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Reflective Essay for Leadership Experience

Engineering Education Teaching Assistant (TA)

**Part 1**

The teaching assistant (TA) experience, for me, involved being the co-leader of two freshman engineering course recitations: one section of Engineering Models I (ENED1090) and one section of Engineering Foundations (ENED1020). Each course met once a week for recitation to complete a new lab assignment or group assignment. For Engineering Models, I worked with the same table of approximately ten students weekly. Likewise, for Engineering Foundations, I worked with the same room of eighteen students weekly. For the Foundations recitation, I shared responsibility with one other teaching assistant in the room.

For both courses, I had many responsibilities as the teaching assistant. Primarily I was to supervise students to ensure successful completion of the assignments. In doing so, various roles and duties entailed, such as providing extra guidance on the assignments when the lab instructions were not sufficient. This also involved helping students troubleshoot and solve problems they encountered. This involved encouraging and assisting students in becoming more adept at working in teams and working with their peers to best utilize their resources and intelligence. Finally, I was also a source for students to approach regarding general questions and concerns they had regarding engineering, scheduling, co-ops, etc.

The most significant part of this experience, for me, was the opportunity to develop relationships with underclassmen students and provide a positive first experience in their engineering endeavors. In addition to building relationships with the students (to be described), it became apparent to me who was blossoming in the engineering field and who was struggling. With this realization, I was able to tailor my interactions with each student accordingly to either continue their successful start in engineering or to assist them in learning how to be successful in their engineering education and future courses. For all students, I ensured a positive experience by conveying enthusiasm for the course material, the curriculum, and the field of engineering. I constantly reminded myself to have a positive attitude due to my interactions with teaching assistants my first year, who did not appear to want to ever be there. Their attitudes made it difficult to interact with them, to understand from a student’s perspective the reasons for the assignments/classes, and to be personally motivated to even be in recitation.

This experience met my expectation of the quality of interaction I would have with the students. In working with the same students weekly, I expected that I would develop relationships with many of the students and I believe this was accomplished. As the semester passed, I noticed the students approaching me with fewer questions regarding the course material and with more questions regarding topics such as scheduling, co-op, my experiences, etc. Quality of interaction with the students was one of my key goals of this experience, as well as to share my knowledge and insights that I have gained through my personal experiences. Many times students asked about my co-op experiences and courses I have taken, which gave me the opportunity to happily show them my work and explain the field of interest I am pursuing. There are not any noteworthy reasons or ways this experience did not meet my expectations.

The first leadership learning outcome identified in the proposal for this experience was the ability to relate, communicate, and work effectively with peers. Because of this experience, I have greatly expanded my communication skills and ability to alter directions and explanations to tailor to different students’ needs. I am able to take a concept and explain it in multiple ways in order to facilitate a variety of students’ learning. This was especially prevalent in the Engineering Models course and trying to help students understand Matlab programming. For some students, verbal explanations or suggestions were sufficient for them to understand how to proceed on their assignments. For others, I could work with them to establish a flow chart of the basic steps they needed to code to accomplish the goal of the assignment. And finally for others, I often needed to sit and do basic examples of different coding techniques or commands so they understood how to use it or what was being done. In retrospect, I better understand the four levels to programming skill development cited in “On the cognitive effects of learning computer programming” (cited in proposal for this experience). Furthermore, it was evident as the semester progressed, some students were progressing towards higher levels (3 and 4) much quicker than other students.

The second learning outcome was identifying the various characteristics of a leader in a given role or situation. As previously mentioned, I consciously made sure each week to have a positive attitude. Often the students had negative, pessimistic attitudes about being in class, about the assignments, etc. Thus, it was essential that I, as the leader and role-model figure for the students, have a positive attitude. On several occasions I noticed a change in the atmosphere once the students started working, collaborating with peers, and outside distractions were minimized. As a leader, I reinforced this behavior by recognizing good teamwork and collaborations as well as noting when students were improving their attitudes. Especially for the Engineering Foundations course, teamwork is essential to completing the lab assignments. At the beginning of the semester it was apparent that many students had little experience in effectively working with their peers. With this realization I made a point to discuss with students effective teamwork strategies, communication skills with others, and how to efficiently use their time in class. By the end of the semester, the students’ interactions with each other were completely different and the teamwork was much more cohesive. Seeing this progress reinforced my self-confidence in my leadership abilities to help these students transition in this setting.

**Part 2**

In this experiential leadership learning project, I relied on information I acquired in a course I have previously taken, entitled Effectiveness in Technical Organizations. This course had a unit dedicated to leadership. A specific concept I utilized in this project is the Hersey-Blanchard Situational Leadership Theory, which states that one’s leadership style should change depending on the maturity level of subordinates. Other leadership styles were also considered for this experience, such as Lewin’s leadership styles (autocratic, democratic, laissez-faire). The knowledge of different leadership styles greatly influenced and contributed to my learning throughout this project. This was the first opportunity to apply these theories I learned in a practical environment. Because of the students’ different levels of understanding and learning speeds, I was able to specifically apply the Hersey-Blanchard model, especially with my Engineering Models students. The more mature students, those who better understand how to code Matlab programs, did not require as direct responses to their questions as those who did not understand Matlab as well. With the more mature students, I was able to give more indirect responses to their questions, often which led to them answering the own question or solving their own mistake. This leadership style fostered better learning and room for individual growth for the student than if I were to always be hands-on. For the Engineering Foundations course, the democratic leadership style seemed most appropriate to utilize with the students. This was accomplished by providing general guidance and direction on how to complete the experiments, but also allowed for students to develop their critical thinking skills and engineering-problem solving skills to complete the assignments. Development of these skills is one of the main goals of the ENED1020 course, thus it was appropriate to use this leadership style as a TA.

 Multiples communications styles were needed to best reach the students. This included verbal and visual communication. Explicit instructions or answers were sufficient for communicating with some individual students, whereas to effectively communicate an idea to other students, creating a visual aid or reference was necessary. Flow charts, visual diagrams, or written examples are examples of the visual communication methods I used throughout the semester. I frequently used flow charts in the Engineering Models to help students understand the steps they would need to incorporate to reach the goal output of their code. After understanding the steps of the process, many students needed no further assistance in completing the assignment. Visual diagrams were especially helpful in Engineering Foundations for various experiments, such as the electric circuit lab. By drawing equivalent diagrams on the walls, the students could better apply what they were learning from lecture to the lab environment. Written examples were the most common form of visual communication that I utilized in both courses, to demonstrate the use of an equation, or of a new Matlab command, or even of a general idea. The visual communication methods were almost always received better by a greater proportion of the students than verbal communication alone. When interacting with fellow TAs, verbal communication was of a more complex nature and more technical than when communicating with the students. This is due to the other TAs having equivalent knowledge of the material as myself, so our conversations were able to have a significantly greater depth. Similarly, conversations with the professors were at a much higher technical level than the students. With TAs and professors, for example, we could discuss different ways to approach an experiment or assignment, different methods of Matlab coding to achieve the goal, or reasons experiments were yielding faulty results. Although many of these conversations could be had with students, with TAs or professors the jargon was very different than with students, due to the difference in knowledge between the constituents.

**Part 3**

 Although I do not have specific intentions or plans to pursue teaching in the future, this experience and what I learned still has several applications. For example, when in a future mentoring or managerial position, both improved communication skills and the ability to identify individuals’ learning progression will have implications. Additionally, the importance of visual communication methods highly relevant and key to future leadership situations, where it will be essential to incorporate relevant visual aids to most effectively communicate with the desired audience. Even in non-leadership situations this realization will be essential, for almost any profession giving a presentation is required.

 This experience provided the first opportunity to directly apply the leadership styles I learned in a previous course. It gave me a chance to see how to implement various leadership styles with individuals of different backgrounds, educational levels, and learning abilities. This experience will be useful when other leadership opportunities arise and I again find myself applying the principles I learned. Additionally, what I learned from this experience can be applied in situations when I may not be the leader, but rather the subordinate. I can empathize when a leader is attempting to find ways to best unite a group of different people or trying to best communicate with a group of individuals. As this experience taught me to have patients with my students, I will now be able to have more patience with those leading me.

 Various opportunities arose throughout the semester to disseminate my work. At the Honors Program CEAS Reception dinner in September I spoke to a group, mainly composed of freshman students and faculty members, about my experience (thus far at the time) about the TA experience as well as how to propose the experience. Furthermore, I communicated with the Honors students with whom I worked in the recitations about the opportunity to complete an Honors requirement using a TA position. Having the opportunity to share with these young students this opportunity helped establish excitement about the Honors program for both myself, as well as for the students. Finally, I met with Dr. Kastner at the end of the semester to review my experience, reflections, and learnings from the experience. In the spring semester an engineering education conference is to be held at UC, for which I will assist in the preparation of a poster presentation about the TA experience.