

Online Faculty Instruction to Improve Interactive Teaching of Economics

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This paper describes the online component of the Teaching Innovations Program (TIP) sponsored by the Committee on Economic Education of the American Economic Association and funded by the National Science Foundation. Seven online instructional modules were made available to TIP participants: Assessment, Cases, Context-Rich Problems, Cooperative Learning, Discussion, Experiments and Large Enrollment Courses. Participant evaluations indicate that the modules were efficiently organized and effective in improving teaching by over 100 college and university instructors who completed at least one module. Implications for economics education are presented including recommendations for expansion of this highly successful program.

The Teaching Innovations Program (TIP), sponsored by the Committee on Economic Education of the American Economic Association and funded by the National Science Foundation (DUE #03-38482), ran for five years, serving 334 faculty teaching in a wide variety of U.S. colleges and universities.¹ Two workshops were held each year (Phase 1) in which participants were introduced to seven modules on innovative economics instruction. Participants were then invited to sign up for online instruction in two of the modules (Phase 2), applying the innovation in one of their courses. Successful completion of two modules earned participants a certificate of achievement from the Committee on Economic Education. Finally, TIP offered support for participants to develop scholarly papers and presentations based on their work in one or more modules (Phase 3.) In this paper, I describe the structure of the TIP Phase 2 modules, summarize participant experience with the modules and suggest implications of the Phase 2 project for economic educators.²

The Phase 2 modules

Seven Phase 2 modules were offered at the University of Nebraska Blackboard web site: Assessment, Cases, Context-Rich Problems, Cooperative Learning, Discussion, Experiments and Large Enrollment Courses. A TIP Preview page provided a summary of each module, examples of participant work, all materials presented at the TIP workshops, required readings for completion of the module, and additional recommended readings.

When participants chose to enroll in a module, they were presented with a list of tasks using a common structure in each module. See Appendix 1 for a screen shot of a representative module showing the module assignments beginning with a short self-graded assessment followed

¹ My role in the project was as staff at two workshop sessions, the instructor for one module, and coordinator of the Phase 2 web site, coordinating the instructional modules, enrolling participants, and summarizing the evaluations.

² For more information on Phase 1 and Phase 3 see Walstad (2010), Salemi (2010) and McGoldrick (2010).

a set of required readings after which participants planned use of the innovation in a course they currently taught. Participants then identified the learning goals for that innovation and described how they would implement the innovation. See Appendix 2 for a sample of a participant plan, including comments by the module instructor showing the detail required in designing innovations and the extensive comments provided by the module instructor. After receiving feedback from the module instructor, usually in a week or two, and often involving a back-and-forth discussion about the plan, the participant used the innovation in the classroom and completed a reflective exercise, evaluating the innovation and providing evidence of its outcomes. Finally, participants completed an anonymous evaluation of the module as a whole.

Implementation of the innovation varied from the module to module.

Assessment: Participants read about formative and summative assessment and then evaluated methods currently used in their course and added a new classroom assessment technique.

Cases: A case is a group of source materials on a single subject, drawn from real experience that places the participants in a decision-making analytical role. In the module, participants learned how to write a case and teach a case, and then used a case in one of their courses.

Context-rich problems: A context-rich problem is a short scenario using a non-standard application. In the module, participants read about the principles of context-rich problems, wrote three context-rich problems and then used and evaluated one a course.

Cooperative learning: In cooperative learning, the instructor designs a structured, systematic instructional strategy in which small groups work together toward a common goal. In the module, participants read about cooperative learning and then designed and implemented a cooperative learning exercise.

Discussion: Using the inquiry approach, students read a text and prepare for discussion in advance while the instructor prepares discussion questions, distributes them in advance, and then during discussion, serves as a facilitator rather than as a participant. In the module, participants designed and led a classroom discussion using the inquiry approach for one of the module readings.

Experiments: In a classroom experiment, students make economic decisions in a controlled environment that become the data the class later analyzes. In the module, participants choose a classroom experiment, adapting it for their course, and then used the experiment in a course.

Large-enrollment courses: The purpose of the large lecture module is to help workshop instructors learn about and use techniques that add interactive learning to large enrollment courses in economics. In the module, participants implemented six activities or format changes necessary for a large enrollment course.

Evaluation

About two-thirds of TIP workshop participants chose to enroll in a module, of whom over one-half had completed a module, and about one-sixth earned the certificate for completing

two modules.³ The modules most often chosen were Discussion, Experiments, and Cooperative Learning, each completed by more than forty participants.

Representative comments from participants

There is plenty of information in the module to get you started, but the instructor's review of materials really makes all the difference. The feedback, at all stages, is great! What I found most useful was the opportunity to practice the suggestions in the readings by planning for a class, engaging my students in a class discussion, and evaluating the outcome--all with your very prompt, supportive feedback.

The instructor was committed to the goals of the project, and was willing to engage in extensive discussion with me. This interchange helped me improve my understanding, and to apply this discussion innovation to my own objectives in my own classes.

The quality of the feedback I received from the moderator was excellent. I think this is what helped me to learn the most.

I think the feedback from the module leader is a very extraordinary and beneficial part of this program. This is true with this module as well as the others. Fabulous!

Anonymous evaluation of the modules was overwhelming positive indicating that the modules were efficiently organized and effective in improving instruction by TIP participants. In response to the close-ended section of the survey, 97% thought the follow-on instruction was “a better use” or “good use of my time as the next best alternative,” and 98% strongly agreed or agreed that they received helpful feedback from the module instructor, and 100% strongly agreed or agreed that the module helped them learn how to use the innovation (n = 153 See appendix three for a summary of responses to all evaluation questions.) Open ended survey questions indicate that the modules were successful for three primary reasons: they followed directly on workshop content; they allowed participants to experiment with an innovation in a course they were currently teaching; they allowed for repeated and supportive interaction with experts.

³ Data as of December 2009 with six months still available for participants to complete the program.

Only a few aspects of the modules were less highly evaluated or criticized in the open-ended prompts. Participants felt somewhat constrained by the Blackboard website that required log-in so that most instructors communicated directly with participants via email. The lowest rated section of the module was “check your understanding,” usually a multiple choice self-graded test—although the level of dissatisfaction was only 12% neutral or disagreeing with the statement that it helped them.

Implications for economics education

TIP Phase 2 offers a model for future projects in economic education and indeed for other disciplines seeking to foster innovative instruction. Credit goes to the project’s well-designed format goes to co-principal investigators Michael Salemi and William Walstad who envisioned the three part structure of TIP, and outlined the module format for each instructor. The result was an effective set of modules that benefited over one hundred and fifty instructors who completed at least one module as of November 2009 at relatively little dollar cost. Note the entire TIP budget served each participant at less than \$1400, including the cost of workshops, follow-on instruction, administration, and overhead. Of course, there was also significant time required from the module instructors, only partially compensated. However, all module instructors reported quite enjoyable and intellectually-satisfying interaction with the TIP participants.

Several features of TIP Phase 2 stand out as particularly noteworthy:

- 1) Often faculty development workshops stimulate interest in new teaching techniques that are then never used (Roy, 1998). By contrast, TIP participants were invited to continue their interaction with the project staff, using the modules studied during the intense

workshop atmosphere in a sustained learning experience extending into the upcoming academic year.

- 2) Work in Phase 2 was designed to encourage participants to move beyond their usual pedagogical practice. The module instructors were supportive, recognizing that participants often chose an innovation with which they were unfamiliar. Two modules, Cases and Context-Rich Problems, introduced participants to teaching techniques that are new or little used in economics,. The modules for Cooperative Learning, Discussion and Experiments presented pedagogies that were familiar to most economists, but required participants to implement these techniques in a more intentional manner than most had considered. Finally, the Assessment and Large Enrollment modules asked participants to adopt classroom assessment techniques and evaluate instruction in a more careful manner than is commonly done. Participants reported combined use of TIP pedagogies, pooling experience gained at the workshop one innovation with another used in the module. For example, cooperative learning was used frequently with context-rich problems, a combination that participants reported as leading to more effective instruction.
- 3) The study of an innovation occurred at the same time it was being used in a course, with feedback provided before and after implementation. The feature identified as most important for participant learning was the repeated interaction with the module instructor. The participants plan for using the innovation was revised, usually based on several email discussions with the module instructor. Appendix 2 shows one interaction between participant and module instructor. The final step, assessment of the innovation, also received formative feedback, leading in many cases to further investigation culminating in presentation or publication based on the TIP work (McGoldrick, 2010).

4) The TIP modules were built on a series of steps from identification of learning goals, to implementation of the innovation, to final assessment. By requiring that participants complete all steps, the module took participants through a cycle of course preparation that is often recommended but not always followed. (Wiggins and McTighe:16; Fink:73-81) The difficulty noted below that some participants found in two of the steps, identifying goals and designing assessment procedures, underscores the importance of the entire cycle for effective course design.

What comes next?

The TIP Phase 2 modules comprise a resource that should be preserved and extended. Both the content of the modules as well as the overall structure have demonstrable success that should be made available to even more economics instructors, including graduate student students who currently are teaching or will be shortly. Continuation of TIP could be even more successful with minor alterations in its format.

*The course management system--*One limitation of Phase 2 was its reliance on a university course management system designed for traditional college courses. Thus the self-assessment function looked like a test and likely reminded participants of graded summative assessment that was not intended. Also, the necessity for logging in with passwords meant that some instructors bypassed Blackboard, preferring to use traditional email instead of using the Blackboard communication tools. As a result, individual instructors maintained records of participant work, but there was no central repository as could have been possible had all work been sent through Blackboard. Although clearly there were advantages of using an existing system that offered

ready technical support, ideally, a revised Phase 2 would use a more flexible course management system that could be formatted for TIP and would encourage archiving of all communications and participant work.

Greater attention to learning goals. Economic educators, and education researchers more generally, agree that learning goals need to be identified before pedagogical techniques are selected (Hansen et al 2002; Fink 2003; Weimer 2002) Indeed, all TIP modules first ask participants to specify what students would learn. Participants recognized the importance of this step, one that despite its primacy was not always part of their curriculum planning.

Participant comments on learning goals

Participating in this module forced me to sit down and think about the topics that students find particularly difficult in the second principles course and to come up with a strategy to help them.

What I liked best about this module is that this kind of assignment needs a significant amount of thinking-time for the instructor to figure out the goals of the course, and how this assignment can achieve them.

As I said in the earlier assessment, it made me think about what and how I choose to teach. I think that it's very easy to teach on autopilot, and this made me examine my choices.

The suggestions obtained from the module instructor forced me to think through the objectives of this exercise.

Because writing learning goals often was a new experience for TIP participants, future TIP efforts might provide additional support to help participants write learning objectives. A “Learning Goals” tutorial could be based on *Understanding by Design* (Wiggins and McTighe. 2005: Chapter 3) or *Creating Significant Learning Experiences* (Fink 2003)

More support for assessing the innovation. The final step in each module asked participants to assess the innovation's impact on student learning. Because TIP modules were exploratory, often the first time that the participant had used the innovation, the assessment was relatively informal, sharing with the module instructor what went well and what did not. In many cases, the assessment was posted for other TIP participants on the Blackboard web site, and later was the basis for more scholarly work, appropriate for conferences or publication in Phase 3 (McGoldrick, 2010.)

At all stages, however, participants encountered the question of what constituted evidence for which TIP modules offered little explicit guidance other than feedback from module instructors. Future TIP modules could provide support so that participants can anticipate what might be used as evidence as a separate module or as a feature available within each module. This "What is evidence?" tutorial would recommend first of all that more data be collected, even if it was not all used in the final report. For example, it is a relatively simple matter to save copies of student work, survey students before an innovation is begun, videotape students in the classroom, or keep a record of the instructor's work and thoughts as the innovation was planned. Such information can be reviewed to form hypotheses about what occurred as result of the innovation. Furthermore, these results can serve as sources of evidence including empirical measures if, for example, a rubric is used to evaluate student work. ⁴

Connections between pedagogical practices At the TIP Phase 1 workshops, innovative pedagogy was interwoven into the sessions so that when, for example, participants investigated classroom experiments, they did so using principles of cooperative learning that had been presented in a

⁴ For more on use of evidence and rubrics see: Becker, 2004; Cross and Steadman, 1996; Bernstein et al 2006; McKinney, 2007; Gurung and Schwatz 2009.

prior session. For participants' first classroom use of an instructional technique, it is helpful to focus on one innovation at a time. However, research in physics education suggests that the combined use of innovations has a synergetic effect, improving learning more than the sum of individual innovations. (Pollack, 2005). Future design of Phase 2 modules could include more cross-referencing between modules to encourage follow-on projects that combine more than one active learning technique.

Connections with other resources on teaching and learning Phase 2 could be extended to include more links to research both in economics education and in other disciplines in which the module's innovation has been adopted. These resources would build participants' knowledge as they consider Phase 3 scholarly projects. In addition, TIP participants could collaborate with other economic educators, beginning to create a "teaching commons," bridging the gap between classroom instruction and education research. (Huber and Hutchings, 2005). Such a community would be even more informed if it crossed disciplines, sharing the comparative advances of each discipline's work on teaching and learning. See Starting Point: Teaching and Learning Economics for one effort in this direction (<http://serc.carleton.edu/econ/index.html>).

Overall, TIP was a success, reaching more economic instructors than any previous effort in economic education at the college and university level. Phase 2 was an important component, building on the more commonly-used workshop model so that instructors applied what they had learned in the workshops in an intentional manner guided by experts in each pedagogy. Every effort should be made to preserve the resources already created and to extend their availability to a wider community.

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Appendix 1

Overview page for the Classroom Experiment Module

Blackboard Academic Suite - Mozilla Firefox

File Edit View History Bookmarks Yahoo! Tools Help

http://my.unl.edu/webapps/portal/frameset.jsp?tab_id=_2_1&url=%2fwebapps%2fblackboard%2fexe

System Announcement My.UNL MyStuff Courses Community Library Academic Resources Student Resources Scholar Blackboard 9 Training

TIP: PREVIEW (TEMP_TIP007_20053) > EXPERIMENTS MODULE

Experiments Module

How to Use the Classroom Experiment Module

What is the purpose of this module?

This module helps TIP participants find a classroom experiment and use it in their courses.

The module includes:

1. A set of three required readings that provide an introduction to classroom experiments. One of the readings (Using Classroom Experiments to Teach Economics by Denise Hazlett) was a follow-up handout at the TIP workshop session on classroom experiments.
2. Additional readings that help instructors choose an experiment and decide how to use it.
3. Further articles on classroom experiments that instructors can read and use as their interest guides them.
4. A preparatory exercise, an assessment, and a survey.

When should I use this module?

Completing the module entails the following steps:

1. Read the three required introductory articles.
2. Use the other readings to help choose the classroom experiment you want to run. These readings describe some experiments in detail, and provide information about resources to help you find out about others. The experiment you choose does not have to be one of the ones explicitly described in these readings. Nor do you have to read all of these articles. You can simply read until you've found an experiment you wish to run.
3. Complete and submit the preparatory exercise at least three weeks before you plan to run the experiment.
4. Revise your preparatory exercise in light of the feedback you get from TIP staff, and resubmit it at least one week before you plan to run the experiment.
5. After running the experiment, complete and submit your assessment of the experiment. You will receive feedback on this assessment which will help you prepare a two-page final report that can be shared with other interested parties.
6. Complete and submit the short survey evaluation of this module.

Introductory Readings

This folder contains the three readings on classroom experiments that everyone working through this module should read as an introduction to classroom experiments. The first of these readings (Using Classroom Experiments to Teach Economics by Denise Hazlett) was the follow-up handout at the TIP workshop.

Done

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Appendix 2

Sample participant plan with module instructor comments

1. Based on the One-Sentence-Summary Objective Setting Exercise, list one or two learning objectives you want your students to achieve as a result of implementing this cooperative learning exercise.

I want to develop my students' ability to interpret and communicate both sides of controversial health care policy issues during the 2008 presidential election. This will be done both in and out of class by facilitating group analysis and presentation of various health care issues currently being debated in the presidential campaign to help my students learn how to synthesize and communicate health care reform proposals.

2. List one or two content objectives you want your students to achieve as a result of implementing this cooperative learning exercise.

Students will understand and be able to evaluate the various issues in Senator McCain's and Senator Obama's health care reform proposals (i.e. health insurance mandates, pre-existing conditions, etc.).

3. What category of cooperative learning exercises best fits your objectives? Briefly explain why this is the case.

The writing category with my addition of an oral presentation fits my objective of students being able to synthesize and communicate health care issues. The synthesis will happen with the group writing portion (written group worksheets) and the communication will happen with the oral group presentations.

4. What specific type of cooperative learning exercise for the category noted in question 6 best fits your objectives? Briefly explain why this is the case.

Features of the round table exercise will be used for the writing portion. Students will be divided into groups of four and given an issue to research and present to the rest of the class. Group members will conduct individual initial research on their assigned issue and will then bring a completed individual worksheet to share with the rest of the group. Note that I believe this initial individual research will be necessary because the students will have limited knowledge about the health care issues. Group members will share their responses in a round table format. They will then work to synthesize their individual answers to produce a group version of the written worksheet.

5. Describing your cooperative learning exercise through the process of implementing and evaluating.

- a. Preparations (Structuring the Task, Orienting Students,): Please provide a description of the exercise you have developed. It should address how the task will be structured and how students will be oriented to cooperative learning.

Students will first be introduced to this project through a paragraph in the syllabus that includes a brief description of the forthcoming activity and the expected outcomes. The paragraph below is what will be included in the syllabus:

By utilizing the forthcoming presidential election, we will be examining and discussing specific issues pertinent to the U.S. health care system. We will do this through examination of the health care reform proposals of Senator McCain and Senator Obama. You will work in a small group to prepare a written outline of an oral presentation. Group members will be chosen at random to present the various sections of the presentation. As a capstone for this project each student will be responsible for writing a 6-8 page paper.

The structure of the project that I have developed is threefold. There is an initial individual portion, a middle group cooperative portion and then a final individual portion. On September 29, the class will be broken up into groups of four and each group will be assigned a health care issue currently being debated during the presidential election. The initial individual portion of the project is that each student has one week to complete a worksheet for the assigned topic (see attachment 1). This worksheet includes a section for the student to provide some background information on the assigned issue, find or create examples that illustrate the issue, summarize how Senator McCain's policy addresses the issue, and summarize how Senator Obama's policy addresses the issue. This initial individual writing assignment is to ensure that each student obtains background knowledge of their topic before discussing it in a group.

On October 6, the cooperative learning portion of the project will take place during class. The students will bring their individual worksheets to class and then meet in their small groups to discuss, synthesize and compromise until a group version of the same worksheet has been produced (see attachment 2). This written worksheet will serve as the basis of an oral presentation to the rest of the class, which the students will have one week to prepare. The presentations will cover the same four aspects of the health care issues included in the worksheet. On the day of the presentation, the group members will be chosen at random to present a portion of the presentation. Therefore, each student will be presenting one section from the group's presentation but they will not know which one (i.e. background, McCain's proposal, etc.). These presentations will be on October 15 and 17.

The final individual portion of the project is a written paper allowing the student to summarize and evaluate the information presented by all the groups. This paper should be 6-8 pages long and will be due roughly 3 weeks after the presentations are over (about November 3).

- b. Set up (Introducing the Exercise, Forming Groups, Group Decision Making Strategies): Briefly describe how you will introduce this exercise to students, what method of group formation and of what size you have chosen, and the extent to which you will describe group decision making processes to your students.

When I introduce the project to the class on September 26, I will pass out a descriptive handout that outlines the process of the activity and deadlines (see attachment 3). I will form groups randomly using my alphabetical listing of the roster. I anticipate having 8 groups of 4 students. Groups will be instructed to continue discussing individual responses and review resources until they can all compromise on a group response to each question.

- c. Monitoring (Behaviors, Task Completion): Briefly describe how you will interact with groups during the exercise and what follow on activities you have developed for those groups finishing their task early.

I have scheduled a 50 minute class period to devote to in class group work. I will be circling throughout the room to keep an eye on each of the groups to make sure they are on task, reinforce positive progress and be available to answer any clarifying questions about the project (not content). If a group finishes before the class period is over I will quickly review the group worksheet and either suggest areas needing improvement or direct the group to begin preparing the oral presentation.

- d. Closure: (Quiet Signal, Providing Closure to the Exercise, Processing Group Functioning, Grading and Evaluation): Briefly describe your quiet signal, how you will bring closure to the exercise, the extent to which you will discuss group functioning with the class, and whether this exercise will be directly evaluated.

I typically bring a class back together after group work by standing in the front of the room and asking for their attention. This typically works, but if it doesn't then I will flick the lights on and off as a signal.

This activity will be evaluated for a grade. There will be an immediate formal reporting out activity in the form of a group worksheet that includes the synthesized responses of each group for its health care issue. The group is required to turn its completed worksheet in to me before leaving class on the in-class work day. I will grade the worksheets on the basis of correct content and completeness, and return them the next class period so the groups can use them to create their oral presentations.

There will also be a delayed formal reporting out activity in the form of an oral presentation that will be graded for accurate content, clarity, knowledge of the material and effectiveness in conveying the information to the class. As mentioned above, the students will be chosen at random to present one section of their group presentation. This will promote students working hard together to ensure that each group member fully understands and can explain any section of the presentation.

6. Briefly explain how each of the four key elements will be incorporated into this exercise.

e. Positive interdependence

Output goal interdependence – each group must develop a single group worksheet and oral presentation.

Learning goal interdependence – group members will be chosen at random to present the various sections of the oral group presentation. Therefore, all members of the group need to be able to explain every section of the group's presentation.

f. Individual (and group) accountability

Individual accountability - Each student is responsible for preliminary research that he or she then shares with the group. In addition, after all of the groups have completed their presentations, each of the students is responsible for writing a 6-8 page analysis of all of the issues presented by the groups.

Group accountability – Each group will receive a group grade for its group worksheet and oral presentation.

g. Equal participation

Students will be required to do initial research on their group's assigned health care issue before actually working together as a group. Each student must find at least two resources to bring to class and complete a worksheet where he or she completes initial thoughts/preliminary answers to each of the four sections for the assigned issue. This ensures that the individual group members are prepared to participate in the round table exercise in class with their groups.

Also, groups of four students will be formed and each group will be preparing an oral presentation of the four sections of their assigned issue (background and current state, examples illustrating the issue, McCain's position and Obama's position). Students will be chosen at random to present one of the sections from their group's presentation.

h. Simultaneous interaction

The students will work as a group to synthesize and revise their individual worksheet responses into a group worksheet which will be the basis for their oral group presentation. Since students are working in small groups, more than one student will be participating at any one time.

7. Now that you have fully described your cooperative learning exercise, please explain briefly how you will decide whether or not your students have met the objectives you outlined above. How will you evaluate whether you have met your instructional objectives? What evidence will you collect?

I will be assigning grades for the individual worksheets, group worksheets, oral presentations, and individual follow up papers (see attachments 4-7). The grades from the cooperative learning portion of the project (group worksheets and group oral presentations) will show whether the students met my learning objective of being able to synthesize and communicate health care reform policies. The final written paper is an individual extension of the group work which will allow me to judge how well the students can not only communicate but also apply their new knowledge to formulate their own positions.

Appendix 3

Module Evaluation

Data as of November 26, 2009. n= 153

1. The time I spent completing follow-on instruction using this module has been:

A better use of my time than the next best alternative	59%
As good a use of my time as my next best alternative	37%
Of some value, but I could have put my time to better use	3%
Almost a complete waste of time	0%

2. The module was easy to use.

Strongly Agree	59%
Agree	35%
Neutral	3%
Disagree	2%
Strongly Disagree	0%

3. The selection of readings included in this module was useful for learning about the innovation.

Strongly Agree	63%
Agree	33%
Neutral	4%
Disagree	0%
Strongly Disagree	0%

4. Completing the "check your understanding" assignment helped me learn about the innovation.

Strongly Agree	48%
Agree	41%
Neutral	10%
Disagree	2%
Strongly Disagree	0%

5. The preparatory plan assignment provided a valuable guide as I planned my use of the innovation.

Strongly Agree	71%
Agree	25%
Neutral	4%
Disagree	0%
Strongly Disagree	0%

6. I received helpful feedback from the TIP module instructor.

Strongly Agree	89%
Agree	8%
Neutral	2%
Disagree	0%

Strongly Disagree 0%

7. Completing the assessment of my innovation was a worthwhile activity.

Strongly Agree 61%

Agree 31%

Neutral 7%

Disagree 0%

Strongly Disagree 0%

8. Overall, this module helped me to learn how to use the innovation.

Strongly Agree 78%

Agree 22%

Neutral 0%

Disagree 0%

Strongly Disagree 0%