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Abstract

Suitable training of teaching assistants (TAs) is paramount to the success of any department in every university. TAs who are well trained will be ready and able to handle the wide array of responsibilities assigned to them such as grading, holding office hours, supervising labs and even delivering lectures. The challenge to the university is how to best prepare the TAs for these tasks.

This paper describes an informal, experiential TA training seminar that provides new TAs with instruction from a knowledgeable faculty member paired with an experienced TA. The first part of the paper discusses how the session is designed to equip TA’s with skills and confidence in teaching, working with students in office hours, grading and dealing with a variety of other challenges they are likely to face. The second part outlines how to make the training session active, informal and effective. Pairing a faculty member with a TA is a critical component of the workshop design. Participant evaluations and informal feedback suggest that new TAs are more inclined to ask questions of someone close to their developmental level and at the same time, they appreciate the faculty member’s experience and depth of knowledge.

Introduction

Teaching assistants (TAs) are an important asset in any type of course. They are responsible for most of the day-to-day operations of a class such as grading problem sets and holding office hours. Moreover, these individuals, on average, tend to have the most one-on-one contact with the students due to similarities in age and station. The impact of a TA on a class can be quite substantial, with effective TAs helping to boost general knowledge and performance and ineffective TAs having the potential to discourage and demotivate students. So what is the distinguishing characteristic between a good TA and bad TA? There could be many explanations such as personal responsibility, willingness to help, knowledge of the subject, time management and so on. Although some of these issues are a function of the individual’s personality; other issues can be addressed by proper TA training.

Current TA training methods vary from university to university; but, unfortunately many of these methods employ teaching techniques that are outdated. The best types of training session, like the best classes, use active learning exercises to engage the student and have them ‘learn by doing’. Previous studies have shown that enhancement of a TA training program yields high quality, more effective TAs who are better put to use by the department to increase undergraduate performance and expertise.

Several years ago the College of Engineering at North Carolina State University altered its TA training program to include more hands-on training sessions in order to better provide first semester teaching assistants with these types of skills. One such addition to this training program is the implementation of an experience-based TA training session, entitled “Tips from
the Trenches”. The idea of this session is to pair an established faculty member with an experienced TA to provide the attendees with multiple perspectives on how to be an effective TA, addressing common fears of new TAs and offering tips on overcoming them.

Workshop Design

Common Fears

Being a teaching assistant is hard. It is a daunting task to teach and grade a group of strangers on subject matter that most TAs just recently took themselves. Furthermore, most first-time teaching assistants just started in graduate school and have their own classes and research to worry about in addition to being a TA. The combination of responsibilities and new experiences can result in a very stressful and uncertain environment. As a result, all new TAs have their own concerns about accepting the job, but most of them possess the same fears. We recently polled a group of 41 experienced teaching assistants at 11 different schools from 4 different disciplines about their greatest fear as a new TA.

![Common Fears of Being a TA](image)

**Figure 1:** Common fears reported by 41 teaching assistants from eleven different universities and four different disciplines
The most common concern is ‘not knowing the answer to a question’ which is to say insecurity about knowledge of a subject. Most of the other concerns (other than time commitment) are related to this idea. The best way to overcome this fear is by gaining experience. Some of this experience needs to be gained the hard way, by doing it, but it is our intention to provide these new TAs with some life lessons that we both have learned so that they do not need to make the same mistakes that we did. Our goal for the session attendees is that they take away one or two new ideas to apply to the course they currently TA for, in addition to learning at least one lesson from our stories instead of having to find it out for themselves.

**Overview of Content**

The session is not intended as an all-encompassing guide to TA responsibilities, but a general overview of some of the tasks and challenges that typical TAs experience. Topics covered (Figure 2) include teaching, holding office hours, grading, working with your professor, working in a team of TAs and writing lesson plans.

![Diagram](attachment:image.png)

**Figure 2:** Tips from the Trenches Content Overview
The advantage of having a TA and a faculty member generating the lesson plan is the diversity in perspective and experience they provide. The faculty member has more experience teaching and knows what is required to run a course and what is expected of a teaching assistant throughout the semester. In addition, most faculty members served as a TA in their graduate careers and recall their own experience. This outlook is particularly beneficial in dealing with concepts such as teaching, working with your professor and writing lesson plans. The experienced TA, who just recently finished their first semester as a TA, can provide the new TAs with life lessons learned the hard way. This outlook is especially beneficial in dealing with concepts such as grading, holding office hours and working in a team of TAs. Ultimately, all of the information that we provide in the training session comes from lessons that we have either learned or witnessed first hand.

Teaching

Standing up in front of a group of anywhere from 25-100 students can be intimidating enough without the added pressure of attempting to teach students new, and usually difficult, material. This becomes even more challenging when the TA has doubts in their own mastery of the material. Delivering a lecture encompasses many of the common fears previously mentioned, such as not knowing the answer to a question and a lack of confidence in how to properly explain a concept. The goal of this part of the session is to provide the attendees with an overview of what to expect when giving a lecture (either an informal problem session or a guest lecture for the professor) as well as providing some advice as to how to streamline the teaching process.

- **Problem Session**
  - A good starting place for new TAs to gain experience and confidence due to its informal environment as well as the most common TA teaching assignment
  - Implement active learning techniques
  - Strive to keep class participation high
  - Encourage students to work in groups
  - Don’t be afraid to call on random students to determine class progress
  - Give a ‘stretch break’ for classes longer than 50 minutes
  - Try to learn all the students’ names by the first exam

- **Guest Lecturing**
  - Utilize similar techniques as in problem session
  - Review the lecture material in advance
  - Meet with the instructor to discuss any questions or concerns with the material. For aspiring faculty members, we recommend that they take an active role in the lecture development with the professor
  - Do not be afraid to say “I don’t know” when stumped

- **General Advice**
  - If a TA is nervous about public speaking, try giving a practice lecture to classmates or in front of a mirror
  - Teaching will get easier over time, you just need to get in the game and stick with it
Holding Office Hours

Answering questions about concepts, problem sets or exams during weekly office hours is probably the most common duty of being a teaching assistant as well as being the most interaction that the TA will have with the students. This responsibility is also a source of concern to new TAs due to the time commitment and possible uncertainty of course concepts. As a result, office hours can be either a very positive or negative experience depending on how they are run. As teachers, one of the most rewarding aspects of the job is when a student finally ‘gets’ a difficult concept after minutes (or hours) of work, deliberation and instruction. However, office hours can also be a drain on the instructor when there are fifty students asking questions and only an hour of available time, or when the students are just trying to get the answer instead of trying to solve for it. We focus this part of the session on how to best handle the time issue surrounding office hours as well as how to provide the students with aid and not the answer.

- Set boundaries from the start -- do not hesitate to turn students away when your time is up or when you are ‘off the clock’
- Tell students at the beginning that only aid, and not the answer, will be provided
- How to field questions when a student comes to you with:
  - Nothing on his paper ⇒ Ask simple questions to get him thinking about the problem
  - Everything done but one last part ⇒ Quiz the student on what they have done and what they think the next step should be
  - Ten pages of calculations with the wrong answer ⇒ Nothing. It isn’t the TA’s job to proofread student’s homework
- Avoid helping large groups of students at a whiteboard
- Keep an eye on the solution key to avoid cheating
- Remember what is was like when you were a student coming to a TA’s office hours

Grading

Determining the merit of a student based on homework and exams is a difficult task for new TAs, considering that most of them were on the other side of the desk as little as a year ago. Additionally, it is challenging to streamline the opinions of multiple TAs and the professor on what is correct, what is not and what is the appropriate amount of partial credit. Teaching new TAs about the challenges and subtleties to grading a problem set or an exam requires an additional training session (which is, in fact, offered to new TAs in addition to this session), so we choose to only highlight some key points that we have learned from our own grading experiences.

- Assume the first problem set will take twice as long to grade as expected
- Focus more on what the student did correctly instead of what they did wrong
- Find out the instructor’s preference on partial credit and be consistent with their grading philosophy
- Stay impersonal, be fair and consistent with all the grading
- Generate a rubric for every assignment, noting where and why points were taken off
• Establish a time limit for re-grade requests and require written explanation
• Never write degrading or sarcastic comments to the students on the homework. Instead, stick to positive feedback
• Identify any instances of cheating or other academic integrity violations and report them to the instructor

Working with the Professor

Like any other job, the dynamic between supervisor and worker is complex and can be either a source of angst and frustration or a good, symbiotic, learning experience. Every professor runs their class (and interacts with their TAs) in a different way. Some take a very hands-on approach such as helping out with grading, generating the solution key, holding their own office hour or having weekly meetings to discuss problem session and homework. Other professors have a more of a hands-off mentality and expect the TA to do all the grading, hold office hours and substitute for the instructor at a moments notice. Regardless of their professor’s preferences, the new TA should know what is required of them.

• Meet with the professor at the beginning of the semester to discuss expected requirements
• Do not be afraid to bring up what is expected with regards to these issues
• Make a list of questions and expectations at the beginning of the semester
• Tasks that TAs might be expected to perform: grading, teaching problem session and holding office hours, generating solution keys to problem sets, exam proctoring and substitute lecturing
• Understand the professor’s expectation about desired turnaround time for graded assignments and exams
• For aspiring faculty members, share your ideas about course content, problem sets or exams with the instructor
• If you do start to feel overwhelmed, talk with the professor. If the professor does not address the concerns, talk to the department head or graduate advisor
• The roll of the TA is to aid in the course, not to run it

Working in a Team of TAs

Sometimes in the case of larger courses with multiple sections (~100-150 students), two or three professors and a group of teaching assistants are required to handle the needs of the course. The addition of more TAs is both a gift and curse because it provides more manpower to pick up the responsibilities of the course. More personnel also adds a new dynamic, namely, group work. As engineers we encourage group work, due to its obvious benefits. As every undergrad engineer learns, working in a group can also be very difficult due to the varying personalities and work ethics of the group members. These same challenges extend to working in a team of TAs.

• Delegate course responsibilities equally emphasizing that each team member reserves an equal share of the work
• Assign tasks based on each members strengths
  o TAs who enjoy working with students should handle problem session and office hours
• TAs who want minimal student contact should handle the grading and grade book maintenance
• If a member is not pulling their weight, first try to handle it with the team member; but if that fails, take it to the professor

Writing Lesson Plans

Being responsible for course content is not a common task assigned to most new TAs unless they choose to be involved in the process or they are responsible for material to be used in a recitation section. In a typical discussion section format, the TA just has to generate a few example problems similar to the homework or put together a short review of recent concepts. Sometimes the instructor may ask the TA to deliver a lecture when the instructor will be absent. Writing a lecture is similar to writing a paper, in that everyone has their own style and method to make it work. We approach this subject by describing how we approach the process and highlight some ideas that make it easier for us.

• Make up an outline containing topics such as core concepts, assigned homework problems and theory that has been troubling the class
• Use material from outside sources such as previous lectures, old class notes, material from other faculty members or example problems
• Ask for help from the instructor or a fellow TA
• Learning how to write a good lecture takes time – no one gets it right the first time
• Keep good documentation so future lecturers can utilize the material

Implementation

Running the Session

The running of the TA training session is a combination of the active learning of the classroom and the fireside chats that a family has on a Sunday afternoon. The main objective is to keep an informal, comfortable environment that encourages the active discourse of how to address common TA fears and responsibilities. We go about achieving these ends using the following methods.

• Go around the room and have person share their name, department and which class they TA for
• Briefly highlight the session content and the desired goals of the session
• Use an active learning exercise to facilitate the discussion on TA fears
  o Pair the attendees off in groups of two to four and have them come up with a list of fears they have about being a first semester TA
  o Have the groups share what they came up with and discuss it in the context of Figure 1
• Cover each of the previously detailed six sections using the following strategies
  o PowerPoint slides with the topic name (e.g Teaching) along with a comic, humorous picture or quote
Material from PhD Comics\textsuperscript{8} tends to go over particularly well with the group – this is a very rich source of graduate student humor.

- A relaxed environment where the facilitator highlights issues specific to that topic in the context of advice or personal stories
- Alternate between facilitators based on expertise
  - The faculty member handles such topics as teaching and writing lesson plans
  - The TA addresses issues like holding office hours and working in a team of TAs
- Continually encourage the attendees to speak up and share their own words of wisdom or horror stories

**What the Attendees Take Home**

The ultimate goal of this training session is for the new TAs to have learned something from all of our stories and advice. To qualify what the attendees learned in the session, we end with a final assignment for the entire group that takes about ten minutes to determine the “take-home message”.

- Tell the attendees to write down three things that they learned from the session
- Encourage the group to discuss amongst themselves what they learned from the session
- Go around the room and ask each person to share one thing they have learned and one thing they plan to implement in their course this semester
- Distribute four items for the group to take home
  - Two-page handout summarizing the session content
  - Example problem session outline
  - Excerpt from course notes
  - Example of a TA expectations memo that the faculty member uses in her class

**Feedback**

This type of TA training session was implemented in the fall of 2006 and has been presented a total three times (once per semester) in fall 2006 (22 attendees), spring 2007 (approximately 25 attendees) and fall 2007 (28 attendees). A summary of the attendee evaluations (N=45) from the fall 2006 and fall 2007 sessions regarding session content and overall session effectiveness is shown in Figure 3.
All of the students in 2006 and at least 80% of the students in 2007 rank the session as either good or excellent. Additionally, at least 85% in 2006 and 70% in 2007 either agree or strongly agree that the session was enjoyable and beneficial to them (the highest rating of all other TA training sessions at North Carolina State University). According to the attendees, the benefits of the session included: ideas/insights/tips/practical advice for being a good TA, real examples and experiences, lively interaction, having an experienced TA as a presenter, informal manner and
effectiveness of the presenters. The general impression we received from the surveys as well as correspondence with the attendees themselves is that having an informal session that highlights common issues and how to handle them is what the students are looking for. The greatest complaint amongst the students was the time and date of the session itself (a Friday afternoon from 3:30 – 5 pm in late September). Most of the students would prefer a date earlier in the semester so they can put the information to use earlier (classes begin in mid-August) as well as a time that, well, is not on a Friday afternoon. We plan to address both of these concerns in future session along with continually updating and enhancing the session content to best suit the new crop of TAs that arrive each semester.

Conclusion

Here we have introduced a type of training session that utilizes the wisdom of a knowledgeable faculty member along with the first hand insights of an experienced TA to provide new teaching assistants with some ‘tips from the trenches’. We designed the content for the session by addressing common fears that new TAs face and then tailoring the session to combat these issues. Employing first hand experience and anecdotal references, we address six general TA responsibilities: teaching, holding office hours, grading, working with the professor, working in a team of TAs and writing lesson plans. We then illustrated how conducted the session and how the focus was to maintain an informal, friendly environment while using active learning techniques to maximize the uptake of the advice on the students. We confirmed from both survey results as well as a final session assignment that the experience-based method is most successful in addressing common TA fears as well as providing TAs with practical strategies to enhance their effectiveness.

References