Evaluation of the 2012 Project-Based Introductory Statistics Curriculum Summer Workshop

Summative Report
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Section 1. Executive Summary

1.1 Overview

In June 2012, **SmartStart Educational Consulting Services** conducted an evaluation of the *Project-Based Statistics Curriculum Summer Workshop*, which was hosted by the Quantitative Analysis Center at Wesleyan University. The focus of this evaluation was to assess the quality of activities conducted, the impact on project participants, and achievement of workshop goals.

The *Workshop on Project-Based Statistics* seeks for participants to:
- Increase their knowledge of principles, pedagogy, merits, and limitations of project-based instructional design.
- Plan to try, use, or take up individual features and resources from the project-based curriculum and incorporate them in their instruction.
- Identify interdisciplinary opportunities for teaching introductory statistics by networking with other participants and sharing insights and resources.
- Recommend the project-based approach to others at their institution who are responsible for decision making around statistics curriculum.
- Be motivated to submit a proposal to develop, implement, and/or assess project-based statistics curricula.

1.2 Summary of findings

Based on the results of this evaluation key findings and recommendations for the workshop on Project-Based Statistics have been identified.

The majority of the attendees were female (58%) and Caucasian (73%). The majority (89%) were not from institutions that serve large under-represented minority groups. Continue efforts to increase the number of minority participants by reaching out to faculty at institutions that serve large under-represented minority groups.

All components from the workshop were rated very good to excellent and participants offered a great deal of praise for the speakers and reported the sessions were enjoyable, useful, and even inspiring. Participants offered a number of specific suggestions about the content, format and logistics of the workshop. Project staff should review the specific comments in the report above to glean ideas for how to improve what is generally a very well-received workshop.

Goal 1: Overall, participants indicated that their knowledge of project-based instructional design increased a *good amount* or a *great deal*, with their growth in knowledge of the "principles of project-based instructional design" rated the lowest. Consider increasing the amount of coverage of the principles of project-based design in the sessions offered.

Goal 2: The majority of participants (~60%) were very likely or extremely likely to incorporate most of the resources into their instruction. The two categories many participants reported being *not likely at all* or *a little likely* to include in their instruction were "translation syntax for statistical software programs (R, SAS, Strata, SPSS)" and "Catalyst resources". In future evaluations it would be valuable to find out why participants are less interested in teaching

syntax translation. Is it a resource issue? Are they concerned it is to challenging for their students? In addition, consider more coverage specifically about how the resources of the Catalyst program could be useful to participants.

Goal 3: At least half of the participants reported a *good* to a *great deal of gain* for all goal 3 categories, except "knowledge of working with departments other than their own to develop an introductory statistics course." Institutional barriers interfere with interdisciplinary course development. Consider discussing and presenting participants with examples of how institutional barriers have been overcome.

Goal 4**:** At least half of the participants were *very* or *extremely likely* to approach others about curriculum decisions. However, about a third of the participants were less likely to approach administrative personnel and about a quarter were less likely to approach instructors in other departments. Participants may need specific guidance, in the form of examples and advice of how to approach faculty and administrators outside their department.

Goal 5: Participants' responses were mixed about whether they would develop, implement, or assess project-based statistics curricula. While there were more positive responses than negative, many respondents indicated they were *not likely at all* or *a little likely* for developing (40%), implementing (34%), and assessing (34%) project-based statistics and curricula. Discuss this issue at the end of each workshop to facilitate implementation. In future evaluations, adding open-ended comment responses following the Likert-scale will allow participants to explain the impediments that prevent them from developing, implementing, and/or assessing the project-based statistics course and curricula. Hold discussions about these issues with participants.

A complete list of key findings and recommendations is included in Section 4 of this evaluation report.

Section 2. Introduction

2.1 Background of the project

In the winter of 2009, the Wesleyan University Quantitative Analysis Center (QAC) received a National Science Foundation grant to establish a Project-Based Introductory Statistics Curriculum.[1] The Wesleyan University project entitled *An inquiry-based, supportive approach to statistical reasoning and application* makes substantial recruitment efforts that are focused on engaging women and underrepresented students during their freshman year, so that their experience can maximally impact the direction of their undergraduate education. The project also intends to have a broader impact by providing more quantitatively literate individuals, and a larger, more gender and ethnically-balanced population with the kind of skills needed to communicate quantitative information across disciplines. It also intends to disseminate the newly developed teaching tools and supportive resources widely available to other universities. To work towards project dissemination, a two day *Project-Based Introductory (PBI) Statistics Curriculum Summer Workshop* was conducted at Wesleyan University. Individuals interested in learning additional methods and concepts for teaching introductory statistics attended this workshop. On the first day, an overview of project-based learning was presented and participants had the opportunity to interact and participate in a general discussion with students who have taken a PBI Statistics course. On the second day participants worked with various statistical software that could be used in a PBI Statistics course.

Workshop goals

The goals of the Project-Based Introductory Statistics Curriculum Summer Workshop are that participants will:

Goal 1 - Increase their knowledge of principles, pedagogy, merits, and limitations of project-based instructional design.

Goal 2 - Plan to try, use, or take up individual features and resources from the project-based curriculum and incorporate them in their instruction.

Goal 3 - Identify interdisciplinary opportunities for teaching introductory statistics by networking with other participants and sharing insights and resources.

Goal 4 - Recommend the project-based approach to others at their institution who are responsible for decision making around statistics curriculum.

Goal 5 - Be motivated to submit a proposal to develop, implement, and/or assess project-based statistics curricula.

Workshop participants

Workshop participants consisted of individuals interested in learning additional methods and concepts for teaching introductory statistics. Of the 41 people who attended the Project-Based Introductory Statistics Workshop, 38 completed the online demographic survey. The majority of respondents were female (58%) and Caucasian (73%). Sixty-eight percent were associate, assistant, or full professors. The majority were affiliated with Bachelor's (46%) and Doctoral degree granting institutions (35%). Four respondents (11%) were from institutions that serve large proportions of under-represented minority students. Participants came from 21 different states and one was from Canada. The demographic description of survey respondents is shown in Figure 1.

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[1] NSF WU Award Page http://www.nsf.gov/awardsearch/showAward.do?AwardNumber=0942246

Figure 1. Demographic characteristics of workshop participants

	2012 Workshop participants	
	#	%
Gender (n=38)		
Male	16	42%
Female	22	58%
Race or ethnic background (n=36)		
African American or Black	4	11%
Asian	3	8%
Caucasian or White	27	73%
Hispanic or Latino	0	--
Middle Eastern	1	3%
Native American or Alaska Native	0	--
Native Hawaiian or other Pacific Islander	1	3%
Institution of affiliation (n=36)		
2-year institution	0	--
Bachelor's degree granting institution	17	46%
Master's degree granting institution	4	11%
Doctoral degree granting institution	13	35%
Nonacademic organization	0	0%
High school	1	3%
K-12 Independent school	1	3%
Designation of institution (n=38)		
Historically Black College	0	--
Institution with high Black or African American Enrollment	1	3%
University American Indian Tribally Controlled College or University	0	--
Institution with high American Indian or Alaska Native Indian Enrollment	0	--
Institution with high Hispanic Enrollment	2	5%
Institution with high Native Hawaiian or Pacific Islander Enrollment	0	--
Institution with high Disabilities Enrollments	1	3%
None of these	34	89%
Primary discipline teaching (n=38)		
Earth and Environmental Science	2	5%
Education	1	3%
Math and/or Statistics	13	34%
Political Science	1	3%
Psychology	12	32%
Sociology	3	8%
Political Science and Health Sciences	1	2%
Biostatistics	1	2%
Educational Psychology	1	2%
Public health	1	2%
Epidemiology	1	2%
Operations and Supply Chain Management	1	2%
Position for the 2012-13 academic year (n=38)[2]		
Graduate student	4	10%
Postdoctoral fellow	6	14%
Instructor (assistant, associate, full professor)	27	68%
Academic administrator (Chair, Dean, etc.)	0	--
Visiting Instructor	1	2%
High School Teacher	2	5%
Consulting Biostatistician	1	2%
Teaching responsibilities in math department	1	2%

[2] Percentages do not equal 100 because respondents selected more than one response.

2.2 Background of the evaluation

The focus of this evaluation is to assess the quality and usefulness of workshop activities, impact that participation in this workshop has on participants, and achievement of workshop goals.

Guiding evaluation questions

Guiding evaluation questions are based on the workshop goals.

- Has participation in the PBI workshop increased participants' knowledge of principles, pedagogy, merits, and limitations of project-based instructional design?
- Do participants plan to implement features and resources from the project-based curriculum?
- Have participants identified interdisciplinary opportunities for teaching introductory statistics by networking with other participants and sharing insights and resources?
- Will participants recommend the project-based approach to others at their institution who are responsible for decision making around statistics curriculum?
- Are participants motivated to submit a proposal to develop, implement, and/or assess project-based statistics curricula?

Assessment development, data collection, and analysis

To evaluate the usefulness of the PBI Statistics workshop, the evaluator developed an evaluation form (Appendix A) based on the workshop agenda and goals. Likert scale and open-ended questions focused on usefulness of workshop activities, impact on participants, and achievement of workshop goals. The evaluation form was sent to the principal investigator for review and suggestions were incorporated.

The evaluation form was posted online at www.zoomerang.com. A link was emailed to all participants at the end of the workshop and reminders were sent to encourage remaining participants to complete evaluations.

Results of workshop evaluations were analyzed using means and response frequencies. Responses to open-ended questions about the workshop sessions were also examined to identify common themes and responses are included in the report. To assess the impact on project goals, the evaluator calculated response frequencies to goal-related items.

Section 3. Evaluation Findings

3.1 Evaluation of project components

Participants completed 5-point rating scales assessing usefulness and quality of various aspects of this workshop. Mean ratings can be considered to trend towards positive or negative based on the following scale:

Excellent   4.21 – 5.00
<mark>Good</mark>   3.41 – 4.20
<mark>Average</mark>   2.61 – 3.40
<mark>Below average</mark>   1.81 – 2.60
<mark>Poor</mark>   1.00 – 1.80

Participants' responses to open-ended questions are organized thematically after each figure.

Day 1 – Thursday, June 14, 2012

Participants (n=38) rated the usefulness of each session they attended on a scale from 1 to 5, 1=*not at all useful* to 5=*extremely useful*. One of the meeting components was rated *good* with all remaining components rated *excellent*. Mean ratings of usefulness of each component are displayed in Figure 2. Comments and suggestions for each activity follow the figure.

Figure 2. Usefulness of Day 1 PBI Statistics workshop components

Activities	Mean Rating (1-5)
9:00 Overview of project-based curriculum and resources	4.53
11:00 Work with students enrolled in the project-based course	4.05
2:00 Panel discussion with students who completed the project-based curriculum	4.26
3:30 General discussion	4.34

9:00 Overview of project-based curriculum and resources

Participants commented that the overview was well-delivered, engaging, energizing, eye-opening, useful and comprehensive. Among the suggestions were to make a hard copy of slides available and to have more detailed information about the program before hearing from the students. Participant comments are included below.

Praise

- *Extremely well-delivered in an engaging way. I loved the inclusion of students into the workshop. Excellent panel and organization.*
- *This was a nice overview.*
- *GREAT intro*
- *Really good, made me want more information and excited about it.*
- *I thought that the overview of the course was very good.*
- *Useful understanding of context.*
- *This was a very comprehensive overview and was great at infusing enthusiasm and a desire to learn more about the program.*
- *Eye opening. Helped me get the idea of what is going on in the course and of starting with what needs to be known to be useful. I see how this approach develops the ability to problem solve and think, not regurgitate.*
- *Very energizing and inspiring!*
- *I particularly like having Lisa's "brain dump" available to refer to in the future. I plan to cannibalize parts of it. I also appreciate that the iBook was emailed to us.*

<u>Suggestions</u>
- *It would have been nice to receive the PowerPoint slides to follow and take notes on.*
- *I appreciate the desire to not lecture at us too much, but I would have loved to hear all the nuts and bolts info at the beginning, to have a better understanding of the course as a whole and to ask the students appropriate questions at 11:00.*
- *Would have loved more initial grounding in syllabus*

11:00 Work with students enrolled in the project-based course

Many participants offered praise indicating, for example, that it was very useful to hear students' perspectives on the class. Some suggested that the quality of the sessions depended upon the student who presented their experience with some students offering an excellent overview, and others not being communicative or prepared enough. Among the specific suggestions were to rotate the students, offer this session after the *Nuts and Bolts* session, provide more curriculum background before this session, shorten the session, and reduce the participant to student ratio. Comments are included below and grouped by theme.

<u>Session was enjoyable and useful</u>
- *Having taught a graduate intro stats class, the work I saw was impressive.*
- *Very insightful.*
- *It was really helpful to see a sample of a students' work and development of the project. It might be interesting to see how a student goes through with the project in a typical semester. The student that I talked to had lots of difficulties with using SAS, and in understanding some of the concepts. I think it was good to see some of these challenges because project-based learning will not always work for all students.*
- *I loved hearing from a student in the middle of the course. She brought up a lot of really good issues to ponder.*
- *I think this was extremely helpful because the students were very honest. They were willing to share both what they enjoyed and the parts they struggled with and/or would improve.*
- *Engaging student who was clearly engaged in his research question and coherently analyzing the data he was working with.*
- *It puts the entire curriculum innovation in a deeper perspective.*
- *This was very nice. Good alternative perspective.*
- *Having a chance to see the students going through the course was helpful. It let us see more about how the course works and also get student feedback before we try to implement the course (or pieces of it) at our own institution. The pros and cons about the course that the students mentioned will be very helpful.*
- *I enjoyed Ryan. He's a cool student. I wish him the best.*
- *Provided a great view of students in the process*
- *It was nice to be able to talk with the students and ask them questions about their experiences.*

<u>Student selection impacted effectiveness</u>
- *The effectiveness of this session may have varied depending on the students each group worked with. In addition to discussing her experience, our student showed us her codebook and code, the syllabus and course schedule, and several of her submitted homework assignments. These materials gave me an excellent overview of the course and clarified a number of details.*
- *Our student seemed put off by <u>us</u>. To the student's credit, some of the faculty were asking him/her really obnoxious nit picky questions.*
- *One of the two students in my group did not seem very prepared to talk about his project.*
- *The student we met with was somewhat lost which was expected. However what may have been unusual is that she has had previous research experience and therefore was familiar with the process of conducting research (though she was completely new to the analyses)•   Good idea. the student that i worked with was not very dynamic. i tried to ask questions about the class, about his curiosities about the data set, about what he has found so far and how he got there, and where he would like to go next with the data, but after a while, it was like pulling teeth. he was a nice person, just not a conversationalist. this component was a good idea and it looked like the other groups had some good*
- *The particular student that my group was assigned to was not that communicative. Perhaps we could rotate and talk with a few students*

<u>Suggestions for improvement</u>
- *It was a little difficult to hear and interact with the student since there were four of us talking to one student. It was difficult for us to all see her computer screen.*
- *Liked, if students would have more of a guide of how to walk us through what they have been doing. For example, tell them to start from the beginning and explain. This way there is not so much jumping around.*
- *I felt we didn't need the entire hour.*
- *Maybe better to do this after Nuts &Bolts.*
- *I really enjoyed the 3:1 time with a student enrolled in the course, which was invaluable. It was only "somewhat useful" because it seemed the folks in the workshop were still trying to work out exactly what the course is and what the curriculum consists of. The student did an exceptional job, but if we had more background on the curriculum before these breakouts I think they'd be more effective.*

2:00 Panel discussion with students who completed the curriculum

Most participants offered positive comments about the panel discussion. Their comments indicated it was informative, interesting, and useful. They found the students' responses insightful and enjoyed hearing what the students learned. Among the suggestions for improvement were to have fewer students on the panel and preparing students prior to the panel with questions to think about. Another wondered whether the panel was representative of those who took the course. Their comments are included below.

<u>Session was informative, interesting, and useful</u>
- *The comments were frank and insightful.*
- *I was extremely impressed by the excellence of the students and their ideas.*
- *Although this was not a representative sample, the students were very impressive and it was nice to hear about their positive experience with the project.*
- *It was great hearing how excited students were about this course. They didn't seem to have any of the typical criticisms that you find in "typical" introductory stats courses. Color me intrigued...*
- *Very insightful!*
- *To hear how the students were using the knowledge gained in the course was extremely inspiring, but probably more useful was when they talked about their experiences TA'ing since that gave a better idea of the full range of student problems, etc.*
- *Interesting*
- *It gave a sense of usefulness and effectiveness of the program.*
- *Very interesting. Another good alternative perspective.*
- *This discussion section was great, especially following the discussion with the currently enrolled students. We were able to see that QAC 200 is a course that students end up appreciating if not in the moment, then definitely after the fact. As instructors, we want students to be able to get more out of the class then just content and QAC 200 is something that students can apply way beyond the classroom.*
- *Most interesting portion of the program. Students were candid and clearly benefited by the project-based approach.*
- *I was amazed at how articulate and literate they were. They had tremendous confidence in their abilities.*
- *This was fun. I liked seeing how the skills transferred to other classes. I think this is a major selling point for me. I love the idea of preparing students to think and act and develop their own questions and ideas independently... and also to feel able to explore those questions and to know how to go about doing that.*
- *It was informative to hear that enthusiasm that the students had for the course, particularly their confidence in moving further with this material in the future*

<u>Suggestions for improvement</u>
- *The panel was perhaps a bit too big but the information was generally helpful. It was during this session that I really began thinking about the possibilities for implementation in my classroom.*
- *I think perhaps fewer students would have been better. During the intro, many of them were sounding similar. Also adding a few pre-specified questions may assist in moving things along..*
- *Still getting a handle on exactly what the approach is at this point.*
- *Maybe prompt students with possible questions to think about prior to coming*
- *I don't think the students were representative. Did anybody actually hate the program?*

3:30 General Discussion
Participants made positive comments about the general discussion. Many expressed appreciation for others' questions and ideas and the opportunity to discuss and gain new ideas for the course.
- *I liked hearing others' questions and having a chance to ask my own, after being exposed to the course.*
- *I liked having this time to hear other people's questions and know that I was not the only one working out how I'd have to change it to make it work for me.*
- *Nice to have time to troubleshoot and discuss ideas and where we were currently.*
- *This had some interesting tidbits, but got a little "bombarding" at times. Lots of ideas bouncing around, etc.*
- *I honestly don't remember the general discussion that much so my rating of a 3 may not be accurate. I think I got useful information out of that session.*
- *Thoughtful commentary by seasoned faculty.*
- *Helpful to ask questions of the students and QAC faculty together*
- *Good for reflecting. Good for getting ideas or ideas for ideas to explore further.*

Day 2 – Friday, June 15, 2012
Participants rated the usefulness of each session they attended on a scale from 1 to 5, 1=*not at all useful* to 5=*extremely useful*. The majority of components were rated *good* with two components rated *excellent.* Results from each session are displayed in Figure 3. General comments and suggestions for each component follow the figure. The number of people who attended each break-out group is included in the figure.

Figure 3. Usefulness of Day 2 PBI Statistics workshop components

Friday, June 15, 2012	Mean Rating (1-5)
9:00 Overview (n=17)	4.29
Carnegie Melon University, Open Learning Initiative (n=5)	4.20
University of Minnesota, Catalyst Program (n=13)	3.85
R statistical software training (n=5)	4.20
Shared resources and collaboration across institutions (n=3)	4.67
11:00 Discussion and Wrap-up (n=33)	4.06

9:00 Overview
Participants had many positive comments about the overview presentation. Many indicated that it was very helpful and several noted it was the most useful of all sessions. Among the suggestions were to slow down the pace, make this the initial session, and to provide a syllabus. Their comments are included below.
- *Most useful to go through curriculum step by step.*
- *It was helpful to see the overview of the chapters.*
- *I found this to be INCREDIBLY helpful, and it looked like we had about 40-50% of the attendees in this ad-hoc breakout group. My suggestion would be to do this with the whole group immediately after the Introduction/Overview at the start of Day 1.*
- *There was a bit of a frantic pace to the session. I think it could have been improved by slowing down just a bit, or having more time for the session.*
- *Lisa handled questions amazingly. Attendees showed a significant lack of creativity/initiative/imagination in their questions-- drove us too far from breakout intention.*
- *I felt like I really got a better feel for how I could incorporate (maybe not all) but some of the different curriculum into the classroom and use the iBook.*
- *This was very helpful. For the future, I think the first session on Thursday could be this presentation.*

- *This was actually the Nuts & Bolts session. It gave me what I was really looking for, the kinda of day to day workings. I think if the start was a conversation about let's not argue when and how things should be taught. Let's focus on how we do it and then another time we can discuss how you think you would do it.*
- *I thought this was the best part of the workshop. It helped me to see a lot of the inner-works.*
- *Most informative session of the two days.*
- *The handouts were great -- I wish I had a syllabus, too, but I can get that over email.*
- *I found this a repeat of what I heard before.*
- *This was SO important. It solidified everything we had been discussing.*

Break-out Groups

Carnegie Melon University, Open Learning Initiative

Participants commented that the session provided an in-depth understanding of the course and that the instructor well-prepared:

- *Nuts & Bolts. Provided in-depth understanding of the week to week structure of the course.*
- *This really gives me more confidence of doing it. This is the one changed.*
- *The R session was fabulous. The instructor was so well prepared. I now have code I can take home and get started with R myself.*

University of Minnesota, Catalyst Program

Participants offered largely positive comments about the Catalyst program. Several mentioned that their own students would need more detailed knowledge of statistics. A couple questioned the usefulness of the Tinkerplots. Participant comments are included below.

- *Lots of ideas to work with! A thorough introduction to the program. We worked through several actual course activities which was excellent.*
- *Catalyst - I wouldn't be able to change my course to incorporate the whole program, but could use some parts of it.*
- *I like the idea of randomization tests in intro stats. Tinkerplots seems a little too "high school-ish". I may try these techniques using R in my class.*
- *I attended the Catalyst break-out group and thought that it was interesting.*
- *I like the idea of focusing on statistical reasoning, but our students definitely need more detailed content to run their own experiments in future courses. Working with a standard statistical package is also critical for our students to take that knowledge into future courses, I don't see the TinkerPlots being useful at all.*
- *This was a nice introduction to another approach to teaching statistics. Not sure exactly how useful, as many stats students are REQUIRED to know certain topics. Tough to introduce this to a service course.*
- *I didn't understand the purpose of the Catalyst Program. That is, I didn't understand what it was designed to teach students. It's clear what the QAC 200 course does. I just didn't get Catalyst.*
- *I caught the back end. I couldn't be in two places at one time.*

R statistical software training

Most participants commented that this provided a useful introduction to R that was sufficient to launch more learning of the software. Two participants would have preferred more detailed information, one of which also expected a more elementary presentation of R. Participant comments are included below.

- *Very well done on the basics of R. I would suggest having more comments in the code that explain what each part of each command does. Also, a list of good resources for future reference would be helpful.*
- *Attended the R workshop and expected a more elementary presentation for individuals who never used R or had any interaction with R. Would have preferred an information on how to get R of the ground and running i.e. entering data*
- *R presentation was a great introductory lecture that could lay basis for more self-tutoring in R.*
- *I went to the R break-out session. I learned more in 30 minutes than I had in the past decade. I never used R before but had a background in SAS, SPSS, Minitab, and Matlab. Once you learn the syntax, R is pretty simple to learn.*
- *It was fun. I feel ready to go home and start working through some basic R on my own.*

<u>Shared resources and collaboration across institutions</u>
Only one participant offered a comment about this break-out group:

- *I'm not sure that putting the final session after the break-out sessions was the best timing. I think it would have been nice to do the breakouts Thursday afternoon and then one of the student panels on Fri morning. I think we had a more lively discussion and thought process to sum things up after hearing the students' perspective.*

11:00 Discussion and Wrap-up

Many participants offered positive comments about the discussion and wrap-up indicating that it covered some important logical issues and provided additional data. In terms of facilitation of the discussion, many praised the presenter and described her as energetic and enthusiastic. A number of participants also mentioned feeling optimistic after the session. A couple found the discussion a little disorganized. Participants' comments are included below by theme.

<u>Information and logistics</u>

- *Loved the additional information on data set sources. Appreciated the valuable advice regarding the incremental administration of the concepts in our individual's schools.*
- *All of my questions were answered prior to attending this session. However, I thought it was very useful to have such a candid discussion about logistic issues. It sounds to me like it would be helpful to disseminate more information about the statistics education world to this group of people (e.g. the CAUSE website, the Harvard happy course, the various conferences available, and the various journals available).*
- *I'm really interested to see how this would work in a nontraditional setting with working adults.*
- *We discussed some important logistical issues*
- *Nice to share resources and ideas as well as hear how we can help each other as well as the QAC..*

<u>Facilitation and format</u>

- *Am very impressed by Lisa's energy level and ability to engage the group.*
- *It tied everything together nicely.*
- *I thought the discussion was a little disorganized. I think it could have been more useful if there was a little more organization. At times it just seemed to be rambling.*
- *More time should be spent on discussing & talking though application of the course in differing contexts.*
- *This was also interesting, but a little unstructured. Dr. Dierker is enthusiastic and dynamic, but I felt again like topics were being suggested right and left, and felt a little bombarded. More a difference in personality, though. She did a great job. Thanks for an inspiring couple of days!*
- *It was nice to finally hear about the GAISE guidelines. I think that it should have been mentioned at the beginning.*

<u>Improved optimism</u>

- *Uplifting pep talk for those of us looking forward to trying this innovative method.*
- *Left me feeling optimistic and inspired and trying to think about what I will be doing with my courses and what they could look like in 3 to 4 semesters from now.*
- *Good to hear the enthusiasm and questions that participants had. I got ideas of other resources from their comments.*

Additional topics suggested

Participants were asked if they would have liked to see additional concepts covered during the workshop. The majority of the respondents (70%) replied *no*. Those who responded *yes* made the following comments and suggestions about organizing participants by discipline, workshop content and scheduling, and teaching applications:

Organizing participants within similar disciplines for networking

- *It would likely be helpful to spend about an hour working with a small group of people from the same discipline and similar institutions discussing the logistics for implementation in our courses. Just an alternative form of brainstorming to help make things concrete.*
- *Would have loved one session where people could connect with those in their disciplines or larger disciplinary areas (interdisciplinarity is great but I'm uninterested/depressed by debates among Math faculty, for example, about whether or not project-based learning is 'legitimate' or 'successful.' I have seen this WORK in teaching Qual methods in SOC so I want to jump into it with Quant and start from a place of "CAN" rather than "CAN'T."*
- *I think it might be interesting in the future to have a break-out session early on where people divide by disciplines. That way we could establish connections early with people in similar situations.*

Workshop content and scheduling suggestions

- *There might be a benefit to expanding the ad hoc discussions related to identifying, evaluating and obtaining data sets.*
- *I was looking forward to the grant writing or looking for funding that was originally in the schedule.*
- *It would have been nice to have some student posters up and have those students present to the group or at least be available to answer questions.*
- *There was discussion of including a workshop about how to adapt the project-based learning model to different situations (and a lot of discussion in the wrap-up). I wish we had been able to discuss it more, and I would've been willing to stay a bit longer to do so (though, I realize that it is desirable to be finished before lunch!)*

Teaching applications for workshop topics

- *How the curriculum connects with educational theory.*
- *How to incorporate for larger classes.*
- *More on tailoring the pedagogy into different venues and populations.*
- *I think a time set aside for talking with the instructors who have taught it and their experiences would be interesting and helpful. Also, a time to discuss the resources that we each use in our classrooms often would be useful.*
- *I would be interested to hear ideas about adopting projects in statistics vs. research. methods courses. However, this focus may only be relevant for some disciplines.*
- *How did you choose your data sets? A visual map of the statistical methods you teach, showing the order., you cover many higher level topics and I am curious how you explain the foundation underlying the methods (e.g. Logistic regression).*
- *I would have liked to see a "typical" day of material in the middle of the course when the students are learning about types of analysis. I would be curious to see how ideas like confidence and sampling distributions are covered in this approach.*

Miscellaneous

- *How young faculty can return to an institute and help bring Lisa's enthusiasm to senior faculty members.*
- *There is plenty to chew over. More may be overwhelming.*

Quality of speakers and facilitators' presentations and discussions

Participants rated the quality of speakers on a scale from 1 to 5; *1=poor* to *5=excellent*. All aspects in regard to the speakers and facilitators were rated *excellent*. Participants' mean ratings of the quality of the session facilitators and speakers are presented in Figure 4. Comments about the speakers and facilitators were very positive, and follow the figure.

Figure 4. Respondents' ratings of quality of session facilitators and speakers

Evaluation of Workshop Presentation (n=38)	Mean Rating (1-5)
Speakers' preparedness and organization	4.74
Speakers' ability to convey information in an understandable manner	4.71
Speakers' ability and responsiveness to answer questions to your satisfaction	4.71
Discussion leaders' ability to facilitate discussions	4.58

All respondents offered positive comments about the speaker with many praising her enthusiasm and speaking skills. Among the suggestions for improvement were to have the materials available earlier to allow participants to print them out and spending more time on how the course can be extended to different contexts.

Praise
- *Clear and enthusiastic in delivery.*
- *This was a fantastic day; I wish I could stay for the second day of the workshop.*
- *Made me want to join the revolution and change the way statistics is taught.*
- *Lisa's presentation was very informative, inspiring and helpful. Her presentation has inspired me to try a try a modified version of this in my class this fall.*
- *Everything was well-presented: very clear and speakers were willing to be open to all questions at any time, and they covered the right amount of material.*
- *Overall, well done.*
- *Lisa is a really good presenter. She's an amazing speaker, and very inspirational.*
- *Excellent. Very well done, and I'm leaving the workshop inspired to implement the curriculum at my home institution.*
- *Lisa D is phenomenal. Approachable, informed, quick, demonstrates great integrity.*
- *I thought everything went very well. I like Lisa's enthusiasm about the course and about teaching statistics.*
- *Lisa was amazing! The success of this program at Wesleyan clearly has a great deal to do with her attitude. She was very inspiring to me, and I hope I can convey her enthusiasm to the other faculty members in the Mathematics department when I return to my institution.*
- *I really enjoyed Lisa's enthusiasm and her kind way of responding to questions and input.Lisa is simply a remarkable presenter, an instructor's instructor!*
- *Lisa is fantastic!*
- *Lisa's energy and presentation style was fantastic. She not only kept us completely engaged but managed to convey tremendous amounts of information in a limited time.*
- *I was never in doubt of the authenticity or preparedness.*
- *Informative and engaging.*
- *Lisa brings so much energy to her presentation that she is very engaging to listen to. She answers questions thoroughly and communicates genuinely.*
- *Lisa definitely inspires one to be very reflective about their own statistics courses and energizes one to try new things!*

Suggestions for improvement
- *Good. I just wish we would have had the presentation materials earlier so I could print them out.*
- *Overall, it was exceptional. Sometimes question askers had a difficult time finishing their questions though before the speaker interrupted.*
- *Generally good. But a lot of time was spent emphasizing how great everything was, and that time could have been used to think through extending this course into differing contexts. I think many participants are concerned about their own situations, and less concerned about how this course has worked at Wesleyan. More focus on extrapolation would probably help assuage many concerns.*
- *Speaks too fast and tends to get off topic.*

Participants' rated the difficulty of information presented during the workshop from 1 to 5; 1=*extremely easy* to 5=*extremely difficult*. The overwhelming majority of participants rated the level of difficulty as just right. No one said it was too difficult. Participant ratings are shown in Figure 5.

Figure 5. Level of difficulty of workshop information
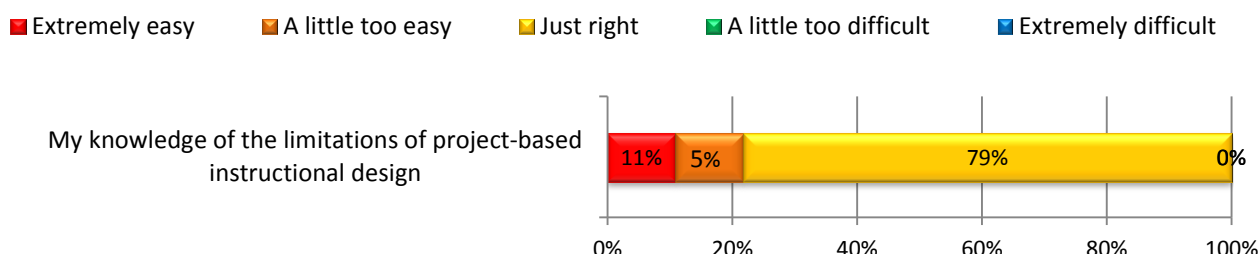
Satisfaction with workshop logistics

Respondents' rated their satisfaction with the logistics of this workshop on a scale from *1=low* to *5=high*. Their ratings are presented in Figure 6. Respondents rated all but the refreshments in the *excellent* range. Accommodations, time of year, and atmosphere were among the highest rated and refreshments was rated the lowest.

Figure 6. Respondents' ratings of meeting logistics
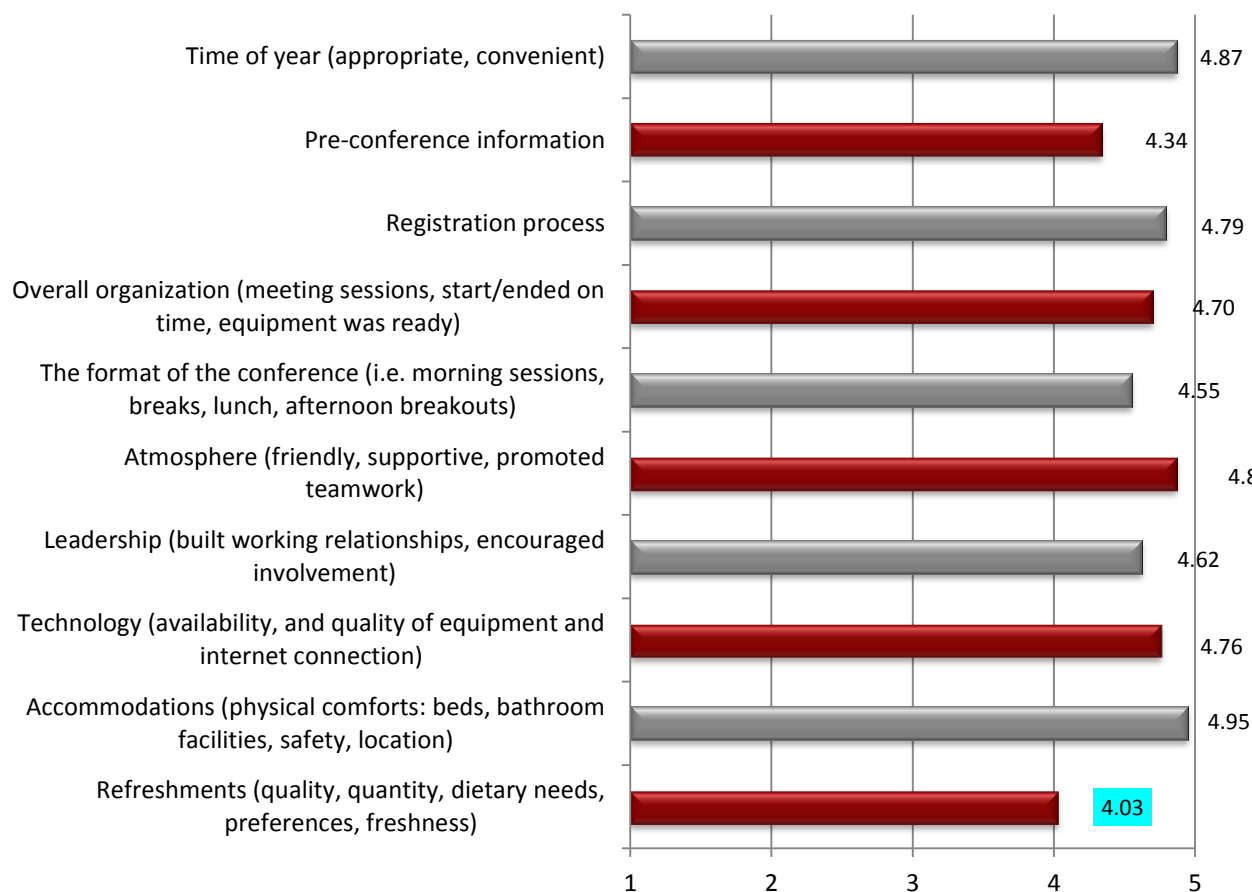
Many of the participants had no suggestions for improvement in workshop logistics and offered compliments to the organizers. Other participants provided various recommendations to improve the refreshments and format of the workshop which are included below.

Praise
- *I think the workshop was highly successful. It was one of the best if not the best I've attended.*
- *The inn was lovely and the meal stipend allowed us to eat nicely.*
- *I though this conference was very well organized! I liked that we had small tables at dinner the first night so we could interact well with a small subgroup of people.*
- *This was a fantastic workshop.*
- *No particular! It is good.*
- *No real improvements required.*
- *Not that I can readily think about.*

Suggestions for refreshments and food
- *Fresh fruit at coffee breaks would be nice.*
- *Water in addition to coffee and tea.*
- *I would have liked if breaks had some sort of snack, cookies or some such.*
- *Would rather have had some catering rather than the generous per diem. Was SO HUNGRY during the day and the vending machines didn't have any items. Felt somewhat trapped by lack of refreshments within manageable distance from the building.*
- *Coffee supply ran low!*
- *Perhaps having bottled water available during the snack breaks would be useful or inform participants to bring their own water.*
- *Bring food for snacks. I am starving right now.*
- *Always appreciate refreshments!*

Format of the conference
- *Maybe break into smaller groups by area of interest in the different challenges or themes in problem-based learning. For example, I would be interested in joining a group about developing research questions.*
- *I was very impressed with the organization of this workshop before my attendance. Looking back, it may have been nice to try to group people according to their background (e.g., psychologists), but people could clearly do that on their own after the initial introductions.*
- *If there were more opportunities for group-up groups that would have been better. There were people including me who were interested in more than one group and had to choose one to actually go.*
- *May be nice to have some more directed documents before the workshop. I didn't have a good sense of how the class worked before I got there. (I didn't realize the Moodle site would have all the material.)*
- *I would have like to get a better sense of the curriculum before I came to the conference. For example, the type of information that was discussed in the nuts-and-bolts break out session.*
- *Maybe a mass email prior to the arrival to coordinate taxi sharing from the airport.*

Participants' rated the likelihood that they would recommend this workshop to a friend and that they would attend another workshop similar to this one in the future on a scale from 1 to 5; *1=not likely at all* to *5=extremely likely*. The majority rated these areas *very* or *extremely likely*. Mean ratings are presented in Figure 7 and suggestions and compliments follow the figure.

Figure 7. Likelihood of recommending the workshop or attending similar one in the future
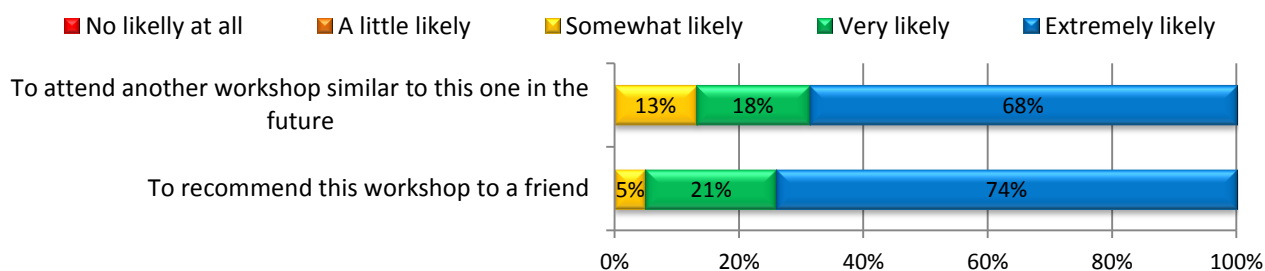
Participants' praise and suggestions for the workshop are included below.

<u>Praise</u>
- *Really appreciate all the opportunities to interact with each other.*
- *Thank you so much for all you've done to make this workshop such a success.*
- *This conference was great. I will take the ideas I learned here back to my school. I am very interested in continuing the relationships established here with Wesleyan U. and the attendees.*
- *I really want to come back and reconnect next summer to discuss how it went!*
- *Overall, I thought the conference was great. The people who attended were all very easy to talk to. I thought the preconference dinner was a great idea because it gave us all a chance to start interacting even before the conference started. I thought the open lunches was good as well so that different groups of people were able to continue their conversations and people were able to pick whatever they wanted to eat. I think more organization for the closing discussion would be great. It was a good conference that to me seemed to start with a bang and fizzle at the end.*
- *I would be thrilled to actually attend the summer course! When I get home, I plan to work my way through the online text, but I wish that we could've had a sort of "sample class" and work with some data.*

<u>General suggestions</u>
- *Distance from airport, and size of airport, made this a very expensive trip (~$700 for flight + ground transport). Doing this course nearer to a major airline hub, and closer to the airport, would help with costs not covered by the workshop*
- *Having some kind of tool to keep network for people who participated in the workshop. For example, one workshop I went to for another topic has a Facebook page for workshop alumni for future communication or information exchange among alumni*
- *As noted above, making the "nuts and bolts" of the course curriculum a formal component of our curriculum would be quite helpful, in my estimation. In addition, while it wasn't a concern of mine, it does seem that there was a fair amount of concern about how "portable" the curriculum is to institutions that differ from Wesleyan. I don't think this concern requires a major change, but it may be a direction to think in for the future*
- *No need for a hard cover notebook for the materials. A simpler folder or stapled document would be fine. Availability of the documents online is appreciated! Thank you!*
- *Workshop was excellent, one minor suggestion might be to have a dinner with the whole group on Thursday night, in addition to Wednesday night. That would provide more of an organized opportunity to meet people at the workshop*
- *I would include the "nuts and bolts" as part of the general program. If possible - perhaps some or all of an actual class could be attended*
- *Inviting one or two students who really struggled in this class to be panelists*
- *I would be extremely interested in attending a workshop that went more in depth of the day to day, grading, etc. to really get a good grasp.*

3.2 Effectiveness of meeting project goals

Participants answered a series of questions to assess the impact that participation in the workshop had on them and how well the workshop achieved its intended goals. Response frequencies to those items are presented for each goal area.

> ### Goal 1 – Increase participants' knowledge of principles, pedagogy, merits, and limitations of project-based instructional design.

Respondents rated how well they believe this meeting increased their knowledge of principles, pedagogy, merits, and limitations of project-based instructional design on a scale from 1 to 5; *1=not at all* to *5=a great deal*. Between 55% and 89% of participants reported *a good amount* or *great deal* of impact for all categories. "Increased knowledge of principles of project-based instructional design" was rated the lowest in that only 55% of participants rated a *good amount* to *great deal* of gain. "My knowledge of the limitations of project-based instructional design" was rated the highest with 89% noting a *good amount* to *great deal* of gain. Results are shown in Figure 8.

Figure 8. Respondents' rating of knowledge of project-based instructional design
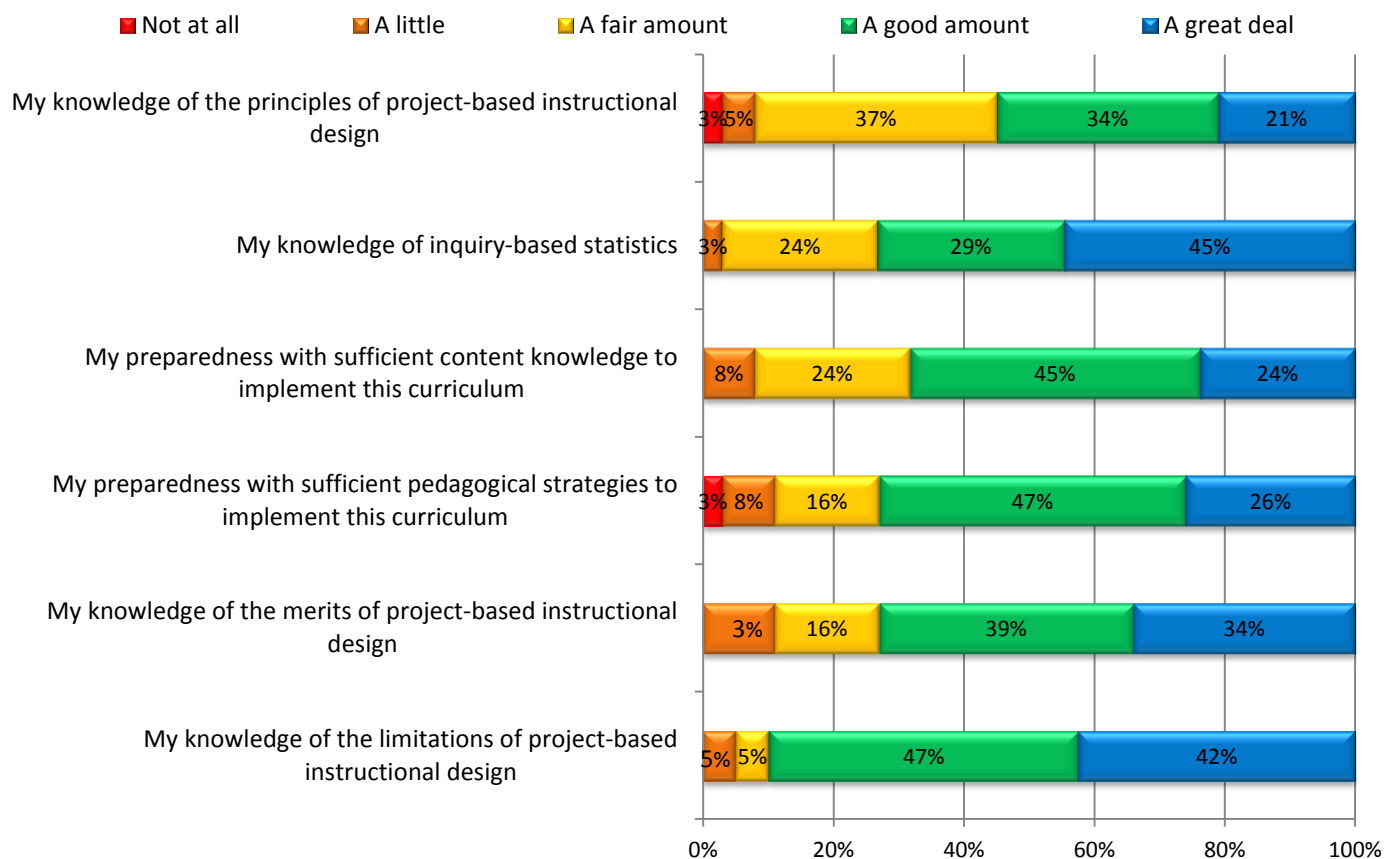
Respondents rated their likelihood of implementing various project-based course features in their own statistics courses on a scale of 1 to 5; *1=not likely at all* to *5=extremely likely*. Respondents who indicated they already implement a feature did not complete the rating, therefore the number of respondents for each item varies. An overwhelming majority reported being *very or extremely likely* to allow students to choose their own research questions based on existing data and use large real-world data sets. However, a considerable percentage indicated they would not use syntax-based software, present and practice with multivariate tools, and use syntax translation across more than one software program. Results are shown in Figure 9.

Figure 9. Respondents' rating of likelihood of incorporating PBI features into instruction[3]

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[3] Sample size for each item indicates the number of respondent who had not used that feature prior to the workshop.

Respondents also indicated how likely they were to incorporate various PBI resources into their instruction on a scale of 1 to 5; *1=not at all likely* to *5=extremely likely.* Results varied greatly. At least 60% of respondents indicated it was *very or extremely likely* that they would incorporate statistics writing models, lecture clips, Open Learning Initiative, and iBooks. Thirty-eight percent reported *not likely at all* or *a little likely* to incorporate Catalyst resources and half indicated it was *not likely at all* or *a little likely* they would implement translation syntax across four statistical software packages. Results are shown in Figure 10.

Figure 10. Respondents' rating of likelihood to incorporate resources into instruction
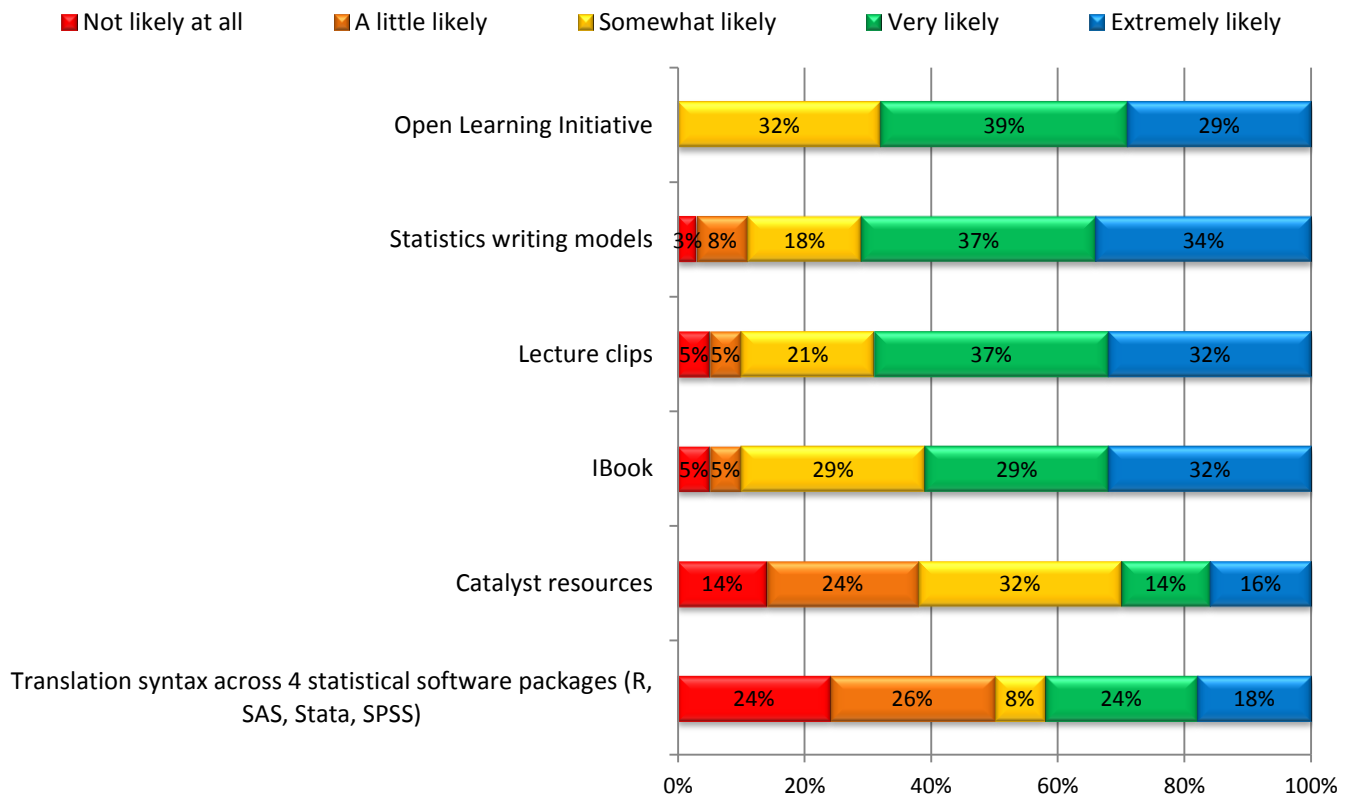
Respondents rated how much their knowledge of interdisciplinary opportunities for teaching introductory statistics increased on a scale from 1 to 5; *1=not at all* to *5=a great deal*. The majority of participants indicated having *a good deal* or *great deal* of increase in knowledge of opportunities for all but one of the five items. Their knowledge of how to work with their department to develop a statistics course with other departments was more mixed in that more than one-third reported being *not at all* or only *a little* more knowledgeable. Results are shown in Figure 11.

Figure 11. Respondents' rating of networking and sharing resources for introductory course
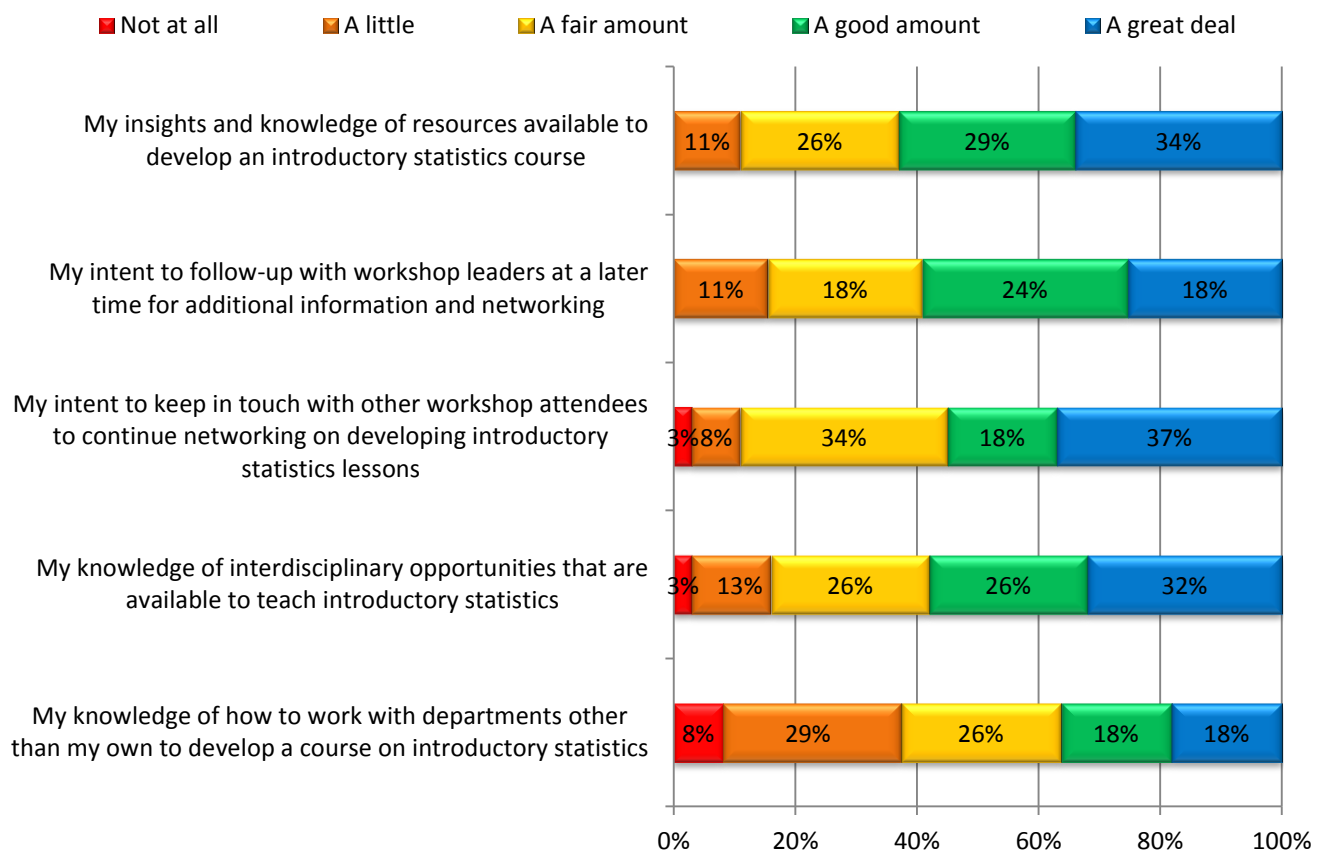
Respondents rated the likelihood of recommending the project-based approach to others at their institution who are responsible for decision making about statistics curriculum on a scale from 1 to 5; *1=not at all* to *5=extremely likely*. Responses were favorable, with a majority rating all items as *very or extremely likely*. However, one-third do not intend to talk with an administrator at their institution about PBI statistical approaches. Results are shown in Figure 12.

Figure 12. Respondents' rating of likelihood of recommending a project-based approach

Legend: ■ Not likely at all   ■ A little likely   ■ Somewhat likely   ■ Very likely   ■ Extremely likely

Statement	Not likely at all	A little likely	Somewhat likely	Very likely	Extremely likely
I will talk to other instructors in my department about the merits of the project-based approach to teaching statistics	3%	3%	3%	16%	76%
I will talk to my department chair about the merits of the project-based approach to teaching statistics		11%	8%	19%	62%
I will talk to instructors in departments other than my own about the merits of the project-based approach to teaching statistics	5%	18%	21%	24%	32%
I will talk to administrative personnel at my university about the merits of the project-based approach to teaching statistics	13%	18%	18%	21%	29%

Goal 5 – Participants are motivated to submit a proposal to develop, implement, and/or assess project-based statistics curricula.

Respondents rated their likelihood of submitting a proposal to develop, implement, or assess a project-based statistics curricula on a scale of 1 to 5; *1=not likely at all* to *5=extremely likely*. About forty percent indicated it was at least *very likely* they would submit a proposal, however, about a third indicated it was *a little* or *not likely at all* that they would do so. Results are shown in Figure 13.

Figure 13. Respondents' rating of likelihood of submitting a proposal

■ Not likely at all ■ A little likely ■ Somewhat likely ■ Very likely ■ Extremely likely

	Not likely at all	A little likely	Somewhat likely	Very likely	Extremely likely
I will submit a proposal to develop project-based statistics curricula	8%	32%	13%	29%	18%
I will submit a proposal to implement project-based statistics and curricula	5%	29%	13%	29%	24%
I will submit a proposal to assess project-based statistics and curricula	13%	21%	26%	21%	18%

Section 4: Key Findings and Recommendations

1. Demographics
The majority of the attendees were female (58%) and Caucasian (73%). There were no Hispanic/Latino or American Indian/Alaskan Natives in attendance. The overwhelming majority (89%) were not from institutions that serve large under-represented minority groups.
Continue efforts to increase the number of minority participants by reaching out to faculty at institutions that serve large under-represented minority groups.

2. Formative components
All components from the workshop (Day 1 and 2 activities, speakers, meeting aspects) were rated *very good* to *excellent* and participants offered a great deal of praise for the speakers, reported the sessions were enjoyable, useful, and even inspiring. Some commented that the quality of student comments and feedback varied, with some students seeming less conversational or prepared. Among the suggestions was to have the *Nuts and Bolts* session earlier and to offer access to powerpoints of the sessions. Participants offered a number of specific suggestions about the content, format and logistics of the workshop.
Project staff should review participants' comments in this report to identify suggestions that would be beneficial to improve this already well-received workshop.

3. Goal 1: Increase knowledge of project-based instructional design – Overall, the majority of participants indicated that their knowledge of project-based instructional design increased a *good amount* or a *great deal*. Their growth in knowledge of the principles of project-based instructional design showed the lowest proportion of increases.
Consider increasing the amount of coverage of the principles of project-based design in the sessions offered.

4. Goal 2: Plan to utilize features from the curriculum and implement in their instruction – Almost half the participants indicated it was *very likely* or *extremely likely* they would use all features except "syntax translation across more than one software program, presentation and practice with multivariate tools, and infrastructure for unlimited one-on-one support." The majority of participants were *very* or *extremely likely* to incorporate most of the resources into their instruction. The two categories participants reported *not likely at all* or *a little likely* that they would include were "translation syntax for statistical software programs (R, SAS, Strata, SPSS) or Catalyst resources." Participants had reported in previous responses that the Catalyst program did not provide the basic information that their students needed.
Identify ways that syntax translation, multivariate tools, and infrastructure for unlimited support can be incorporated into instruction. Discuss the issues associated with incorporation of these tools into instruction with workshop participants. Consider more specific coverage about how the resources of the translation syntax for statistical software programs and the Catalyst program could be useful to participants and how it can be incorporated into instruction. In future evaluations it would be valuable to find out why participants are less interested in incorporating these features and resources into their instruction. Is it a resource issue? Are they concerned it is to challenging for their students?

5. **Goal 3: Identify interdisciplinary opportunities to incorporate PBI statistics –** At least half of the participants reported *a good* to *a great deal* of increase for all the categories, except "knowledge of working with departments other than their own to develop an introductory statistics course," in which 37% of participants listed *not at all* or *a little.*
Intuitional challenges may interfere with interdisciplinary course development. Consider discussing and presenting participants with examples of how institutional barriers have been addressed and overcome. Hearing about how interdisciplinary linkages have been forged at other institutions and providing some specific suggestions for how to pursue such relationships may encourage participants to pursue them at their home institution.

6. **Goal 4: Recommend the project-based approach to others who are responsible for decision making around the statistics curriculum –** At least half of the participants rated being *very* or *extremely likely* to approach others, with at least 80% reporting they would talk to other instructors in their department as well as their department chair. The highest percentage of responses of *not likely at all* or *a little likely* was reported for talking to administrative personnel (31%) and instructors in other departments (23%).
Similar to the recommendation for Goal 3 above, participants may need specific guidance, in the form of examples and advice for how to approach faculty and administrators outside their department. Hold discussions about these issues with participants.

7. **Goal 5: Be motivated to submit a proposal involving project-based statistics curricula**
Participants gave mixed responses about whether they would develop, implement, or assess project-based statistics curricula. While there were more positive responses than negative, many respondents indicated they were *not likely at all* or *a little likely* to develop (40%), implement (34%), and assess (34%) project-based statistics and curricula.
In future evaluations, adding open-ended comment responses following the Likert-scale will allow participants to explain the impediments that prevent them from developing, implementing, and/or assessing the project-based statistics course and curricula. It may be those faculty do not feel empowered to make decisions about curriculum issues in their departments or universities. If that is the case, this poses a significant barrier to dissemination of the course. One way to address this is to help empower faculty by showcasing more models of course proposals and, offering specific advice for developing and promoting them at their institution. Hold discussions about these issues with participants.

Appendix A: PBI Workshop Evaluation Form
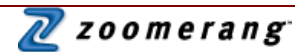
Page 1 of 5
About You: Completion of this section provides basic information to capture the demographics of Wesleyan workshop participants. This information is needed to report to the grant funders and it also strengthens future funding applications.

Page 1 - Question 1 - Choice - One Answer (Bullets)

With which gender do you identify?

○ Male
○ Female

Page 1 - Question 2 - Choice - One Answer (Bullets)

With which ethnicity or racial background do you most closely identify?

○ African American or Black
○ Asian
○ Caucasian or White
○ Hispanic or Latino
○ American Indian or Alaska Native
○ Native Hawaiian or Other Pacific Islander
○ Other, please specify

Page 1 - Question 3 - Choice - One Answer (Bullets)

With what type of institution are you primarily affiliated?

○ 2-year institution
○ Bachelor's degree granting institution
○ Master's degree granting institution
○ Doctoral degree granting institution
○ Nonacademic organization
○ Other, please specify

Page 1 - Question 4 - Choice - Multiple Answers (Bullets)

Does your institution have any of these designations? Mark all that apply

❑ Historically Black College
❑ Institution with high Black or African American Enrollment (non-Hispanic) (25% or more)
❑ University American Indian Tribally Controlled College or University
❑ Institution with high American Indian or Alaska Native Enrollment (25% or more) – Not Tribally Controlled
❑ Institution with high Hispanic Enrollment (25% or more)
❑ Institution with high Native Hawaiian or Other Pacific Islander Enrollment (25% or more)
❑ Institution with high Disabilities Enrollments (>3% of Undergraduates)
❑ None of these

What is the primary discipline(s) in which you teach?

- ○ Earth & Environmental Science
- ○ Education
- ○ Math and/or Statistics
- ○ Political Science
- ○ Psychology
- ○ Sociology
- ○ Other, please specify

What is your position for the 2012-2013 academic year? (Mark all that apply)

- ❑ Graduate student
- ❑ Postdoctoral fellow
- ❑ Instructor (assistant, associate, full professor)
- ❑ Academic administrator (Chair, Dean, etc.)
- ❑ Other, please specify

Page 2 of 5
Evaluation of Workshop Components
Please rate each of the following activities of this workshop on a scale of 1-5; 1 = not useful at all, 5 = extremely useful and comment on the activities in the area provided.

Thursday, June 14, 2012

	Not at all useful	A little useful	Somewhat useful	Very useful	Extremely useful	Did not attend
9:00 Overview of project-based curriculum and resources	○ 1	○ 2	○ 3	○ 4	○ 5	○ Did not attend
✍ Additional Comme						
11:00 Work with students enrolled in the project-based course	○ 1	○ 2	○ 3	○ 4	○ 5	○ Did not attend
✍ Additional Comme						
2:00 Panel discussion with students who completed the project-based curriculum	○ 1	○ 2	○ 3	○ 4	○ 5	○ Did not attend
✍ Additional Comme						
3:30 General discussion	○ 1	○ 2	○ 3	○ 4	○ 5	○ Did not attend
✍ Additional Comme						

Friday, June 15, 2012
9:00 Break-out Groups – Please rate the usefulness of the breakout groups you attended.

	Not at all useful	A little useful	Somewhat useful	Very useful	Extremely useful	Did not attend
Carnegie Melon University, Open Learning Initiative	○ 1	○ 2	○ 3	○ 4	○ 5	○ Did not attend
✍ Please comment on this break-out gro						
University of Minnesota, Catalyst Program	○ 1	○ 2	○ 3	○ 4	○ 5	○ Did not attend
✍ Please comment on this break-out gro						
R statistical software training	○ 1	○ 2	○ 3	○ 4	○ 5	○ Did not attend
✍ Please comment on this break-out gro						

Shared resources and collaboration across institutions   ◯   1   ◯   2   ◯   3   ◯   4   ◯   5   ◯ Did not attend

✎   Please comment on this break-out gro

Page 2 - Question 9 - Open Ended - One or More Lines with Prompt

Please comple this question if you attended a breakout group not listed here.

Name of breakout group:
Rating of usefulness (1-5):
Comments:

Page 2 - Question 10 - Rating Scale - Matrix

11:00   Discussion and Wrap-up

	Not useful at all	A little useful	Somewhat useful	Very useful	Extremely useful	Did not attend
.	◯ 1	◯ 2	◯ 3	◯ 4	◯ 5	◯ Did not attend

✎   Please comment on this sessi

Page 2 - Question 11 - Yes or No

Are there any additional concepts that you wish had been covered during this workshop?

◯ Yes
◯ No
◯ If yes, please explain:

Page 3 - Question 12 - Rating Scale - Matrix

Page 3 of 5
Evaluation of Workshop Presentation
Please rate each aspect of the workshop presentation on a scale of 1-5; 1 = poor, 5 = excellent.

	Poor	Fair	Good	Very good	Excellent
Speakers' preparedness and organization	◯ 1	◯ 2	◯ 3	◯ 4	◯ 5
Speakers' ability to convey information in an understandable manner	◯ 1	◯ 2	◯ 3	◯ 4	◯ 5
Speakers' ability and responsiveness to answer questions to your satisfaction	◯ 1	◯ 2	◯ 3	◯ 4	◯ 5
Discussion leaders' ability to facilitate discussions	◯ 1	◯ 2	◯ 3	◯ 4	◯ 5

Page 3 - Question 13 - Open Ended - Comments Box

Please comment on the quality of the speakers' presentation and/or facilitator's discussion.

Page 3 - Question 14 - Rating Scale - One Answer (Horizontal)

What percentage of the information that was presented during this workshop was new information and/or skills to you?

0% was new (I already knew all of this)	75% was new (I knew most of this already)	50% was new (I knew about half of this already)	25% was new (I knew a little of this already)	100% was new% (This was all brand new information to me)
◯ 1	◯ 2	◯ 3	◯ 4	◯ 5

What was the level of difficulty for you of the information that was presented during this workshop ?

Extremely easy	A little too easy	Just right	A little too difficult	Extremely difficult
○ 1	○ 2	○ 3	○ 2	○ 1

Evaluation of Workshop Logistics
Please rate your satisfaction with the following aspects of this workshop on a scale of 1-5; 1 = very low, 5 = very high.

	Very low	Fairly low	Moderate	Fairly high	Very high
Time of year (appropriate, convenient)	○ 1	○ 2	○ 3	○ 4	○ 5
Pre-conference information	○ 1	○ 2	○ 3	○ 4	○ 5
Registration process	○ 1	○ 2	○ 3	○ 4	○ 5
Overall organization (focused, started/ended on time, equipment was ready)	○ 1	○ 2	○ 3	○ 4	○ 5
The format of the conference (i.e. morning sessions, breaks, lunch, afternoon breakouts)	○ 1	○ 2	○ 3	○ 4	○ 5
Atmosphere (friendly, supportive, promoted teamwork)	○ 1	○ 2	○ 3	○ 4	○ 5
Leadership (built working relationships, encouraged involvement)	○ 1	○ 2	○ 3	○ 4	○ 5
Technology (availability and quality of equipment and internet connection)	○ 1	○ 2	○ 3	○ 4	○ 5
Accommodations (physical comforts, bathroom facilities, safety, location, etc.)	○ 1	○ 2	○ 3	○ 4	○ 5
Refreshments (quality, quantity, dietary needs, preferences, freshness)	○ 1	○ 2	○ 3	○ 4	○ 5

What improvements would you recommend in these areas?

What is the likelihood that you will recommend this workshop to a friend and/or attend a similar workshop?

	No likelly at all	A little likely	Somewhat likely	Very likely	Extremely likely
To recommend this workshop to a friend.	○ 1	○ 2	○ 3	○ 4	○ 5
To attend another workshop similar to this one in the future.	○ 1	○ 2	○ 3	○ 4	○ 5

Please provide any comments you have to improve this workshop such as future conference locations, speakers, or general suggestions.

Page 4 of 5
Impact of Workshop Participation

Page 4 - Question 20 - Rating Scale - Matrix

Goal 1: Increase knowledge of principles, pedagogy, merits, and limitations of project-based instructional design
Please rate how much your knowledge and preparedness has increased in the following areas on a scale from 1-5; 1=not at all, 5=a great deal.

	Not at all	A little	A fair amount	A good amount	A great deal
My knowledge of the principles of project-based instructional design	○ 1	○ 2	○ 3	○ 4	○ 5
My knowledge of inquiry-based statistics.	○ 1	○ 2	○ 3	○ 4	○ 5
My preparedness with sufficient content knowledge to implement this curriculum	○ 1	○ 2	○ 3	○ 4	○ 5
My preparedness with sufficient pedagogical strategies to implement this curriculum	○ 1	○ 2	○ 3	○ 4	○ 5
My knowledge of the merits of project-based instructional design	○ 1	○ 2	○ 3	○ 4	○ 5
My knowledge of the limitations of project-based instructional design	○ 1	○ 2	○ 3	○ 4	○ 5

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Goal 2: Plan to try, use, or take up individual features and resources from the project-based curriculum and incorporate them in their instruction.
What is the likelihood that you will use or implement the following project-based course features in your own statistics classroom or in a statistics class you will teach in the future?

	Not likely at all	A little likely	Somewhat likely	Very likely	Extremely likely	I already implement this in my course
Students choose their own research questions based on existing data	○ 1	○ 2	○ 3	○ 4	○ 5	○ I already implement this in my course
Use of large real-world data sets	○ 1	○ 2	○ 3	○ 4	○ 5	○ I already implement this in my course
Didactic portions heavier out of class and support for active engagement heavier in class ("upside-down or flipped" classroom)	○ 1	○ 2	○ 3	○ 4	○ 5	○ I already implement this in my course
Flexible content and possible outcomes for all types of learners	○ 1	○ 2	○ 3	○ 4	○ 5	○ I already implement this in my course
Inclusion of scientific writing	○ 1	○ 2	○ 3	○ 4	○ 5	○ I already implement this in my course
Just in time (need to know) content knowledge that supports various steps in the students' empirical projects	○ 1	○ 2	○ 3	○ 4	○ 5	○ I already implement this in my course
Availability of data representing different disciplines	○ 1	○ 2	○ 3	○ 4	○ 5	○ I already implement this in my course
Use of syntax based software for statistical programming	○ 1	○ 2	○ 3	○ 4	○ 5	○ I already implement this in my course
Syntax translation across more than one software program	○ 1	○ 2	○ 3	○ 4	○ 5	○ I already implement this in my course
Presentation and practice with multi-variate tools (e.g. multiple and logistic regression)	○ 1	○ 2	○ 3	○ 4	○ 5	○ I already implement this in my course
Full research presentation as part of student evaluation (e.g. poster session or other)	○ 1	○ 2	○ 3	○ 4	○ 5	○ I already implement this in my course

Opportunity for students to communicate with people outside the course that represent a diverse audience	❍ 1	❍ 2	❍ 3	❍ 4	❍ 5	❍ I already implement this in my course
Infrastructure for unlimited-one-on-one support (mentored groups, peer tutors, etc.)	❍ 1	❍ 2	❍ 3	❍ 4	❍ 5	❍ I already implement this in my course

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What is the likelihood that you will use the following resources to share and disseminate information you have learned in this workshop?

	Not likely at all	A little likely	Somewhat likely	Very likely	Extremely likely
Statistics writing models	❍ 1	❍ 2	❍ 3	❍ 4	❍ 5
Translation syntax across 4 statistical software packages (R, SAS, Stata, SPSS)	❍ 1	❍ 2	❍ 3	❍ 4	❍ 5
Lecture clips	❍ 1	❍ 2	❍ 3	❍ 4	❍ 5
Open Learning Initiative	❍ 1	❍ 2	❍ 3	❍ 4	❍ 5
Catalyst resources	❍ 1	❍ 2	❍ 3	❍ 4	❍ 5
I Book	❍ 1	❍ 2	❍ 3	❍ 4	❍ 5

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Goal 3: Identify interdisciplinary opportunities for teaching introductory statistics by networking with other participants and sharing insights and resources
Please rate how much your knowledge of interdisciplinary opportunities for teaching introductory statistics and intent to continue networking have increased on a scale from 1-5; 1=not at all, 5=a great deal.

	Not at all	A little	A fair amount	A good amount	A great deal
My knowledge of interdisciplinary opportunities that are available to teach introductory statistics	❍ 1	❍ 2	❍ 3	❍ 4	❍ 5
My knowledge of how to work with departments other than my own to develop a course on introductory statistics	❍ 1	❍ 2	❍ 3	❍ 4	❍ 5
My insights and knowledge of resources available to develop an introductory statistics course	❍ 1	❍ 2	❍ 3	❍ 4	❍ 5
My intent to follow-up with workshop leaders at a later time for additional information and networking	❍ 1	❍ 2	❍ 3	❍ 4	❍ 5
My intent to keep in touch with other workshop attendees to continue networking on developing introductory statistics lessons	❍ 1	❍ 2	❍ 3	❍ 4	❍ 5

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Goal 4: Recommend the project-based approach to others at their institution who are responsible for decision making around statistics curriculum
Please rate how likely you are to recommend the project-based approach to others at your institution who are responsible for decision making around statistics curriculum on a scale from 1-5; 1=not likely at all, 5=extremely likely.

	Not likely at all	A little likely	Somewhat likely	Very likely	Extremely likely
I will talk to other instructors in my department about the merits of the project-based approach to teaching statistics	❍ 1	❍ 2	❍ 3	❍ 4	❍ 5
I will talk to my department chair about the merits of the project-based approach to teaching statistics	❍ 1	❍ 2	❍ 3	❍ 4	❍ 5
I will talk to instructors in departments other than my own about the merits of the project-based approach to teaching statistics	❍ 1	❍ 2	❍ 3	❍ 4	❍ 5
I will talk to administrative personnel at my university about the merits of the project-based approach to teaching statistics	❍ 1	❍ 2	❍ 3	❍ 4	❍ 5

Goal 6: Be motivated to submit a proposal to develop, implement, and/or assess project-based statistics curricula

Please rate your likelihood of submitting a proposal for the following reasons on a scale from 1-5; 1=not likely at all, 5=extremely likely.

	Not likely at all	A little likely	Somewhat likely	Very likely	Extremely likely
I will submit a proposal to develop project-based statistics curricula	❍ 1	❍ 2	❍ 3	❍ 4	❍ 5
I will submit a proposal to implement project-based statistics curricula	❍ 1	❍ 2	❍ 3	❍ 4	❍ 5
I will submit a proposal to assess project-based statistics curricula	❍ 1	❍ 2	❍ 3	❍ 4	❍ 5

Thank You Page

We appreciate the time you have taken to complete this survey.
All of your responses are anonymous and will be reported as an aggregate of students' responses.
If you have any questions, please feel free to contact me.
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