ABSTRACT

The value of service-learning as a high-impact educational practice in college courses is further documented here through client-centered student projects seeking to increase SOLE food-sustainable, organic, local, and ethically produced--on the Utah State University campus. Honors students enrolled in a Think Tank series of courses in Science, Social Sciences, and Arts/Humanities completed six crossdisciplinary projects focused on various aspects of dining services and food sources on campus, including recycling, food waste, food recovery, and local sourcing. Postproject student reflections indicate that students were much more aware of campuswide sustainability issues and how they, as campus citizens, could contribute in meaningful ways. Student also demonstrated the ability to property design research projects and engage in datainformed problem solving as a result of their service-learning project. Students also learned to successfully work in groups and appreciate and encourage the strengths of each team member.

Seeking SOLE Food: Service-Learning and Sustainability in Honors Think Tank Courses

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Introduction

Do college students using campus dining services create excessive food waste or recycle with the environment in mind? Would students be interested in eating "recovered" food? Would students support a campus-based farmers' market of locally produced foods? How much food prepared by campus dining services could be labeled "real food"? How much food is wasted in food preparation? What happens to campus food waste at the end of the day? Can the amount of SOLE food-- sustainable, organic, local, and ethically produced--on campus be increased?

These are the questions that six interdisciplinary teams of Honors students sought to answer in a "Think Tank" course focused on agriculture, food, and sustainability. Students investigating campus dining services? Some might consider this biting the hand that feeds you, but this service-learning project was supported by the director of our university dining services. The director pointed out that Dining Services would like to be more sustainable in keeping with the university's participation in the American College and University Presidents Climate Commitment (ACUPCC). Research universities such as ours have the ability to undertake research of sustainability programs, educate students about the importance of sustainability, examine problems and create solutions, and provide leadership in their communities. In addition to striving for climate neutrality, another initiative is a sustainability curriculum. However, sustainability programs have to be economically viable, implementable, i.e. people have to want to do it, and must have measurable positive environmental effects.

The idea for the Honors Think Tank course came from the Honors program's director and is part of the university's commitment to developing courses with sustainability content. She organized three sections of the upper-level Honors course, one focused on Science, one on Social Sciences, and one on Arts and Humanities, and then recruited appropriate faculty to teach each. The courses fulfill General Education "depth" requirements. The faculty met with their own sections, but on occasion, all three groups convened together. In the first such joint meeting, student were treated to food: cheese and crackers. When we asked, "Where do you think the cheese was sourced from?" they automatically replied that it must be local as our university is positioned in a valley well known for its dairy products. Additionally, the campus has a dairy science research and academic unit and has also won "Best Campus Dairy Herd" in the country. Disabusing them that this cheese product actually hailed from the Midwest was one of the first lessons about sustainability and local sourcing. It was actually cheaper for our campus dining services to source cheese from hundreds of miles away even though the cost in fossil fuel consumption was a negative. The section of Arts/Humanities read as one of its course texts Barbara Kingsolver's Animal, Vegetable, Miracle: A Year of Food Life, a narrative about how a family chooses to "live off the land" for a year. A feature of the book is the chapter inserts by Stephen L. Hopp, who contributes social, economic, and political insights. In one such insert, he points out, "Each food item in a typical U.S. meal has traveled an average of 1500 miles" (2007, p. 5). Even though, our dining services had the option of sourcing its cheese locally, it chose to use a vendor that supplies cheese from 1500 miles away.

The three course sections met jointly multiple times during the term. At the beginning of the term, the three faculty members shared agriculture, food, and sustainability themes from each of their three perspectives, giving students background on the real issues of sustainability. Students were informed of some startling statistics, such as close to 40% of all food is wasted in the United States. They kept their own food and waste log for a week to assess where their food came from and how much went to waste, recycling, or composting.

Additionally, they shared common readings: Wendell Berry's National Endowment for the Humanities Jefferson Lecture, "It All Turns on Affection" and *A Pivotal Time in Agriculture* from the National Academy of Science. They took field trips to exemplars of sustainability: a coffee-roasting facility; an organic flourmill; a local sourcing restaurant, a permaculture garden on campus, and a working direct marketing farm. They also assembled in groups to work on the service-learning project as students from across sections collaborated on specific topics. This article describes the process whereby the students moved from inception to dissemination of findings and reflection. Student project findings will be discussed on a limited basis.

Benefits of Service-Learning in the Classroom

Reports from similar course-based service-learning projects have appeared in the pages of this journal. Kulhavy and Unger (2015) described a course in natural resources in which students (also in six teams) worked with state and national organizations to develop a Firewise certification and an historical trail—among other outputs. Neese, Field, and Viosca (2013) designed a marketing class in which students

provided *pro bono* research services to small firms and non-profit organizations. In the same issue, Crone (2013) developed a service-learning component in a Social Psychology class to "challenge students to apply social psychological theories to societal issues of their choosing" (p. 70).

Vavasseur, Hebert, and Naquin (2013) paired preservice teachers with fifth graders virtually to provide tutoring, helping the students and providing professional development opportunities to the college students. Stewart (2012) seems to suggest that when Honors students engage in service-learning, it may be wise to do so when they are upper division students rather than newly-matriculated. This study has implications for our article in which juniors and seniors, for the most part, enrolled in the Think Tank and demonstrated an understanding of campus and a maturity level that contributed to the final client deliverables. Van Meter, Reichwald, Blair, Swift, Colvin, and Just (2012) wrote about sustainability but not in the way in which our service-learning project was directed. Instead, they focused on developing "sustainable citizens" and enhancing civil discourse between students and community members.

The advantages of service-learning research projects in agriculture-related courses have been well documented (see Knobloch, 2003; Roberts, 2006; Parr et al., 2007; and Retallick and Steiner, 2009). For example, Curtis and Mahon (2010) found that their service-learning project enhanced student learning over other assignments, especially for those with a higher frequency of interaction with industry professionals. Additionally, students stated an improved depth of content knowledge, improved professional understanding, and a deeper awareness of their strengths as a result of the service-learning project.

The value of service-learning as a high-impact educational practice has been demonstrably assessed in the work of George D. Kuh (2008) in conjunction with the Association of American Colleges & Universities (AAC&U) and the National Survey of Student Engagement (NSSE). Kuh describes service-learning and community-based learning in this way:

In these programs, field-based "experiential learning" with community partners is an instructional strategy—and often a required part of the course. The idea is to give students direct experience with issues they are studying in the curriculum and with ongoing efforts to analyze and solve problems in the community. A key element in these programs is the opportunity students have to both apply what they are learning in real-world settings and reflect in a classroom setting on their service experiences. These programs model the idea that giving something back to the community is an important college outcome, and that working with community partners is good preparation for citizenship, work, and life. (p. 11) Another initiative by the AAC&U is LEAP: Liberal Education, America's Promise.

Our state has been identified as a LEAP participant. Among its goals, LEAP promotes high-education practices but also projects in which students "can apply their learning to complex problems and real-world challenges" while also engaging in a "substantial cross-disciplinary project in a topic significant to the student and society" (American Association of Colleges & Universities, 2005). The Think Tank project teams were structured in just this way: cross-disciplinary teams studying complex problems in

campus dining services and recommending solutions to make the campus not only a better place to live and study, but also more sustainable.

The Student Projects

The overarching themes for the service-learning projects focused on sustainable food sourcing, food waste management, and food recycling and recovery. These projects are part of a larger trend on campuses to be more mindful of food access and sustainability. Higher Education Food Summits are occurring on a state-by-state basis. Many campuses are joining the Real Food Challenge

(http://www.realfoodchallenge.org/). With a goal of 20% of campus food being "Real Food" by 2020, the Real Food Challenge seeks to "leverage the power of youth and universities to create a healthy, fair and green food system." The aim is to "shift \$1 billion of existing university food budgets away from industrial farms and junk food and towards local/community-based, fair, ecologically sound and humane food sources" (Real Food Challenge, "About Real Food Challenge").

To help meet the sustainability goals of our campus, the projects focused directly on campus dining services. Campus dining services had collected some data, but it was intermittent and had not necessarily been acted upon. For instance, a student intern had cataloged composting totals for dining services (see Figure 1), but follow-up was not as robust as desired. The client wanted to see clear-cut implementation plans, which was the task of the Honors Think Tank student projects.

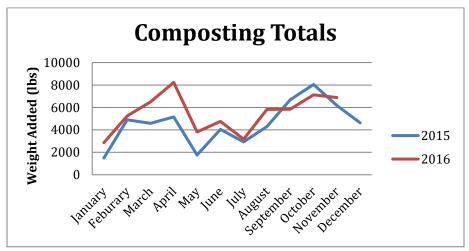


Figure 1. Composting Totals 2015-2016

Also incorporated was a food recovery program, initiated by committed students who voluntarily picked up on a daily basis leftover food that would otherwise be composted or thrown away. The Student Nutrition Access Center (SNAC) was founded in 2010 by a few students concerned about student access to food. They began by assembling recovered food in a single metal cabinet. As of this writing, the larder includes recovered food from campus dining services, canned and boxed food donated by the community food pantry, and (when available) fresh vegetables from the student organic farm. Another project focused on a weekday campus farmers' market to

augment the community version, which assembles on Saturdays in a downtown location. In all cases, pursuing a SOLE food philosophy was in play.

The six student group projects included the following:

- 1. Dining Services food sourcing assessment and implementation plan See Real Food Challenge at http://www.realfoodchallenge.org/
 - a. Determine what portion of currently sourced food falls under the "real food" definition.
 - b. Create a plan and implementation strategy to increase the portion of "real food" sourced, including timeframe, employee and user incentives, local and regional sources of "real food" in terms of companies, food types, amounts, etc.
- 2. Dining Services food service food waste assessment and implementation plan
 - a. Determine the current portion of food provided by dining services that is wasted.
 - b. Create a plan and implementation strategy to decrease the portion of food provided that is wasted, including timeframe, employee and user incentives, pricing schemes, processes, physical components of food service, etc.
- 3. Dining Services kitchen and preparation food waste assessment and implementation plan
 - a. Determine the current portion of food sourced by dining services that is wasted in food preparation by kitchen workers.
 - b. Create a plan and implementation strategy to decrease the portion of food wasted in meal preparation, including timeframe, employee incentives, processes, etc.
- 4. Dining Services reuse (recycling, composting) assessment and implementation plan
 - a. Determine the current portion of food service products that are currently recycled, composted, and/or channeled into some type of reuse program.
 - b. Create a plan and implementation strategy to increase the portion food service products channeled into a reuse program, including timeframe, employee and user incentives, processes, potential end-uses for products, etc.
- 5. Campus Farmers' Market feasibility assessment and implementation plan
 - a. Determine potential/projected demand (community) and supply (vendor) for the market and conduct a SWOT analysis.
 - b. Create a management and implementation strategy including structure, products, vendors, location, hours, incentives and promotional ideas, etc.
- 6. University Food Recovery Network/Student Food Pantry program assessment and expanded services implementation plan
 - a. Assess the impact of the program to-date in terms of reducing food waste and student food insecurity.
 - b. Create a plan and implementation strategy to expand program services in terms of food recovered, students serviced, and community partners, including timeframe, incentives, processes, etc.

Each of the six teams (3-4 students from each section, representing science, social sciences, and arts/humanities) developed a plan and implementation strategy for its focus topic. They had the opportunity to apply for a grant from the campus sustainability office to provide funding for data collection, materials, and printing. The teams presented their findings at a culminating poster presentation. Projects were evaluated by fellow students, Think Tank instructors and undergraduate teaching fellows (UTFs), project mentors, and guests.

Group Dynamics

To begin, we wanted to ensure that teams had successful experiences. Thus, we were clear about processes, particularly about working in groups, which can be fraught with tension, especially resentment of those who "pull their weight" in workload as opposed to those who don't. We began with a comic infographic (see Figure 2) to get those feelings on the table to discuss how to make a group project workable and enjoyable.



Figure 2. Avoiding Group Project Dysfunction Source: Meme Center (2014).

Faculty members each took responsibility for oversight of two of the teams. We set up ground rules, including the following:

- You've been assigned to one of six project working groups. The first order of business is to communicate with your team members and set up a regular time for weekly working meetings (using a Doodle poll at doodle.com may be efficient for finding a day/time that works for all team members. You'll also need to find a time when you can meet with your faculty mentor, which generally will take place during the working day.
- 2. Consider rotating the team lead on a weekly basis, based alphabetically on last name.
- 3. At your first meeting, take time to get to know each other. Come prepared to the meeting with a written response on your ideas for the project. Compare notes and

- come to a consensus on the content and processes of the project. Draft a timeline with an end goal of completing the poster by April 20.
- 4. File a brief progress report with your faculty mentor at the conclusion of each team meeting. This can be done via the university's BOX system by inviting team members and the mentor to share files/folders. Rotate the progress report writing duties among team members. The progress report should include attendance, date, time, accomplishments, and a "to do" action list. (See Figure 3 for a template of progress reports.)
- 5. Meet with your faculty mentor to confirm the project content and processes and adjust as needed.
- 6. Begin working on the project, dividing workload equitably. Consider assigning roles within the group: facilitator (keeps group on task and verifies that all contribute); recorder (takes notes and writes progress report); materials manager (keeps materials in orderly on box.usu.edu or other repository); time keeper (keeps track of time and ensures that group works efficiently, both in individual meetings and on the project as a whole); summarizer (restates the group's conclusions and responses and checks for clarity; asks if anything important has been left out); encourager (affirms contributions and actions; provides a sense of humor).
- 7. We also shared the evaluation rubric that each team member would fill out assessing others' contributions to the project.

Progress Report Template

Team Project: [1-6, topic]
Date/time of meeting:
Team Members Present:
Team Members Absent:

Summary of project progress (generally a paragraph that uses concrete details):

Figure 3. Progress Report Template

The Research Process

Each team developed appropriate research processes for its particular topic. One team looked at waste, which they determined required sorting through garbage. The six team members gathered three heaping black trash bags from one of the dining service venues. Wearing latex gloves, they sifted through garbage: stale bread, rotting vegetables, plastic forks and packaging. They took notes on what they found and measured: a waste audit. This project focused on the pre-consumer stage and explored ways in which kitchen operations could be more sustainable. The students were on site, observing food preparation practices. They felt that composting was not utilized as much as it could have been. They saw food items that are compostable being thrown in trash bins bound for the landfill. They needed empirical evidence to back up their eyeballing. Enter the waste audit of kitchen garbage cans. A significant amount of waste was actually compostable, reducing landfill waste. The solution? Place more composting receptacles conveniently throughout the kitchen.

Student reflections of the projects sum up well the relevant components of a service-learning research project of this nature:

"Because we were essentially creating our own research project, we had to determine what calculations to use, how to best present our findings, and how to best solve the problem at hand – namely increasing and effectively utilizing composting in the kitchen. In the end, we presented conclusions that through increasing composting receptacles and more effectively communicating composting regulations to employees, the kitchens would improve their sustainability immensely."

"As we separated into groups to tackle different parts of the issue, it was obvious some were more passionate about it than others. It was imperative those working to solve the issue were invested in it. As I developed a passion for campus sustainability, my group members, too, discovered their passion for it. Our individual classes fostered passion as we discussed more ways to solve local problems. Finally, as we presented our findings to the heads of Dining Services, we could see them catch the spark, and start developing their own passion for increasing sustainability in their kitchens. The influence of one can impact many."

"I learned several skills from this project, particularly about how to conduct research. Previously, I did not know how to formulate a meaningful question or guide the project into its next stages. I see now that it is a graduate process-it may not come all at once. Rather, it requires work and research at one step to advance to the next and eventually become more involved in research or community projects in the future, both locally and abroad."

"The project demanded that I learn how to actively communicate with others in my group. We had to share our own ideas and engage with each other to accomplish our goals, often in compromise. The variety of people's strengths and weaknesses took on a new reality in my mind."

Project Results and Dissemination

The proof is in the pudding might be an apt metaphor for these food-related projects. As a culminating activity, teams presented their posters and ancillary materials to the clients and others. At the beginning of the project, we shared information on effective poster designs, which was repeated at the time of the actual poster development. We felt it important to describe completely the project when first assigned to avoid surprises. One half of the class members were stationed by their posters to explain while the other portion circulated among the posters, queried the researchers, and completed evaluation forms (see appendix).

The waste audit at one of the campus dining venues is the subject of the poster below (see Figure 4). In addition to students measuring waste, they staged an intervention to inform users of what materials could be recycled. The amount of recycled materials increased by 29%. The amount of recyclable material in trash bins decreased by almost 6'5, and contamination of recycling bins decreased by almost 29%. The offered details on implementing change that could result in reduced waste and

increased recycling. The teams also produced a research report. We provided a template to follow, which is included in the appendix.

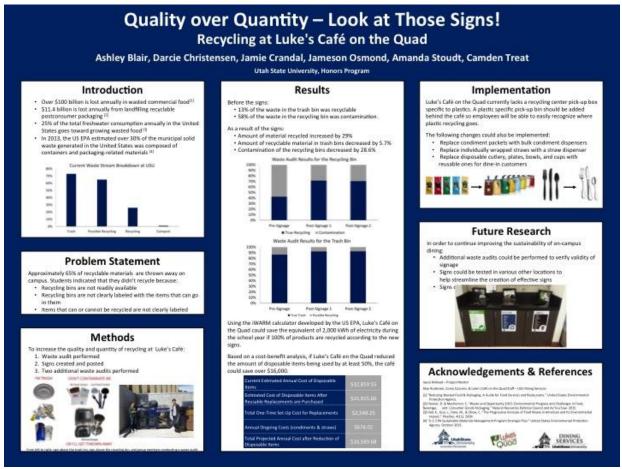


Figure 4. Student Team Poster Example

Student Learning Impacts and Reflections

Rubrics can tell only part of a story. Students completed a grid evaluation form, but they also wrote a narrative about their experience with the service-learning project. What was the story behind the scenes? What was the impact of the project on each one as a learner and citizen?

The question prompts for the narrative included these:

- 1. This is termed a "service-learning" activity as researchers and clients form a partnership to solve problems. How did service-learning affect you as a learner and a person?
- 2. What did you learn by doing this project?
- 3. Did your communication skills improve as a result of this project?
- 4. What would you do differently in organizing a team project next time?
- 5. How did your teamwork skills improve or not?
- 6. What do you wish you had done differently?
- 7. Of what are you most proud?
- 8. What research skills did you learn?

- 9. Did your technology skills improve?
- 10. Did you learn more about campus as a result?
- 11. How might this project influence you as a student and a citizen--in the particular theme of sustainability?

Student learning reflections demonstrating the impact of the project include:

"Effective teamwork was one of the greatest things to be learned from this project. In life, few things go according to plan. Sometimes, unseen problems occur. Other times, deadlines and regulations make a project stressful. This service-learning project helped to bring some of these situations to the forefront and allowed the chance to develop needed teamwork skills to overcome them. College provides an environment where groups of educated people come together in collaboration for a common goal. This project had a multidisciplinary aspect to it, something that closely resembles life experiences. Coming together as a team brought different talents and skills. Some brought a knack for math; others brought a gifted artistic ability. We used our unique skills to work together in gathering information, communicating that information to each other, reflecting on and documenting the information, and finally, presenting our findings in the utmost professionalism. Because our society is built on the interaction of people, these interpersonal skills are an important thing to be learned through education. Traditional lecture classes cannot offer what small, group projects can. Teams are essential in making a difference."

"As I engaged in improving an on-campus issue, it was a process to develop a passion for our project. I have never been heavily involved in sustainability or civic opportunities, yet here I was, a student aiming to convince a university that they could be more sustainable."

"I attended the service-learning banquet and the keynote speaker talked about the obligation we all have to be contributing members of our communities. If this project has taught me anything, it is that I want to be a better community member and do more to improve life for everyone around us."

"This is the biggest and most effective group project I have been on. I was working on something real and of lasting value, and I was going it with a lot of intense, strong-willed people. Asking people to change their process is difficult and painful. I am so grateful that I learned how to write a grant. That will serve me well in the coming years."

In addition to course-based evaluation, our institution's Service-Learning Program asks for continuous tracking across the term and end-of-term assessment in order to gauge impact and to use feedback to improve the program. Hence, students logged service hours through an online tracking system through the term. At the end of the term, students completed a Think Take evaluation survey along with faculty and service-learning partners. Finally, the Honors Program office chronicled the students engaged in service-learning through photos at study sites, field trip sites, and the

presentations session. Our two Undergraduate Teaching Fellows (UTFs) were very helpful in this regard and also wrote a blog for the Honors Program website.

Conclusions

Through the integration of teaching and research, scholarship and engagement, learning and doing, service-learning responds to community needs while enhancing student learning. Service was integrated in such a way that students applied the knowledge and skills they learned in class such as behavioral economics and food consumption to meet community needs. Students said in their post-class evaluations "The service project required to apply what we had learned," and "It helped me connect to the world and get more out of my education." Consistently, students noted in their reflections about the service-learning projects that "Working in teams with people from different disciplines helped me understand how real-world professional research will take place." That multi-disciplinary perspective was also present in comments such as this one: "It's important to have a broad range of knowledge to be able to solve problems in a more efficient and complete manner." Service-learning courses, according to another student, don't function like "normal education" but are representative of the way things "will happen regularly in my career."

The final projects offered helpful suggestions to improve current local sourcing, food waste management, and campus dining programs and were delivered to the clients. Using real world applications in the classroom greatly improved the student learning experience and made them much more aware of the quest for SOLE food as part of a sustainable campus. As one student noted in a reflection, "I can never shop in a grocery store, buy food at a café, or approach a waste bin in the same way after engaging in food and sustainability-based service-learning and research."

Our desired outcomes in these service-learning projects were that our students were much more aware of issues of sustainability and how they as campus citizens could contribute in meaningful ways. As members of a research university, we particularly wanted to imbue these service-learning projects with data-informed problem solving that could be replicated at other campuses. A distinctive element of this service-learning initiative is that our "community" was located on our own campus. "Everyone is part of a community," according to one student reflection, "whether it is a neighborhood community or an academic community." In thinking about projects that have transformative power, we need to look also at our own campus community, which can benefit from the work and passion of students engaged in authentic research. As a student summed up the project in a reflection, "The projects we did mattered."

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Appendix:

1. Template for Research Reports

Project Assessment and Implementation Plan

Team Members [list names with e-mail addresses]

Introduction

[Explain the research question and the purpose of the study.]

<u>Theoretical overview and review of literature</u> [here or later]

Context of the Study

[This section may include information about the researchers, the purpose of the research, or the origin of the research question. This may be the place to include information about the baseline information for the study. What did you find about the impact of the program to date in terms of reducing food waste and student food insecurity. What are the goals of your project?]

Method

Explain the approach of the research study.

Results and Recommendations

Create a plan and implementation strategy to expand program services in terms of

- food recovered,
- students serviced.
- and community partners

Implementation

- timeframe,
- incentives,
- processes,
- other

References

Appendices

Acknowledgements

N. B. Include charts, graphs, photographs as needed; don't forget to insert page numbers.

2. Oral Presentation Evaluation

Faculty	Group Name/Topic	
Student	Date	
Guest □		

Oral Presentation Evaluation Rubric

Opening:		Stellar		Good		Needs Work	
Team members introduce themselves	5	4	3	2	1	0	
Strong opening that engages audience		4	3	2	1	0	
Provides overview/preview of project		4	3	2	1	0	
Transitions:							
Transition from speaker to speaker handled smoothly; speakers "share floor" equally		4	3	2	1	0	
Connection with materials presented in class noted		4	3	2	1	0	
Sections move efficiently		4	3	2	1	0	
Substance of Presentation:							
The significance and impact of the material is clear	5	4	3	2	1	0	
Material is technically correct and appropriate for problem addressed		4	3	2	1	0	
Technology:					V.C.		
A handler for technology (separate from speaker)	5	4	3	2	1	0	
Visuals are handled competently		4	3	2	1	0	
Closing:							
Strong closing that doesn't taper off	5	4	3	2	1	0	
Acknowledged help received (e.g., client, City)		4	3	2	1	0	
Audience thanked, Questions and comments invited		4	3	2	1	0	
Team members answer questions competently and manage comments		4	3	2	1	0	
Timing:							
The presentation concludes within 15-20 minutes (firm cut-off at 20 minutes)	5	4	3	2	1	0	
Professionalism:							
Speaking is professional (e.g, avoided "things" and used concrete words; no grammatical errors such as using "me" as a subject; avoided ums and ahs)	5	4	3	2	1	0	
Credible clothing and appearance	5	4	3	2	1	0	
Well-rehearsed	5	4	3	2	1	0	
Body language:							
Connects with audience; speaks directly and audibly; good eye contact		4	3	2	1	0	
Confidence when giving presentation (Stood with feet shoulder width apart; did not rock back and forth or shift weight between feet. Arms comfortably at sides; not folded or partially crossed or in pockets. No gum.	5	4	3	2	1	0	
TOTAL SCORE (0-100):				· ·			