Planting the Seed:
A Workshop for Students to Explore Environmental Careers

Senior Project Written Report

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Abstract

With climate change being among the biggest problems humanity faces, it is essential that youth are encouraged to pursue careers to combat it. In this project, I conduct a workshop that allows students to explore environmental careers. The workshops were conducted at a local high school to students ranging from freshman to senior status and included information about the range of environmental careers, majors in the College of the Environment at UW, an activity which allowed students to brainstorm the range of careers, and a discussion about what skills and experiences are useful to pursue those careers. After conducting the workshops, I found that students are more interested in pursuing an environmental career and more knowledgeable about the skills and experiences that will prepare them for one. Increasing an interest in students to pursue a career in the environmental field is valuable because fighting climate change is a complex task that requires the efforts, skills and knowledge of as many people as possible.

Product, Goals and Significance

Often, high school students, including students potentially interested in environmental fields, are not introduced to all of the further education opportunities available to them. High school students are at a critical time in their lives because the occupation they pursue has a strong correlation to their personal identity and their reflection upon society (Ogowewo, 2010). Successfully preparing students for their future through a further education is a complex task that requires collaboration between high schools and colleges (Washor, 2007). My goal is to contribute to this collaboration by holding an "Explore Environmental Careers" workshop at a local high school. The intent is to encourage self-reflection on short and long-term goals, introduce students to opportunities, and provide resources and knowledge on what is necessary to succeed in college. Because Christen Foehring, the Pre Major Advisor for the College of the Environment, conducts a similar workshop, I worked with her to construct a workshop of my own. My goal was to be informative and engaging while encouraging self-reflection and pursuit of an environmental career.

I chose to focus the workshop on environmental careers for several reasons. For one, it is a large and broad field within itself and is growing. Secondly, as someone pursuing an environmentally related career, I am able to reflect on what I, and likely many of my peers, wish we knew sooner. And lastly, we have a moral obligation to fight climate change and the more people we have working on this complex task, the more of an impact we can have. Specialization and diversity across environmental sectors increases our capacity to use interdisciplinary knowledge to address challenges in complex systems (Keene, 2011). This project also allows me to strengthen my event planning, and teaching skills.

Context, Background and History

The US economy has dramatically evolved over the last century, with farming, manufacturing, clerical and middle management jobs having mostly been replaced by service jobs and professional careers. As a result of an evolving economy, schools constantly have to keep up with the changing needs of the workforce. Back in the mid 1970s, fewer than half of high school graduates went directly to college, and even less actually finished college. Since then, 50% more students are heading directly to community college and 25% more are going to four-year colleges (Conley, 2013). This increase in college attendance indicates that high school students view a postsecondary education as increasingly necessary to be competitive in the labor market, due to shifts in the economy and needs of the workforce. A high school diploma, which has long been the standard goal high schools aspire to prepare their students for, has become an inadequate means to secure employment or a long-term livable wage. We are no longer in an era where one can easily support a family with little formal education and as a result, the economic gap between the skilled and the unskilled is growing. Because of the shift in the structure of the economy and workforce, economic mobility has been increasingly linked to access to education and the ability to acquire skills and certifications.

The evolution of the economy and the needs of the workforce have had an influence on how schools are administered. As early as the 1920s, many school districts physically separated students who were pursuing vocational training from those pursuing college. These vocational training programs were high quality and prepared students for secure employment, with no more than a high school diploma necessary (Conley, 2013) By the 1960s, this model of separating students based on their future trajectories was the predominant way high schools were organized and continued to be through the end of the century (Conley, 2013). Only recently has this dominant model begun to be questioned, not because it doesn't make sense to provide different programs for students who want to follow different paths, but because of a doubt in schools' ability to ensure that students have the option of pursuing college. The vocational education model in today's economy can be seen as perpetuating social sorting, (recall the increasing role post secondary education has on economic mobility) and is competing with the modern notion of "universal readiness," where high school curriculums are standardized with the goal to prepare all students for postsecondary education. Standardizing the curriculums helped colleges and high schools empirically define what skills were necessary to be college ready and build academic content from there. My project promotes the ever more necessary collaboration between high schools and colleges when preparing students for life beyond high school, under the universal readiness model.

Literature Review

　　Prior to conducting my environmental careers and majors workshop, it was first necessary to assess the environmental career opportunities in order to justify the significance of the theme of the workshop. Because the workshop helps students explore environmental careers, it was also important to identify what factors have shaped contemporary career counseling and what resources are already provided to the students. For my workshop design, it was necessary to review workshops that have had similar objectives, including the environmental majors and careers workshop put on by UW. Lastly, to prepare for the classroom setting, strategies to improve student engagement were also reviewed.

Environmental Career Opportunities

　　With climate change often asserted as the largest issue humanity faces, it is critical that we have as many people with a range of interests and skills contributing to reducing the causes and effects of climate change as possible. This contribution happens through personal choices, including career choice. Environmental careers are increasingly important to building sustainable societies and therefore, in combination with economic pressures, are increasingly valuable. This can be seen in the dramatic increase in worldwide investment in clean energy technologies. The U.S. government, for example, invested an unprecedented $500 million in the Green Jobs Training Act of 2007 (Scully), which established green job training programs for individuals in need. Another example of large investment in green jobs is the American Recovery and Reinvestment Act of 2009, which gave nearly $30 billion in funding to energy projects and green jobs training (USA. Bureau of Labor Statistics). Although there are statistics about the number of jobs in the green energy sector, there is little reliable data available about the number and types of green jobs in the broader labor market. The data on green jobs that does exist uses a variety of green jobs definitions so results are not consistent. The lack of data on green jobs and the environmental labor market is largely due to a budget cut of over $30 million to the Bureau of Labor Statistics (BLS) during the Obama administration. The last report by BLS on Green Goods and Services (GGS) was in 2011, in which the number of GGS jobs increased by 157,746 to 3,401,279 (Green). Keep in mind that GGS jobs only include ones that are found in businesses that primarily produce goods and provide services that benefit the environment or conserve natural resources. Thus the range of other environmentally related jobs, which span across other traditional industry sectors from agriculture, fishing, and forestry, to transportation to education are difficult to count and therefore often left out of statistical analysis. The lack of data on environmentally related jobs may leave something to be desired but it is also an indication of a positive aspect of environmentally related careers. The very reason that it is difficult to collect data on green jobs, that is, its permeability into other industry sectors, shows how broad, flexible and interdisciplinary an environmental career can be. This indicates that a wide range of interests

and skills can be applied to an environmentally related career. The environmental field itself is relatively new, resulting in a lack of information about career opportunities and training needed. My workshop is able to address the information gap about the environmental field, giving students the opportunity to explore the broad range of environmental careers and make connections to their own interests and skills.

Career Counseling and Education

Understanding the goals of contemporary career counseling was important to shape how I approached my workshop. Constructivism, a theory about how people learn, provides a viewpoint from which to conceptualize careers in post-industrial societies. The theory suggests that people construct meaning from their own experiences, ideas, and new information. The lens of constructivism allows careers to be viewed, not as lifetime employment, but as a carrier of personal meaning that defines and structures significant events in life. From this perspective, career counseling should aim to increase self-reflection (Collin, 2000). After self-reflection, students are more prepared to think about potential meaningful careers. Career education and counseling should then also expose students to a full range of career opportunities, help them decide their occupational futures, and provide education and training appropriate to their career choices (Assessing, 1976). In addition to recognizing that a college education may be important to their success and gaining positive perceptions about college, students must also understand the nature of college, prepare academically, and set short and long term goals that support becoming college ready (Radcliffe, 2013).

Career education must also recognize that college is not just an intellectual challenge, but also a social and financial one as well. Career counselors must provide resources to address all of these challenges. Additionally, career education must also recognize that a four-year college degree is not for all students and shouldn't be pushed as a one size fits all goal (Washor, 2007). Although college isn't for everyone, my workshop does emphasize higher education because after speaking with the head counselor of Ballard High School, who I will discuss more later, I learned that approximately 80% of the students go on to 2 or 4 year schools, and that only a handful of each graduating class pursue vocational training programs.

Pedagogy

Before I was going to walk into the classroom, it was necessary to get further context of where students are in their career planning and what resources are being provided (and not provided) to them, so that I am not redundant or too sophisticated. To understand what career counseling is currently being done in high schools, particularly the one that I conducted the workshops in, I met with the head counselor at Ballard High School, Katherine Huguenin, a UW

alum. She put things in perspective for me, explaining that there are approximately 1900 students and 4.5 counselors. That means each counselor is responsible for over 400 students. Obviously resources are stretched thin. She told me the largest barrier the counseling team faces when preparing students for life after high school is the *information gap*. There is simply so much information related to careers, colleges and majors, and so many students who have a range of trajectories, that it is difficult to make sure that students are being connected with the resources most meaningful to them.

In terms of resources provided, the counseling office holds college and career night every other spring, where they host many types of post- secondary education representatives from technical fields, internship employers, 4 year schools, apprentice programs, and more, for students to explore. However, the fair has had admittedly low attendance, suspectedly due to its occurrence in the evening and non mandatory nature. The counselors also conduct visits to classes of seniors once or twice a year, as well as one-on-one meetings with students every year. As you can imagine, this amounts to approximately less than two hours of counseling that a senior student receives, much of which is solely devoted to making sure students are simply meeting the graduation requirements. The Seattle School District does have a graduation requirement related to career planning, called the High School and Beyond Plan. This plan requires a level of reflection and forward thinking of the students, and, as Katie explained, will become even more structured in the near future. The more structured plan is exciting to Katie and I because it will help to justify more efforts to bring in workshops such as mine, guest speakers, and other events, that will inform and engage students in their career planning.

Another barrier Katie mentioned that limited career planning efforts is the lack of class time teachers are willing to give up due to the pressure to produce certain test scores. In an attempt to accommodate this concern, I only invited teachers that taught classes that were most relevant to the topic of the workshop, and gave teachers that expressed interest the option to choose what day they would like to have it, so that it would be as little of a burden as possible on their schedule. Preparing students through career education is a complex task, which requires collaboration between high schools and colleges to be effective. My goal is that my workshop contributes to this collaboration and opens avenues for further collaborations in the future. In addition**,** because a goal of today's post industrial career counseling is to help students be prepared for careers that hold personal meaning to the individual, I incorporated a discussion of what skills, education, or experiences may be necessary to achieve a certain environmental career into the workshop. Through this exercise, students will have the tools to do the same critical thinking about other career paths that interest them. This is an important aspect of the workshop because students with a range of career interests will still be able to walk away with some insight, even though the workshop does have a specific theme.

Workshops and Student Engagement

When it came to designing my workshop and formulating how to evaluate it, I needed to look at similar workshops with similar objectives. A study done on assessing an air pollution workshop that engaged high school students draws a strong parallel to my project. The key thing to take away from the study is that it indicated, through a survey about the quality and impact of the workshop, that students were more enthusiastic about the demonstrations and hands on experiences than the presentations. The study also provides a systematic way to evaluate the success of workshops (Kubátova, 2013), which is important when designing my exit survey that is given to students. A similar study analyzed the effects that a STEM (science, technology, engineering, math) workshop conducted for millennial girl scouts had on their interest and confidence in STEM careers. The study found that the hands on activity was more enjoyable by students compared to the guest speaker and concluded that the girls had an increased interest in STEM careers. The study also found that the students were more confident in defining STEM and things associated with the field, indicating that the workshops were both engaging and informational. The findings were achieved through likert scale surveys that measured the girl's interest and confidence in science and science related activities (Mayberry, 2015). These two assessments of workshops that are of a similar nature to mine are helpful in designing my workshop. Considering the results of the studies, in addition to my own experience, I chose to make the main activity in my workshop hands on and interactive. Just as the studies have done, I also chose to conduct an exit survey in order to evaluate the quality and impact of my workshop.

Throughout my project, I have worked with Christen Foering, the undergraduate pre-major advisor for high school and transfer students in the College of the Environment at the University of Washington. Because my workshop is in line with a significant portion of Christen's work, I wanted to observe a workshop that she conducts for high school students touring the University of Washington. The content of her workshops varies depending on the group size, academic interests of the group, and intention on applying to the University of Washington. After asking some introduction questions to the students to gauge their interests and needs, the content of the presentation is customized by choosing which slide deck is most relevant. This customization is necessary due to the large amount of information ranging from descriptions of environmental majors, examples of careers, internships and classes, the UW application process, scholarships, and/or what skills are necessary to be successful in college. With typically less than an hour to engage, inform and inspire students, being able to adapt to the audience's needs is crucial to ensure that the most impactful information is being represented.

When presenting, Christen makes sure to acknowledge that even if students aren't planning on applying to UW specifically, most colleges and universities have similar programs. She also acknowledged that community college is a viable option that offers accessible resources

for students to later transfer to universities. This acknowledgement is important so that students who have difficulty finding the workshop relevant to their trajectory do not feel left out and can still take useful information away with them. One of the things that distinguishes this workshop from the two previously mentioned is that this one does not conduct any surveys to measure the workshop's effectiveness. Being able to produce qualitative and quantitative results measuring how engaging, informative, and inspiring the workshops are will be useful for others designing and conducting workshops with similar aims. One example of where my results will be useful is in Christen's College of the Environment Student Ambassador program in which similar workshops will be conducted by current UW students to prospective students. In addition to the evaluation aspect of my workshop, another way my workshop differs from Christen's is through the engagement component, which takes form in a post it note sorting and discussion activity. After learning about environmental careers and majors, teams of students will be challenged to write as many environmental careers as possible on post its, and sort the career post its into their respective majors. By doing so, students are able process the information just given to them, make connections between careers and educational paths, and see the range of possible careers.

Although I have had prior experience facilitating a classroom of youth, I also wanted to get a better understanding of strategies to conduct a classroom. One source related to student engagement identified four ways to encourage engagement (Howard, 2015). The four ways are as follows: 1) learn student names 2) respond with positive reinforcement 3) ask good questions 4) allow students time to formulate their thoughts. Utilizing these strategies will help me run my workshop more smoothly by making students feel comfortable and interested in the activity, ultimately improving their ability to engage, retain the information, and feel inspired.

Methodology

My idea to do a workshop for students to explore environmental careers originated from a panel that I participated in during a Dawg Days event for incoming freshmen to hear from students in environmental majors. I liked participating in something that encouraged students to pursue academics and careers in environmental fields and thought it was a shame that I, and likely most other students, had not encountered an event like this sooner. At that point, I knew I wanted to do something similar that involved high school students and information about environmental pathways.

My final product was a workshop. To get to the final product, I went through four major phases, starting with conception, moving to design, to execution, and finally to analysis. In the conception phase, I met with my mentor at the University of Washington, Christen Foering, who is the dean of pre-major advising for the College of the Environment, and with my mentor at

Ballard High School, botany teacher, India Carlson. I also met with the head counselor at BHS. These meetings helped me form the goals of my workshop and to choose to do a workshop, as opposed to an event or field trip, in the first place. Meeting with my mentors helped me compare significant tradeoffs regarding attendance, student demographics, logistics, and interest level.

Design

To execute an "Explore Environmental Careers" workshop at local high schools I worked closely with Christen Foehring, the Pre Major Advisor for the College of the Environment. Discussions with Christen and my contact at Ballard High School helped me make many decisions including whether to hold the event at high schools or on the university campus, what components of information to have in the workshop, how many classrooms to attend, etc. Tradeoffs such as attendance, accessibility, logistics, and feasibility of each location were considered. The intent of the workshop was to encourage self-reflection of interests, introduce students to opportunities, and provide resources and knowledge on what skills and experiences are necessary to pursue environmental careers and other careers more broadly.

Designing the workshop required building components within the workshop, including the presentation, activity, and exit survey. For the presentation, I had to consider what information would be most relevant for my audience by narrowing my content from the range of information that is typically included in information sessions such as majors, detailed program benefits, faculty, careers, scholarships, applications, research opportunities, internships, and more, into a digestible amount of information for students who may not necessarily be considering the University of Washington, an environmental career, or college of that matter. Not only did I have to make sure that the content of my presentation was relevant and digestible, I also had to make sure that the content would be thorough enough for students to be able to do the activity, which required that they apply their new knowledge about environmental majors and careers. As for designing the activity, I considered several individual and group activities that incorporated personal reflection of interests and skills, particularly an individual activity where students made bubble maps of words they associate with the environment before and after my presentation. I decided to instead do the team environmental career brainstorming activity because I postulated that it would be more engaging and more directly force students to apply knowledge that they learned from my presentation.

As for designing my exit survey, I had decide what I wanted to get out of the surveys in the first place. I wanted to gauge how well my workshop addressed my inform, engage, and inspire goals, as well as to gather demographic information to potentially see patterns. Balancing the desire to have all of this information with the desire to have the surveys be as short as possible with working within the short class periods, and to not be overwhelmed by data, led me

to have simple answer options, very basic demographic information consisting of age group and plans after high school, and only an exit survey, rather than a before and after survey. I had several people help with formulating my questions and answer options so that they were concise and as neutral as possible.

Product

The workshop itself was conducted in class periods of three science teachers. When introducing myself, I explained three reasons why I was there. On the personal level, I wish I had known about opportunities earlier on in my college/career planning. On a community level, I wanted to build a stronger relationship between Ballard High School and the University of Washington. Finally, on a global level, I wanted to show that climate change is something that requires many people with a wide range of interests and skills to make an impact. After my introduction I moved into the topic of environmental careers. I first gave students a standard definition of what an environmental career is, as defined by the U.S. Department of Labor, which is "Jobs in businesses that produce goods or provide services that benefit the environment or conserve natural resources". Then I acknowledged that this definition is narrow and vague. The next step was to brainstorm what someone with an environmental career actually does, what kind problems are they solving, and how are they solving them. This brainstorming is intended to show that people with environmental careers do a much more diverse range of things than the original definition. I then transition to the environmental majors portion where I describe the seven majors in the college of the environment, as well, perhaps even more importantly, describe how most non-environmental majors could be used to pursue an environmental career as well.

Once students have some context, I introduce the team activity. Using post it notes, teams must come up with as many environmental careers as possible, without duplicating ones that other teams come up with, and then sort them into their respective majors at the front of the room. After teams have a chance to see the entire board of sticky notes, we then discuss the results. Students shared what careers they saw on the board that surprised, what they know about people that have those careers, what skills and interests someone with those careers have, and, with their high school community service requirement in mind, what volunteering opportunities are related to those careers. With the last five minutes of class, students are given the exit survey and encouraged to take brochures, leave contact information, and ask further questions.

Assessment

To evaluate my workshop's effectiveness, I collected anonymous exit surveys from students to gauge how informative, engaging, and inspiring they were, as well as to gather

demographic data such as grade and expected plan after high school. The surveys provide qualitative and quantitative feedback through short answers and likert scales so statistical analysis and quotes can be used. The three main questions used to gauge the workshop's ability to address my goals were: "Do you feel more knowledgeable about what skills and experiences will be useful in pursuing your goals? Did you like the activity we did? Has this workshop increased your interest in environmental careers?" Answer options were a simplified scale of "Not at all," "Somewhat," and "Absolutely."
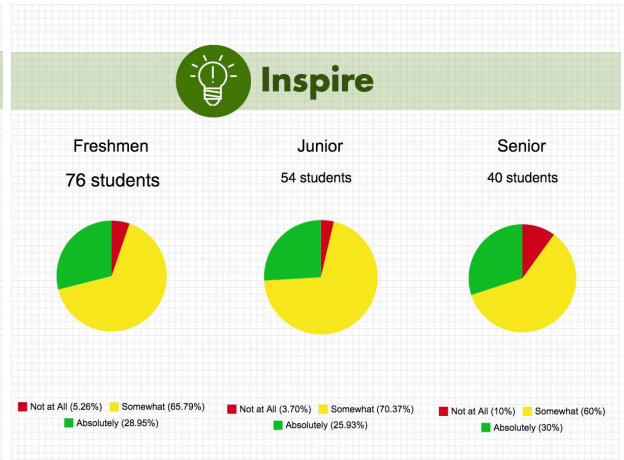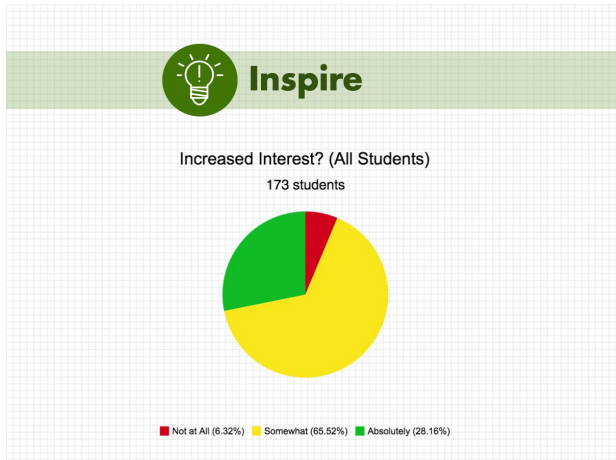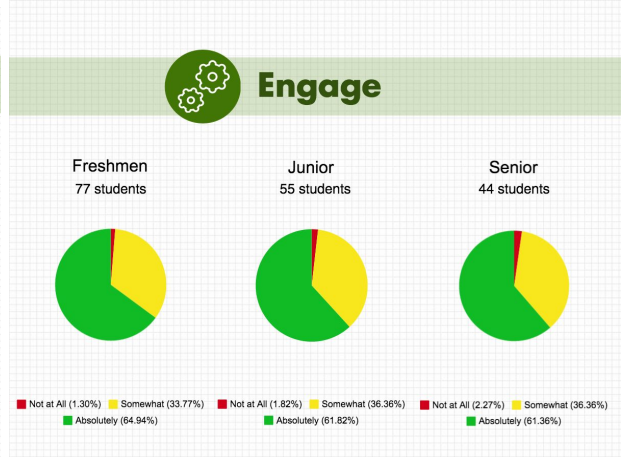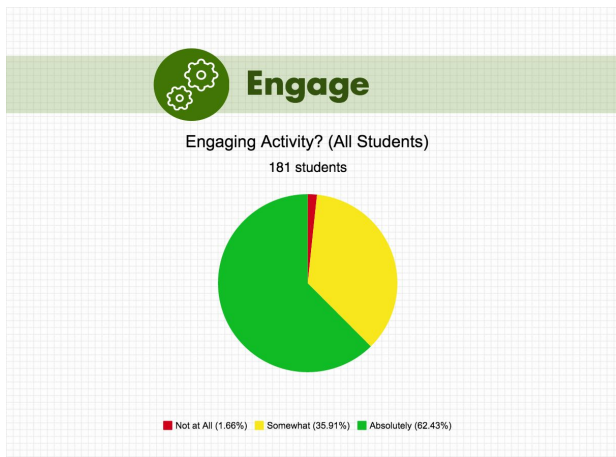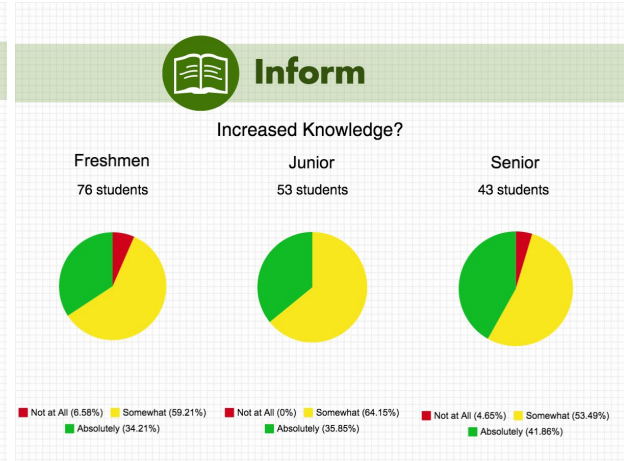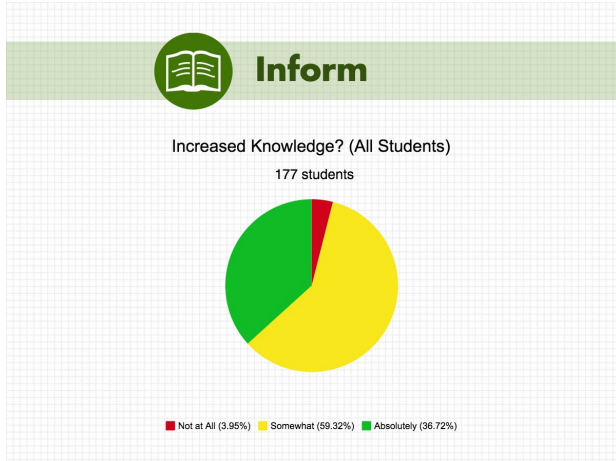
Results

I conducted my workshop for each class period for each teacher, speaking to a total of 15 classes, and collecting surveys from 182 students. More students were reached but due to teacher's schedules, not all classes received the complete workshop. Classes that did not do the activity portion of the workshop were not given exit surveys.

Sophomores were left out of my analysis in the age group breakdowns because there were only 5 in my sample. The engagement goal was the goal most strongly met, followed by inform, and then inspire. Inspiration varied the most across age group. Overall, my workshop was able to successfully address all of my goals to varying degrees. The red portion represents "Not at all," the yellow portion represents "Somewhat," and the green portion represents "Absolutely."

Qualitative data includes quotes from students in the feedback section of the survey. Themes identified from feedback quotes include positive engagement, enhanced learning, and areas for improvement. Examples of students expressing positive engagement include, "This was really fun and interesting! I loved it!," and "well spoken and clearly thought out." Examples of students expressing enhanced learning include, "helped broaden my knowledge about how many different careers are linked to the environment" and "it was cool to see all the career paths. Thanks!" Examples of students expressing areas of improvement include, "I would want more time," and "Include more examples of jobs in the field."

In addition to the quantitative data and qualitative quotes, I also collected contact information forms from students who expressed a particular interest in environmental majors to then be passed along to Christen, the dean of pre-major advising, so that she could connect them with further resources. Delivering a stack of these contact forms to Christen, and reporting that students took home brochures home with them, was a positive result of my workshop as well.

Inform — Increased Knowledge? (All Students) — 177 students
- Not at All (3.95%), Somewhat (59.32%), Absolutely (36.72%)

Inform — Increased Knowledge?
- Freshmen — 76 students: Not at All (6.58%), Somewhat (59.21%), Absolutely (34.21%)
- Junior — 53 students: Not at All (0%), Somewhat (64.15%), Absolutely (35.85%)
- Senior — 43 students: Not at All (4.65%), Somewhat (53.49%), Absolutely (41.86%)

Engage — Engaging Activity? (All Students) — 181 students
- Not at All (1.66%), Somewhat (35.91%), Absolutely (62.43%)

Engage
- Freshmen — 77 students: Not at All (1.30%), Somewhat (33.77%), Absolutely (64.94%)
- Junior — 55 students: Not at All (1.82%), Somewhat (36.36%), Absolutely (61.82%)
- Senior — 44 students: Not at All (2.27%), Somewhat (36.36%), Absolutely (61.36%)

Inspire — Increased Interest? (All Students) — 173 students
- Not at All (6.32%), Somewhat (65.52%), Absolutely (28.16%)

Inspire
- Freshmen — 76 students: Not at All (5.26%), Somewhat (65.79%), Absolutely (28.95%)
- Junior — 54 students: Not at All (3.70%), Somewhat (70.37%), Absolutely (25.93%)
- Senior — 40 students: Not at All (10%), Somewhat (60%), Absolutely (30%)

Implications

Although the results of the exit surveys suggest that my workshop was able to successfully inform, engage, and inspire students to varying degrees, I believe the real success of my workshop lies in my positive interaction with such a significant number of students. Not only

were students able to see an alum returning to their community as a role model, but students were also able to discuss the environment in a positive way. Unfortunately, much of what students learn about the environment is scary and depressing. Through my workshop, students were able to think through how their own interests could be used to make a positive impact on environmental issues, and in a fun and engaging activity at that. To this day, I still remember workshops and lessons that young adults conducted in my middle school science class about energy, waste, and climate change, that apparently have stuck with me after all these years. I get satisfaction knowing that my workshop will remain in the memories of at least some students. I recognize that my project does not resemble a scientific study or dissertation. It is simply unrealistic to measure the true impact that my time with them will have on their future decisions but I am pleased with the opportunity that I created to give back to my communities, have personal interactions with so many students, discuss the environment in a positive way, and broaden students' perceptions about what having an environmental career means.

Reflection

If I were to do my workshop again, there are a few things I would improve. For one, I would provide more examples of environmental careers from different fields and walk students through a potential thinking process. For example, I would ask students to name something they like. "French Fries!" someone yells out. Then I would talk through the life of a french fry and discuss who is involved, and how each of those people's jobs are related to the environment. From there we can make connections to the systems of good and services that provide us with the things we like, and how they relate to the environment and careers. During my workshop, I did this on a smaller scale with teams and individuals who were struggling but doing this from the very beginning would hopefully get students more easily engaged. I would also save more time for students to review the board once the activity is complete and for the discussion because these sections of the workshop always felt rushed. This could partially be addressed by setting clearer and stricter time limits for the activity.

Overall, I was pleased with how my workshop went and that students were generally very respectful and interested. From what I remember from high school, I was expecting students to be much less engaged and respectful. Although one day of workshops was right before a three day weekend, causing many of them to be less attentive, my confidence and preparedness helped students take my time seriously. I'm also very pleased with how well the activity went and my decision to make it a competition. Students instantly put their game face on. Seeing their enthusiasm was exciting to see.

I was also excited to see that students were taking home brochures for environmental majors at UW, as well as leaving contact information for me to pass along to an advisor to connect them to more resources. Potentially being a link in their education/career paths was a rewarding feeling. Several students expressed gratitude for my time with them both in person

and in their exit surveys. Having students go out of their way to tell me they enjoyed the workshop, ask questions and seek advice was a great feeling and resembled the exact personal interaction that I was hoping to create with my project.

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