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Teaching Soft Skills to Secondary Students Through Internships

Kristina Rigden

Director of Outreach Programs and Women in Engineering, College of Engineering, California State Polytechnic University, Pomona, USA

Email address:
karigden@cpp.edu

Abstract: Internships are important for secondary students so they may develop academic, social, and decision-making skills that will be applicable in the real world. Secondary students acquire internships in the summer with organizations or universities, but the learning outcomes are unclear. This qualitative study determined if secondary student interns develop academic and social growth through a two-week summer engineering internship. This internship required secondary students to work as classroom assistants with teachers learning engineering curricula to teach to K-12 students. The secondary students assisted in the classroom with CAD drawing, programming and constructing robotics and animatronics. The objective of the student intern program was to give these interns an authentic experience on a college campus with the necessary tools and skills, so that these students will choose to attend university and major in an engineering field. Within the internship, daily one-hour workshops took place with a focus on developing soft skills. The workshops ranged from intern roles, professional communication, interview process and skills, how to write a resume, how to apply for college, financial aid and scholarships, and college experience. The results from this study show students do develop soft skills, such as communication and public speaking, new knowledge gained, and confidence through the internship learning environment.

Keywords: Soft Skills, Secondary Students, Internships

1. Introduction

Project Lead The Way (PLTW) is a non-profit organization that partners with public schools, charter schools, magnet schools, organizations in the private sector, and higher education institutions to increase the number and quality of Science Technology Engineering Mathematics (STEM)-ready students graduating from the educational system. In 2018, 14,072 elementary, middle, and high schools were implementing the PLTW curricula [1].

In the state of California, there are over 1,000 schools that are using PLTW curricula. In southern California, over 50,000 K-12 students are taking PLTW courses each year. This results in 39% of engineering first time freshman at California State Polytechnic University, Pomona (Cal Poly Pomona) that are from PLTW schools.

During the summer at Cal Poly Pomona, the College of Engineering hosts PLTW summer core training, (as of summer 2019, Cal Poly Pomona no longer serves as a University Affiliate for PLTW as their financial and logistical model for delivering core training has changed) where K-12 educators come to campus to be trained on PLTW curricula. During this training, the College of Engineering hires secondary students as interns to help in the classroom for two weeks. The interns help the K-12 educators with certain aspects of the curriculum that they have experience with, such as programming, CAD drawing, and constructing the robotics and animatronics. In addition to helping in the classroom, interns also attend soft skill workshops. Student interns have been utilized in summer core training since 2012, but a study has never been completed about the student intern program. The objective of the student intern program is to give these interns an authentic experience on a college campus so these students will choose to attend university and major in a STEM (Science, Technology,

Engineering, Math) related field. With the several components involved in the student internship program, this study will examine the student interns' academic and social growth through the soft skill workshops conducted by the intern coordinator.

Real world experience through internships is important so adolescents may explore aspects of themselves to develop social and decision making skills [2]. It is important to identify positive, negative and neutral factors in the student internships since "…little is known of the impact of an internship with regard to students' perceived communication, critical thinking, and leadership skills…" [3]. There is a "…lack of empirical research on the effective implementation of internships" and few studies have been conducted that analyze internships for middle school and high school students that focus on students and other key participants [4-5]. This leads to the qualitative research question for this study:

Do soft skill workshops help secondary students develop their academic and social growth in a two-week summer internship environment?

This research question enabled the participation of the student interns and intern coordinator. The student interns were recommended to Cal Poly Pomona by their teacher, and then the students completed an application. A blind-review process chose six interns by faculty and staff at the College of Engineering. The intern coordinator was an undergraduate engineering student employed by the College of Engineering as a Student Assistant for the Office of Outreach. The intern coordinator was a junior in college and has had internship experience in high school and college. The intern coordinator worked with the Outreach Liaison to set a two-week intern schedule with a range of workshop ideas. The ideas were then developed into one-hour presentations with a PowerPoint, activities, and classwork and homework assignments. The intern coordinator and Outreach Liaison finalized the presentations and the schedule for the student interns. The student interns worked with the intern coordinator for a one-hour workshop in the morning and afternoon for two weeks Monday – Friday and the following are the ten workshops listed in order: 1) intern roles and how to communicate professionally, 2) how to write a resume, 3) personal statement, 4) mock college application, 5) financial aid and scholarships, 6) elevator speech, 7) interview process and mock interview, 8) how to study, 9) college experience, and 10) how to choose a major. When the student interns were not in their workshops, they were in the PLTW classroom assisting the educators with the curriculum. This study about secondary students will add to the body of research about student internships with a focus on soft skills workshops [2-3].

Conceptual Framework: Presented in Figure 1 is the conceptual framework, which builds on the concepts and supports and informs the research. This framework builds on the different concepts presented to strengthen the study and inform the research question.
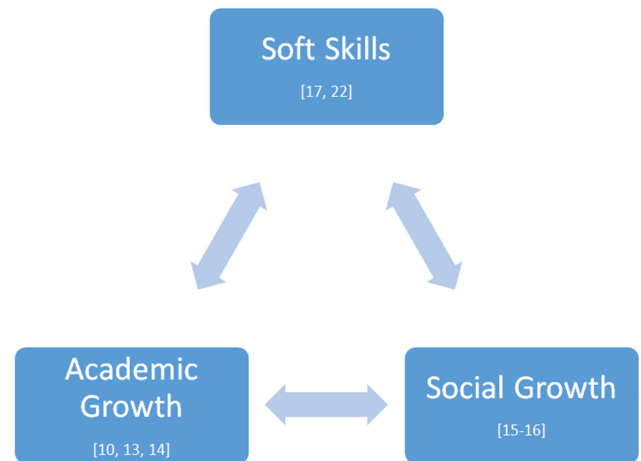

Figure 1. Conceptual framework.

2. Materials and Methods

The researcher used qualitative methodology, which enabled comprehensive data to be collected. A qualitative approach honored the voices and multiple perspectives of participants [6]. This case study utilized observations, interviews, and document collection with the sample population in order to answer the research question.

For this qualitative research study, several pieces of data were collected. First, observations occurred in the workshops. The observations consisted of a firsthand encounter. Next, an audio-recorded interview took place with the student interns and the intern coordinator about soft skills, and academic and social growth. The interview helped gather the student intern's thoughts and opinions of the internship and internship environment, which cannot be directly observed in a classroom or workshop setting [7]. Lastly, document collection of the student's classwork and homework assignments were collected.

2.1. Sample and Participants

Table 1. Participants for the study.

Student Intern Participants	Intern Course	Age
Cora	Automation and Robotics	16
Kate	Automation and Robotics	14
Adam	Design and Modeling	17
Sam	Design and Modeling	14
Amy	Principles of Engineering	16
Eve	Principles of Engineering	16
Intern Coordinator Participant	Major	Age
Bella	Mechanical Engineering	20

The setting for this study was Cal Poly Pomona College of Engineering during PLTW summer core training. The participants for this study were the student interns and the intern coordinator, as shown in Table 1. There were six student interns, two in each course, who were interning with the following middle school and high school PLTW courses: Automation and Robotics, Design and Modeling, and Principles of Engineering. The intern coordinator was an undergraduate engineering student at Cal Poly Pomona College of Engineering, a junior standing, and previous

internship experience in high school and college. The intern coordinator identified as Hispanic/Latino and the interns identified as 66% Hispanic/Latino, 17% Asian American, 9% Pacific Islander and 8% African American. Pseudonyms were used for the student interns and the intern coordinator.

2.2. Data Collection and Instruments/Protocol

The research study was comprised of observations, interviews, and document collection to answer the research question. Observations were used during the study to help answer the research question. The researcher conducted three one-hour long observations in the classroom when the student interns were in their workshop with the intern coordinator. Observations were conducted on day four in the afternoon, day five in the morning, and day seven in the afternoon. Observations gave the researcher a firsthand account of the actions that took place in the workshops. The observations took place before the interview and document collection so no behaviors would change during the study. The researcher observed the participants and made notes on soft skills, academic, and social growth for the study. These notes aligned with the conceptual framework.

Audio-recorded and transcribed interviews took place individually with each participant during the study on day eight in the afternoon. The interviews were conducted face-to-face and lasted 15 to 37 minutes. Some of the interns thoroughly explained their answers to the interview questions and the other interns gave very short responses, which is why there is a range of time for the interviews conducted. After the interview, the researcher transcribed the audio-recorded interview. The interviews took place after the observations so the participants' interaction with each other would not change the outcome of the study. The researcher conducted verbal member checks face-to-face and individually with all participants on day ten of the internship experience.

Submission of documents consisted of the student's classwork and homework assignments. The intern coordinator submitted the assignments to the researcher. Since there was no protocol for document collection and analysis, the conceptual framework with elements of soft skills and 21st century learning skills guided the analysis. These documents were used as triangulation.

3. Data Analysis

During analysis of the data, the researcher used the conceptual framework and a case study method to analyze the interviews and observations through rich description [7]. The researcher printed out the interview transcripts and observation data and collected the classwork and homework assignments, and circled all of the words or phrases that reappeared multiple times or vocabulary that was relevant to soft skills, academic, and social growth. The circled words were then typed into an excel document to reference the 165 open codes. After open coding, the researcher moved onto the axial codes, which became the major themes of the study. From the 24 axial codes shown in Table 2, similar codes were combined to result in three selective codes, which are where the propositions or hypotheses are formed [7].

Table 2. Axial Coding.

Axial Code	Definition	Selective Code
1. Soft Skills Example	Examples presented by students: handshake; eye contact; mannerisms	
2. Everyday Skills	Student definition of soft skills	
3. PowerPoints	Students liked the PowerPoints presented during the workshops and were given copies of all PowerPoints on Google Drive	
4. Studying	How to study; applications and websites to use; tips and tricks	1. Soft skills gained through participation in the intern workshops
5. Resume	Students deem this relevant information	
6. Mock Job Interview Workshop	Students learn about interviewing skills and practice interviewing with each other	
7. Clear Directions	Intern coordinator making eye contact with students; telling students process and where to sit for mock interview	
8. Engagement	Students asking intern coordinator questions during workshops; intern coordinator getting feedback from students	
9. Student-Driven Mock Interviews	No intern coordinator interaction with students during mock interview	
10. Elevator Pitch	In interviews, students said this is their favorite workshop	
11. Academic Growth	Definition presented by students	
12. Workshops	Topic of workshops	
13. College Application Workshop	Intern coordinator presenting workshop on how to apply to UC, CSU and private school; picking a college/university	
14. Choosing a Major Workshop	Intern coordinator presenting workshop to students and had students take quizzes to determine which major would be best	2. Knowledge
15. Intern Coordinator Helping Students	Giving students tips on picking colleges/universities and majors	
16. Personal Statement Workshop	Students learn how to write personal statement and get feedback from intern coordinator	
17. No Clear Directions	Students do not know what they are supposed to be doing in workshop	
18. Unknowledgeable	Intern coordinator does not know answer to student questions	
19. Financial Aid and Scholarships Workshop	Intern coordinator show students how to apply for these opportunities	
20. Clarification	Needed on directions	
21. Social Growth	Definition presented by students	
22. Communication	Information given to the students in the workshops; students mention internship environment and comfortable atmosphere	3. Confidence in Communication
23. Connections	Students making connections with each other, staff and K-12 teachers	
24. Classroom Environment	Friendly; everybody warm and vibrant	

3.1. Credibility and Trustworthiness

Triangulation helped with credibility through the interview transcripts, observations, and classwork and homework assignments. In addition, the researcher participated in member checks. Verbal member checks face-to-face enabled feedback from the participants in the study to gain their insight to see if all of the data was captured accurately [8].

3.2. Ethics

All participants in the study signed an informed consent form that addressed the details of the study. The researcher explained the purpose of the study and promised the participants that their interview responses would remain confidential. The Institutional Review Board (IRB-18-37) approved this study. The researcher coded the responses under a pseudonym and kept the forms on a password-protected computer.

4. Results

The purpose of this study was to determine if soft skill workshops help secondary students develop their academic and social growth in a summer internship environment. The data collected from this study addressed the following research question: Do soft skill workshops help secondary students develop their academic and social growth in a two-week summer internship environment?

4.1. Analysis of the Findings

In this analysis, the researcher addressed if the soft skill workshops helped secondary students develop their academic and social growth in a two-week summer internship environment. The three selective codes from the codebook analysis will be presented: soft skills, knowledge and confidence in communication.

4.2. Soft Skills

In this study, soft skills are defined as social emotional intelligence, social emotional learning, and professional skills [9]. The participants in the study defined soft skills as skills that have to do with people. For example, have a proper and firm handshake; feel comfortable with public speaking; make eye contact when you are speaking with someone; and communicating efficiently through speaking, presenting, email and writing.

The soft skills gained through participation in the intern workshops consisted of how to study; how to write a resume; how to write and practice an elevator speech; and the interview process for internships, universities, or future jobs. The study skills workshop covered how to study; find a study environment; make a study schedule; eliminate distractions while studying; the importance of food and break time while studying; and study applications that can help improve study skills. Bella, the intern coordinator, presented all of this

information. This specific workshop touched upon academic behaviors classified by Snipes and Tran such as paying attention, participating in class, and studying [10].

During the study skills workshop, Sam commented that he does not "…have good study habits. I wait until the last minute and cram everything which I know I shouldn't do and I should stop doing, but it's just something I got used to, which I am going to stop doing." After the study skills workshop, Adam said his academic growth was expanded because he learned how to use his time efficiently when studying; how it is important to have a study zone with good lighting that is not the couch or the bed; how to block out the noise or go into a noisy room depending on study habits; take breaks while studying; and eat healthy food instead of junk food.

Bella conducted a resume workshop by using a PowerPoint with resume templates and examples. In this workshop, students had time to work on their resumes and Bella was able to review them and give them tips to improve their resume [11]. This feedback was very valuable to Amy and Cora. Amy commented that she enjoyed the resume workshop and this was Cora's favorite workshop because she remarked that she will need a resume soon to apply for jobs.

Lastly, Bella conducted a workshop about the interview process for internships, universities, or future jobs. The topics in this workshop were the purpose of an interview, how to prepare for an interview, common interview questions, and maintaining conversational flow. After the presentation part of the workshop, Bella gave students five common interview questions in preparation of the mock interview activity. After students felt prepared, Bella put the students into pairs and they took turns interviewing each other, to resemble a mock interview. Hirsch deems mock interviews an important process to teach students so they can become hirable [12].

Eve felt the mock interview workshop helped improve her soft skills by knowing how to impress an interviewer and knowing what not to say during an interview. With the mock interview, Amy felt she took the opportunity to practice her interviewing skills. Adam appreciated the mock interview since he has a college admissions interview scheduled with a private college in the next few months. After this workshop, he felt better prepared for his college admissions interview.

4.3. Knowledge

Knowledge encompasses academic growth, which is defined as acknowledging academic competency, academic mindsets and how student's knowledge grows and changes over time [10, 13, 14]. Participants in the study defined academic growth as learning writing or mathematic skills; learning and gaining knowledge; applying knowledge to different life scenarios; and working in a classroom with people.

Both Bella and Kate remarked that academic growth is gaining more knowledge of your learning and learning something new each day. They described academic growth as a person's knowledge that continues to grow from the first day to the last day. In this context, both were referring to the first

day of the two-week internship and the last day of the internship. This definition is similar to Anderman's definition of academic growth as student knowledge that grows and changes over time [14].

In the observations and interviews, a common theme of new knowledge emerged. The common theme was the college experience.

College experience

The new knowledge gained as a result of the workshops on college experience consisted of how to apply to college; how to write a personal statement; how to choose a major; and financial aid and scholarships. Participants attended a workshop on how to apply to campuses at the University of California (UC) campuses, the California State University system, and private universities. During this workshop, Bella explained that it is important to not only look at the ranking of the university, but also the size, location, and cost to attend this school. Many participants remarked that they had never considered how to evaluate their university choices and that this information was very helpful. Adam commented that he now knows how to apply to college after attending this workshop and found it very helpful since he is starting his senior year of high school and will be applying to colleges in the next few months.

This college experience workshop also examined how to write a personal statement for the UCs or private universities. In the workshop, Bella explained that "a personal statement is your story and what is important about you" and it shows "…how far you have come since you are finishing up high school." Bella instructed the students to write about what they have learned, any challenges they have experienced, and to write in their own voice without using slang.

The homework for this workshop was to write a personal statement and Bella commented that she received emails from four of the six students asking to clarify the homework and provide a more detailed example of a personal statement if one was available. Bella put some handouts together with the help of the Outreach Liaison and gave the handouts of the template, outline and example personal statement to the students. Bella also gave students an extension on the due date of the personal statement so they could review the handouts and write their personal statement. After the help of the Outreach Liaison, Bella commented that all six student's personal statements vastly improved from his/her first draft. This example illustrates the importance of supervisor support from the Outreach Liaison to Bella and Bella to the students [2]. The Outreach Liaison was able to support Bella in providing material for the workshops, which in turn led to Bella supporting the student's academic growth with workshop content.

Three students had positive points to discuss regarding the personal statement workshop. Cora commented that she liked the personal statement workshop since it was nice to "…get an idea of what I'll be doing when I apply to these colleges and stuff, so I thought that was really cool." Kate and Eve remarked that the personal statement workshop was their favorite. Kate stated that the template, outline and example provided of the personal statement was helpful since she was able to see an example of what a personal statement looked like. Eve said she was going into her junior year of high school and she was appreciative of everything she learned.

Another workshop was how to choose a major in college. Bella provided students with three different online quizzes[1] to determine the best major for them and all six students received engineering as their end result of the quiz. Since many of the students were PLTW students and interested in majoring in engineering, Bella was able to bring in Cal Poly Pomona engineering undergraduate students to talk to the students about the different types of engineering majors. During this workshop, Amy commented that "choosing a major and talking about different engineering majors really helped me figure out what I'm trying to do." The students remarked that hearing university students discuss their different engineering majors was beneficial for them.

The last workshop as part of the college experience was financial aid and scholarships. This workshop introduced students to different types of aid, the FAFSA (Free Application for Federal Student Aid), and how and where to find scholarships. This was Sam's favorite workshop because he felt it was the most important. He knew he was going to apply for financial aid and scholarships, but never knew how to apply for them and this workshop taught him how to apply for financial aid and where to find scholarships. Amy commented how important scholarships are in college. As Amy will be entering her senior year of high school, she had been researching FAFSA, Cal Grants and the National Merit Scholarship Program, but never knew how to apply. Adam's favorite workshop was the financial aid and scholarship workshop because he knew the least about this topic. He stated now he knows what FAFSA is, how to find scholarships, and the difference between unsubsidized and subsidized loans.

The knowledge gained from these college experience workshops helped students with their academic growth. Many of the students explained how excited they are to apply to college and now know what the application process requires. Adam and Amy are applying to college in the next few months and they expressed their gratitude that somebody would sit them down and explain how to do everything. Adam was especially grateful since he is a first-generation college student and his parents did not know how to help him with the college application process.

The workshops of how to study, how to write a resume, and the interview process were helpful to students in developing their soft skills which led to academic growth. Students remarked that they wanted to improve their study habits and now they knew how after the workshop. Students experienced academic growth with new knowledge of the college experience.

4.4. Confidence in Communication

Confidence in communication encompasses the social

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1 The Ultimate Career and College Major Quiz for High School Students from Connections Academy based on the Holland Code; Major Quiz from Loyola University Chicago; and What Kind of Engineer, Scientist or Tech Professional Should I be from STEM Study

growth that the students felt they experienced during this internship. Social growth is recognized as human intelligence, successful intelligence, practical intelligence, moral intelligence, social intelligence, and emotional intelligence [15, 16]. Students defined social growth as being able to grow and widen their experience of society; how to interact with professionals in a work or school setting; getting out of your comfort zone so you can get more opportunities; socialization and communication; looking someone in the eye when you are speaking with them; and making connections.

Within the realm of communication, many students mentioned it is a great skill to have. Eve explained that the communication skills she learned would be applicable to future internships. Sam commented that he liked the way Bella presented communication skills intertwined within all the workshops because it showed him how to properly speak to someone without being disrespectful. This opportunity to learn communication skills is a necessary 21st century learning skill that will enable students to be successful in future endeavors [17].

Internships are important for secondary students so that they develop social skills [2]. Adam described social skills as a form of communication, which enables people to talk and interact with one another, have conflict resolution skills, be able to explain your ideas to another person, and collaboration [16]. Adam explained that strong written communication skills are also important because he learned from Bella that writing is not the same as talking. When writing, the correct tone and voice need to be represented in an email or paper, so the communication to the reader is clear.

Cora remarked that she recently took a communications class at a local school and she was able to apply what she learned in that class during this internship. She was able to work with the other interns, take on a leadership role in the classroom and collaborate since she realized that not all people can do things by themselves [18]. At the end of the two-week internship, Cora stated "I feel like I grew [in the workshops], just being able to talk to people and not be as, not necessarily shy, but more confident when I'm speaking to people and being more comfortable stepping out of my comfort zone." Amy mentioned that when she was in the PLTW training classroom with the teachers, she was able to step out of her comfort zone and talk to the teachers to see if they needed help.

Kate explained that on the first day of the internship, she is "…a very shy person and I don't like talking to anybody else, so when I got here and got put in a room with people I didn't know that were already talking, it sort of told me I'm going to have to start talking soon and it put me out of my comfort zone and I started talking to people that I hadn't known before." This growth is evident in her comparison at the end of the internship. She commented that with the information she learned in the workshops and by doing a few presentations in the workshops over the two-week period, she felt the confidence she gained will enable her to speak to a future teacher or professor to write her a recommendation letter.

Bella observed that the students were more comfortable doing their presentations the second week of the internship. She could see the evidence of student's presentation skills improve from the first week. This newfound confidence in the students was also witnessed in the Ronczkowski study on post-secondary students as interns [11]. Gaining confidence was not an outcome expected in this study, but it was evident from the interviews and observations conducted.

All of this confidence in communicating and communication skills also led to connections among the interns and PLTW teachers. For example, Amy said that one of the PLTW teachers could get her an internship in his engineering company he used to work for and Amy was so happy to have this connection. Eve and Cora said the internship was a great opportunity to meet people and make connections. In the interview with Cora, she did mention that she had the same partner for every single activity over the two-weeks and she wished Bella would have had the students switch partners for some of the activities. Switching partners for some of the activities could have led to a more welcoming and congenial environment since the six students would have the opportunity to mingle with each other in the short two-week period [5].

5. Discussion

The soft skill workshops helped the students improve their knowledge and gave them confidence in communicating with the people in the internship environment. The knowledge of the college experience with how to apply to college, how to write a personal statement, how to choose a major, and financial aid and scholarships was very valuable to the students, as evidenced in the interviews. The confidence in communication demonstrated student's social growth throughout the two weeks. These soft skill workshops did result in academic and social growth of the students.

5.1. Implications for Practice

The results of this study can inform the future workshops of the PLTW secondary student intern program. For example, during the workshop activities, there needs to be an opportunity for students to pick their partner and for the intern coordinator to assign partners. Different pairing can allow for a more welcoming and congenial environment [19].

The handouts provided by Bella were very beneficial for the students. Two students commented that the template, outline and example provided of the personal statement were very helpful in understanding the content. The resume template and example were valuable to students so they could successfully write a resume and complete the task. By providing additional material for the students and modeling the requirements of the assignment, this enabled scaffolding so students could grow academically and feel confident in their subject matter knowledge [20-21].

Lastly, feedback is necessary when interacting with secondary students. Students appreciated the feedback that Bella gave them on their resume because it led to learning and reflecting on their resume [5]. For future workshops, feedback

should be given on all other assignments, including the personal statement and mock interview.

5.2. Recommendations for Future Research

In this study, there were seven participants (six interns and one intern coordinator) who had engineering experience. Additional research would need to be conducted with a larger population of secondary students, and in another discipline. For further research, a quantitative approach could be used with a survey for the participants.

Since many of these interns were presidents for their high school club, whether robotics or engineering or 3-D printing club, they want more workshops tailored to their leadership position so they can bring that knowledge back to their high school club. One student recommended to add workshops about project management, how to talk to people from a leadership position, and presentation skills. The leadership component is a quality that Al Abduwani and the Dale Carnegie Training Institute deem important in social growth and developing soft skills [18, 22]. Leadership qualities need to be taught to students and this should be a future workshop or be intertwined with a communication workshop so students can grow into leadership positions at their secondary school.

6. Conclusion

This study examined soft skill workshops held during a two-week summer internship. The outcomes of the interns during this internship were development of soft skills, increased knowledge and academic growth, and confidence in communication as evidenced by social growth. Soft skill development was evident when the participants learned about soft skills and applied those skills to their academic and social life. Student's knowledge increased about the college experience during the workshops. Student's social skills increased by learning how to communicate with a variety of audiences. From this study, the suggestions are to plan the workshops so there will be scaffolding, modeling and feedback given to the interns by the intern coordinator. Recommendations for further study include research on a larger sample size and a different discipline for the internship.

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