am in a bad mood before class starts, your positive and funny nature always quickly puts me in a good one”; “Any student will tell you that presentation is only part of an effective learning experience. It seemed to be in her nature for Leslie to go out of her way to assist students, whenever they needed it. Leslie brought personality to our classroom. She is a model not only for students, but teachers as well”; “I really liked the comfortable class setting and constant encouragement for participation”; “I really liked her positive attitude and her wanting to make sure that we all understood the material”; “I wish that Leslie would relay to other professors how to interact with students”
- Psychology 100 – “You are the greatest TA ever!! So much fun, so nice and you really made us ...think and relate with people around us. This class was more like ‘experiencing’ than learning from books”; “I really liked how my instructor taught the class. She made it interesting, easy to digest and understand the materials, and fun”; “I’d like Leslie to know that she is one of the best TAs that I have had and really appreciate that you take the time to learn everyone’s name and is so friendly”; “She has been one of my favorite teachers here. You can tell that she truly enjoys teaching and actually wants you to do well in the class”; “Leslie was very strong in communication, knowledge of the topics, preparedness, relationship with students and overall effectiveness. This was one of the classes I actually looked forward to going to”; “She has been one of my best teachers so far here at OSU. When you sit in her class, you feel very comfortable because of the good atmosphere she has created”

## **6. Excitement for teaching**

- Psychology 367 – “You’re very exciting to watch. Even if the topic is on the ‘boring’ side, you find a way to make it interesting. I can tell you are passionate about your work. That passion makes the BEST teachers”; “I really liked your enthusiasm! You made material seem interesting no matter what it was. The way that you presented the material made it all seem logical and simple even when the ideas were challenging”; “Your teaching style is great and it’s teachers like you that make me want to keep working toward being one myself. Although I may have to have three cups of coffee before each class to be as energized as you”; “It was obvious that Leslie is very passionate about the subject of social psychology. She is the best lecturer I have listened to at Ohio State. She repeatedly provided excellent and entertaining examples relating social psychology concepts to real life. Also, she was more than willing to go above and beyond the duties required of a teacher. If students had any problems she cleared up confusion via email at all hours of the day, which was very helpful. I was amazed to learn that we were her first class!!!”

- Psychology 100 – “I really did enjoy class because you seem like you really love what you do! You’re enthusiastic and helpful and excited about your students and teaching. More profs should be like you!”; “Your enthusiasm was awesome. Very easy to pay attention and learn”; “I like the way you are always happy to be in class and smiling. When you are having fun being here it makes me feel like I should pay good attention and learn”; “SHE ROCKS!! I will send my kids to her if at all possible”

## **7. Concerned with student success**

- Psychology 367 – “I learned a great deal from her, especially how to write better essays. I feel she pushed me to develop as a writer and it clearly improved my communication skills”; “My comprehension of social psychology not only lasted for the duration of that quarter, but is still demonstrated in other subjects...I would not have been able to rise to the occasion if Leslie had not raised the bar”
- Psychology 100 – “Leslie has helped me to succeed in this class”; “You really seemed to care how well we did and if we enjoyed class”; “I doubt I would have done nearly as well if I didn’t have you up front keeping things interesting”

## **8. Created interest in Psychology**

- Psychology 367 – “I’ve been meaning to tell you how much I enjoyed your class. SO much in fact that I’m changing my major from pre-med to psych...It was one of the most interesting classes I’ve taken and I know from experience that the professor is usually a huge factor in this, so thank you!”
- Psychology 100 – “After I took Leslie’s class, I changed my major to psychology. I was so attracted to this field and very excited about major change”; “I think you’re a great teacher, best I’ve had at OSU. Class was interesting and fun, generated an interest in psychology for me”; “Her passion for teaching and psychology really got people interested in something they may not have expected to enjoy”; “After taking this class, I feel that the field of psychology is AWESOME. I want to thank you for this. I’m hooked now”; “She’s an awesome teacher...probably the best I’ve had here. I learned so much and was so interested because she made it interesting”

## **Comments from Student letters written in support of Department Award for Exemplary GTA Programs**

“ Each of her lectures was an effective mixture of information, demonstrations, real-life situations, and video clips presented in a manner that enticed us to listen. The concepts discussed in this class will stick in my mind because of the unique way in which they were discussed”; “She had such a wonderful personality and was very enthusiastic about social psychology. When a teacher is so excited about a subject, I think it rubs off onto the students. She always made learning fun, which gave us the desire to learn more”; “Leslie has been different from all the teachers I have had because she came off to the class as a real person, not just a teacher that got paid to teach us. I felt that she was concerned about me as a person”

## **Feedback sent through the FTAD “Thank a Prof” system**

Winter 05 - Leslie gave real world examples and seemed to have a great sense of humor. She has a real passion for teaching and it shows! I enjoyed the class and it has influenced me to

take other psychology courses and maybe to be a research assistant in the department! I enjoyed Leslie's class and look forward to many more classes with her!

### **Unsolicited student feedback**

1. Hi Leslie. I thank you for your amazing energy and hard effort you put into psy 100 class. I learned a great deal about a whole spectrum of different branches in psy. This was one of the top 5 classes I've ever taken including my years at Washington U. I think you are excellent at motivating people to enjoy the class and do their best. It seems like there is a subtle contamination of your energy among students while you are lecturing and all of us get connected and bonded somehow to make a great class altogether. It's just incredible to see how different your approach to teaching is from others. I can at least say you are gifted...you and this class will be remembered for a long time...I will miss all the great things you shared in psychology 100...Best Regards, K. (email sent 12/3/04)

2. Leslie, I just wanted to be the first to thank [you] for such a great quarter. I honestly can't believe you've only been teaching a short time. You have definitely found your calling. Your class is the first and probably the last that I will miss coming to, C. and I talked about that after class today...I noticed that the lectures the past two or three weeks have gone together really well with the handouts. That was one thing I mentioned in my student review. I really respect teachers who take feed back and do something about it...thank you for making the class fun and educational. It's amazing how much material I have already applied to my life. What a blessing...L. (email sent 5/27/04)

### **My response to student feedback**

When giving out course evaluations, I always try to impress two things upon my students. First, I take their feedback seriously, and I have made changes every quarter to make the class better on the basis of student suggestions. I tell them that I do not just want to hear what they liked; I try to express the importance of constructive criticism, especially concerning those portions of the course over which I have control. Second, this information is important to my future, and the feedback they give has a real impact on my ability to continue teaching at OSU and my development as a teacher for future jobs.

Over the past five quarters, I have made a variety of changes to the course based on student feedback that I have received on mid-quarter evaluations. My students in both Psychology 367 and Psychology 100 have had three primary concerns with me as a teacher at mid-quarter. First, some students think that sometimes I move too quickly. To respond to this criticism, I have learned to survey the room, and I do not move to the next slide until all of the pens have stopped writing. In addition, with particularly information-dense slides or difficult concepts, I default to giving at least two examples (instead of only one). I find that giving more examples gives them time to write, and offers more opportunity for them to connect what they are learning to things they already know.

Second, I have received a variety of suggestions about the notes that I provide. Initially, these notes were skeleton outlines of my lectures. Over the past two years, I have added an outline structure (roman numerals, letters, numbers, etc) to my notes and my PowerPoint presentations, so that it is always easy to find the material being presented on the notes. In both 367 and 100, my students have suggested, with particularly research-heavy or conceptually dense lectures, that I include more information. As a result, I have started to include more

information on handouts in these cases, including key definitions and preliminary research findings. I feel that this ensures that students are trying to understand, and not just write down what's on the screen. I also find that this allows confusion to be cleared up in class and offers my students an opportunity to learn from each other's questions.

At the end of winter 2005, one student made the following comment on their open-ended evaluation: "[Leslie] always made sure she wasn't going too fast. Later in the quarter, (she) made more notes available, so I was writing less and learning more." I would like to believe that this suggests that I was making progress toward the goals that I set for myself in regard to potentially moving too quickly, and in improving the course notes. I rarely receive any negative comments concerning my pacing or the notes on the final open-ended evaluations, which I take as a sign that I am doing a fairly good job correcting my pacing and notes for the needs of each individual class.

Third, some students suggest that more review for exams would be helpful. It is interesting to me as an instructor to get this feedback, because I am one of a minority of TAs who offers both review sheets and out-of-class review sessions in both 367 and 100. In addition, I am available over e-mail to answer their questions, and I hold weekly office hours that I encourage them to treat as an opportunity to review for tests. The students concern has caused me to explore ways to build reviewing into the course. Whenever we come back to a concept from earlier in the lecture or in the course, I always try to ask my students if they remember the concept in question, and I ask them to generate at least one example of the concept in question. Again, I believe that this provides an opportunity for them to learn from each other, which creates a better learning community than if answers always come from me.

Over the past two years, I have gotten consistently positive feedback for incorporating movie clips, television clips, and music into my class. As a result, I am constantly vigilant for any new audiovisual material that could be used in my course. In my winter 2005 course, I added 8-10 new video and television clips to my class that I did not have in the fall. I also get consistently positive feedback for the examples I use in class. I am always on the look out for new examples and keep a record of new examples to use in future quarters, including those suggested by my students. I even offer an extra credit question on my final quiz asking my students to think of an example of one of the concepts from the course and I tell them that I will use some of these examples in the next quarter. Even though I consistently receive high ratings on the SEI measure, I am always seeking new material that might improve the course, and my personal goal is to feel like I am never complacent; I feel best about my teaching when I am attentive to the needs of my students, and working to make the class better.

# Philosophy of Teaching Statement

## Department of Chemical and Biomolecular Engineering

“Teaching” ranks amongst the nation’s top five prestigious professions where one is involved in shaping the future of the country. My first academic teaching experience began in my third grade math classroom when my teacher selected a few top scorers in that class to tutor the weaker students on a one-on-one basis. My extrovert nature and zeal towards helping my classmates and other tutoring activities through my academic career has slowly developed the “teacher” in me. I firmly believe that the best way to learn is to teach and one continues to learn all through one’s life. In addition to faculty input, and discussions with peers, my students’ responses are the best source for improving my teaching techniques which are evolving on a continuous basis.

Understanding how people learn is one of the significant aspects of teaching. This is linked to their “knowledge” background and maturity. It was an interesting experience when I was trying to explain my scientific research (related to global warming and hydrogen economy) to my engineering peers, research scientists from industry, my 70 year old landlord (a high school graduate) and my 5th grade cousin. The key is to relate to the audience by starting from what they know and building upon it. Providing real life everyday examples makes it very easy. Specifically, I relate “cooking vessel” to a batch reactor where you add the ingredients and the product is formed at high temperature. “Decaffeinated coffee” is an example of novel product design which satisfies the “coffee” loving consumers but prevents the harmful effects of caffeine. Thus, I tell my students that their future role is changing from that of creating new processes to make an existing product (regular coffee) to that of synthesizing newer, less toxic and safer products (e.g. decaf). I try to understand my student’s knowledge level by conducting surveys, through in-class discussions and one-on-one interactions.

Chemical engineering is an applied field where students constantly apply the fundamental concepts and theory learned in the classroom, including other disciplines. My main goal is to encourage independent thinking and analytical reasoning to augment their problem solving skills, thus encouraging them to not just memorize. I prompt them to question at every stage: “why?..how?” and satisfy their curiosity, instead of assuming the instructor is always right. My favorite approach was: “If you don’t have any question I have some for you”. This prompts classroom discussions which are very useful and led to several intellectually stimulating questions/arguments which are not easy to answer. The idea is to provide hints and “baby steps”, building on what they know, and lead them to the answer by making them think logically. The confidence they had gained from this exercise was revealed when they tackled the “question and answers” after their group presentations!

Chemical engineering also involves a significant amount of teamwork. Several industries where students find employment emphasize the need for a “team player with good interpersonal skills”. For this purpose, I strongly advocate design projects involving student groups, which provide students with vital opportunities to effectively work as a team. These projects are useful learning tools where the students assimilate and implement all the concepts they have learned in the classroom to bring the project to fruition, write a report and make a presentation. However, on many occasions, I have seen the student groups allowed to work “independently” as a team without significant supervision. This defeats the basic purpose of initiating group work. The students need mentoring not only in the technical aspects of the project but also in group

interaction and effective teamwork. While the team work and interpersonal skills are acquired through experience, the teacher plays a crucial role in identifying their position in a dynamic group. A teacher should discuss various teamwork-related problems they might encounter and guide them through the process. I try to achieve this by spending significant time with each group. Besides, I also mentor individual students, keeping advice within the realm of the group.

A teacher should be totally involved with the class, dedicated to his/her students and be prepared to devote time and energy for them. Love for teaching evokes passion and dedication. The enthusiasm of a motivated teacher rubs off on his/her students, who derive the inspiration and encouragement which actuate their desire to learn. This keeps the students interested and they tend to retain the course material very well. Every module should clearly state a take home message for the students. I know through experience that whenever my past students approach me for help for another course, I am pleased to realize during the discussions that they have retained most of the important concepts.

In addition, a good teacher needs to personalize the needs and problems of the students. This is observed in case of a few of the weaker, shy or some international students who need additional help and but hesitate to ask for it. In my opinion, identifying the students by their full names and knowing some background information (like state, city, and country) is very beneficial. I obtain most of this information subtly through my numerous interactions with them during my office hours. Having good sense of humor is an added advantage. I believe that the best in a person comes out in a non stressful situation. Students tend to learn more effectively from an approachable teacher who sets up a comfortable atmosphere conducive to learning. Thus, the education goes beyond the classroom and students tend to visualize the teacher as a role model from whom they seek universal advice on topics ranging from fundamental concepts to future careers options, other personal problems and recommendations. Eventually some of the past students evolve into useful professional and industrial contacts who stay in touch long after they have graduated.

A good teacher should have sound fundamentals and command over the concepts as well as a broad knowledge beyond the realms of the particular course being taught. Thus, he/she can provide useful inter-disciplinary examples which make learning very interesting and motivates the students. Good course material with sufficient problems/examples and case studies is very effective. While advance preparation is essential, I believe that there should be enough room for flexibility and I tend to adapt to the requirements as the course proceeds. This was especially true in case of open-ended design projects where the material was modified appropriately depending on the group's performance.

Technology is very useful and should be utilized effectively. I feel that "seeing is believing" and so audio-visual aids like using power point slides for lectures, providing hand outs, showing video clips to emphasize important points, and using WebCT are effective learning tools with proven impacts. In addition, I encourage the use of state-of-the art softwares to stay in tune with the needs of the chemical/process industry. On one occasion, my students found it difficult to learn complex (and expensive) process simulation software and it was impossible to have 53 computers in the classroom with appropriate licenses. So I had to innovatively prepare "power-point" slides which imitate the software. They found this very useful and were able to use them effectively to learn the software. In future I plan to incorporate in-class problem solving worksheets during recitations. In addition, I would like to organize plant trips to specific chemical/process/utility industries so that the students see "in live action" what they have read and retain it effectively.

My students, peers and faculty describe me as dedicated, enthusiastic, approachable, resourceful, organized, innovative and knowledgeable with a keen attitude towards helping students. Finally, I believe that the role of a teacher is that of a leader where you have to show the path, motivate, encourage, and lead by example. Perspiration follows inspiration which means this task is going to involve hard work, and dedication. However, the rewards are immense as I enjoy this activity. My success lies in seeing my students succeed and I experience it when I see my students move on to industry or graduate school. Recently, my ChBE H783 Undergraduate Honors Research student won the “Outstanding Undergraduate Award for Research Excellence” conferred by the Department of Chemical and Biomolecular Engineering. This gives me an immense sense of accomplishment and motivates me to continue my teaching.

## Summary of Student Feedback

### Chemical and Biomolecular Engineering The Ohio State University

**“Mahesh is organized, well prepared and has an excellent teaching style – he explains with enthusiasm, in a stepwise manner and at a level that makes even difficult concepts understandable” – Student quote from ChBE 630 evaluation (summer 2004).**

All the courses I have taught are undergraduate level courses for juniors or seniors majoring in Chemical Engineering. The graduate students at the Department of Chemical and Biomolecular Engineering (**ChBE**) hold positions as “Graduate Research Associates” but are required to serve as a “Teaching Associate” for the departmental courses for one quarter every academic year. The ChBE department uses its own departmental feedback forms to evaluate teaching associates. Based on this feedback, the department presents the competitive “**Outstanding Teaching Associate Award**” every quarter. The classroom courses which I have taught so far are:

- ChBE 760 (Autumn 2004) Chemical Engineering Economy and Strategy
- ChBE 630 (Summer 2004) Chemical Engineering Unit Operations Laboratory
- ChBE 630 (Summer 2003) Chemical Engineering Unit Operations Laboratory

Of these I have been conferred with the departmental teaching award for both the courses:

- ChBE 760 (Autumn 2004)
- ChBE 630 (Summer 2003)

The summary of the feedback forms is tabulated below:

ChBE Course Number (Quarter/year)	630 (Summer 2003)	630 (Summer 2004)	760 (Autumn 2004)
Students Taught in each course	48	65	53
Ability to Communicate in English	4.73	4.68	4.83
Lecture/Recitation Ability	N/A	4.67	5.00
Timeliness and punctuality in grading	4.63	4.80	5.00
Fairness and accuracy in grading	4.53	4.53	4.92
Office hours availability	4.70	4.61	5.00
Attitude towards helping students	4.80	4.87	5.00
Overall Responsibility	N/A	4.86	5.00
Competence in Engineering Fundamentals	4.90	4.91	5.00
Knowledge of specific course material	4.87	4.89	4.92
Overall Grade/Rating	4.87	4.82	5.00

N/A: not available as department modified the feedback forms from autumn 2003 Scale: 1-5 with 1 being poor and 5 being excellent
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In addition to the quantitative feedback, the students offer descriptive end-of-quarter feedback, which forms a very valuable tool that provides useful suggestions for improving my teaching skills. Furthermore, my extrovert nature made me “the approachable TA”, as one of my students commented: “(Mahesh) was very relaxed, fun to work with and created a comfortable atmosphere to learn”. This helped me obtain **verbal feedback** from a majority of my students on a **daily basis**. This was extremely useful in improving my teaching as the course progressed. The results were very obvious from the unique nature of the ChBE 630 laboratory course evaluations. These course evaluations are conducted, after a student group has completed

each all the lab session requirements (experiments to reports) formalities with a particular teaching associate and move on to the next experiment. I could see my evaluation scores progress as the 5 week summer (term I) progressed and I moved from the 1st to the 16th student group (for both Su-2003 and Su-2004). The data tabulated earlier are the average scores from all the students.

The important feedbacks from all the courses are summarized below. In addition, a majority of these feedback points are **also reiterated in the numerous GATA nomination letters** I received from many students, two faculty members and a TA coordinator.

### **Knowledge, Engineering Fundamentals and Good Course Material**

The courses I taught required comprehensive chemical engineering knowledge and basic fundamentals at all levels. This requires a thorough pre-quarter preparation and constant weekly updates to stay in tune with the requirements of the class. I feel that the best way to learn is to teach and only by having a superior command over a subject one can effectively communicate the subject matter to the students. As most of my students say:

- "Mahesh was very knowledgeable and has a superior command over the fundamentals"
- "Focuses on real life problems....effectively related the link between theory and practice..."
- "Confident ...has good course materials"
- "Analyzes problems from all angles"
- "Successful in relating difficult course material in a comprehensible fashion"
- "Effectively related concepts from textbook to any dynamic project situation"

### **Intellectually Stimulating and Encouraged Thinking**

I feel that the students should be made to think and reason. This augments their problem solving and their analytical reasoning skills. My students realized this quite early and were forced to participate in classroom discussions. If I did not get any response I tried to give vital hints and lead them to the answer. I learned this with experience as some of the students were nervous and shy initially but improved as the course progressed. The confidence they had gained from this exercise was revealed when they tackled the "question and answers" after their group presentations for every course! The students quote:

- "Encouraged students to think themselves so that they understood the concepts and not just get the lab work done"
- "Encourages dynamic and creative thinking"
- "Required us to really learn the material"
- "He is demanding, pushes and stimulates us to figure it out ourselves"
- "Enhanced our problem solving skills to apply our concepts to industry and work"
- "Knows about the pitfalls and gives useful hints"

### **Dedication and Interest for Teaching**

Dedication and passion for teaching is what I had observed in my favorite faculty outside OSU and at OSU (have won the MacQuigg Teaching award). The enthusiasm of a motivated teacher, who is passionate about his/her work, will rub off on the students who turn put in more effort. I have realized that the time commitment is the key and I have tried my best to manage the time and feel that I have improved in that aspect. The students say:

- "Kind of hard to find and wish he was available more but it is understandable as he has more labs than other TAs"
- "Very enthusiastic, available and willing to help students"
- "The effort Mahesh displayed as a teacher was above and beyond"
- "He was always available to answer questions and stayed late nights upto 2 am"
- "Was available on weekends"
- "..showed clear passion for.....in almost 5 years at Ohio State I find rare among...."
- "Love for teaching and interest for his students"
- "He was very concerned and is obvious that he is genuinely interested in chemical engineering and spreading his knowledge to others"
- "Best I have ever had. Dedicated and never ceases to provide help!"

### **Approachable, organized and comfortable learning atmosphere**

The best in a person comes out in a non-stressful relaxed setting where the students have no inhibitions to approach me and hold discussion ranging from specific subject matter, future career options or some personal (life) problems. My motto was "Please help me help you" and it seemed to work very well. Students who have graduated and moved on to industry do stay in touch and drop by in my office when they are on this campus. They say:

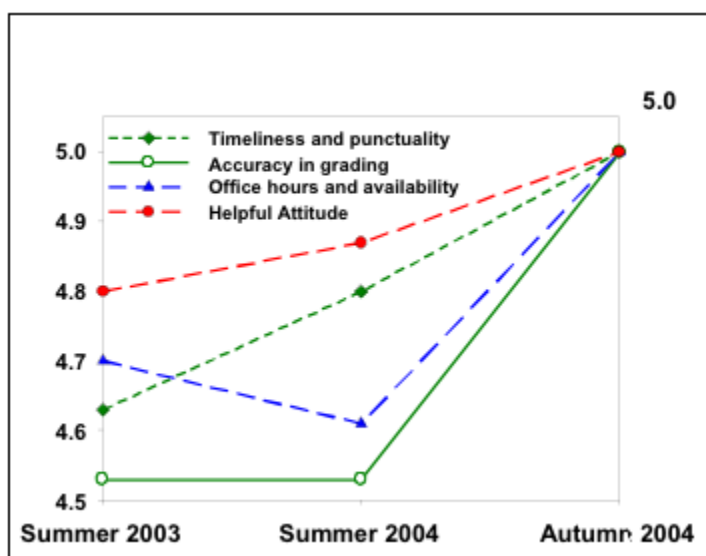
- "It was a pleasure working with you"
- "Great sense of humor"
- "Was relaxed, fun to work with and created a comfortable atmosphere to learn"
- "He was very organized that everything from the beginning to the end flowed wonderfully"
- "Great TA, this is the way all TAs should be"
- "He seemed to enjoy working with students throughout the entire class"
- "Mahesh is organized, well prepared and has an excellent teaching style..."

## **SCOPE FOR IMPROVEMENT**

**ChBE H783** Undergraduate Honors Research (Autumn 2004, Winter, Spring 2005): In addition to classroom (760) and laboratory (630) teaching, I have had a unique experience to serve as a research advisor (mentor) to a Senior ChBE student performing undergraduate level research related to my dissertation topic. This gave me the experience to guide a research student, which is a role most faculties in chemical engineering have to fulfill. I feel this exposure has taught me a lot, but there is a great room for improvement. Project planning; scheduling regular weekly meetings; "being demanding"; and focusing towards the overall research goal need some improvement. While conducting research, unlike classes, specific planning well ahead of time is not exactly feasible leading to ambiguity in the nature of "research work". My primary focus is to adapting to this ambiguity while working with the students and communicating this effectively. In addition, I also aim to incessantly motivate my students especially while dealing with occasional failures (common in research).

**ChBE 760, 630:** Figure 1 summarizes the average scores for my evaluations from the feedback table for classroom courses presented earlier. It is interesting to note that my scores illustrate a progressive increase in many aspects, from summer 2003 to autumn 2004. In the ChBE 760 course (Autumn 2004) I was glad to receive a perfect score "5" for many categories. The area that needed a lot of improvement was severity in grading as the students used to think

that I was “very demanding”, and “a tough grader”. The suggestions were “Needs to be lenient in grading”. After some modifications to my grading styles by being very specific and improving my clarity of communication for report/assignment requirements, the students seemed to be satisfied and my Autumn 2004 evaluation scores for “accuracy in grading” reflect the improvement. I was lucky to have almost the same group of students for ChBE 630 (summer 2004) and subsequently for ChBE 760 (Autumn 2004). The students wished I was “more available” during the summer 2004 course even though I had to put in efforts totaling to **60 hours per week** for 5 weeks. (I did enjoy the work). The primary reason for my “hectic schedule” was that I was overloaded with a total of 16 lab sessions (as opposed to an average of 6-8) as a student says “It was kind of hard to get you at times...but that was understandable as you were doing multiple experiments”. I was able to improve that category by being “always available” in Autumn 2004, for which I had to postpone my “Candidacy Examination” to Winter 2005.



**Figure 1. Trends in average evaluation scores for different categories (1=poor and 5=excellent)**

Finally I would like to conclude by quoting some of my students’ words from my nomination:

“His guidance and strong presence over the last few years has made chemical engineering a stronger program”

“(Mahesh) would push me to try and figure it out myself first.....this was very important because it taught me valuable skills that I will need to utilize once I leave Ohio State and pursue my Chemical Engineering career. In fact I believe that it was this skill of problem solving that helped me get the job at .....(a premier multinational company). They told me that they were very impressed with the ways I analyzed the problems presented to me. I simply followed the methods that Mahesh had taught me in the class.”

“Overall he was very committed to his job and not only became a valuable resource for the class, but also became a friend to the students.”