Preparing Teachers to Teach High School Statistics: a report on the INSPIRE project

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Background

INsight into Statistical Practice, Instruction and REasoning, INSPIRE, is a 3-year NSF-funded program now beginning its second year. INSPIRE is a collaboration between the American Statistical Association (and initiated by the ASA's Advisory Committee on Teacher Education), California Polytechnic University San Luis Obispo, and the University of California Los Angeles. INSPIRE was designed as a response to the critical need for teachers of Advanced Placement (AP) Statistics. Details about this program, as well as a rationale for why we feel INSPIRE fills a crucial need, were presented at the 2002 JSM.

In this paper we report on the design of the distance learning part of the course, which has taken place over this past year. Also, this year our first class of 32 participants was selected and attended a week long workshop at Cal Poly SLO in July, 2003.

The Participants

Our first class, representing 19 states, has been teaching at a high school for a median of 8 years and has been teaching statistics for a median of 1 year. Twenty-five percent have not taught statistics before. Almost all of these are math teachers, although two are primarily computer science teachers and one primarily a biology teacher.

At the workshop we had the chance to survey the participants on their hopes and concerns about the upcoming year-long distance learning course. A HOMALS (homogeneity analysis by alternating least squares) analysis provide us with a summary of their written responses. The most frequently expressed concern was that they lacked the time to participate fully in the course. Technology issues were also a major concern. These included concerns about having sufficient access to a computer, sufficiently fast internet access, general unfamiliarity with operating a computer, and concerns about software incompatilibies.

On the positive side, the participants expressed the hopes that INSPIRE would help them develop a community among their colleagues and improve their teaching. The most frequently expressed hope was that they learn more statistics, although some expressed this in terms of learning "basic" statistics and others wanted to "deepen" their understanding.

The Web Page

The distance course is held together by the Blackboard software program, which provides an organizational structure and which we use for communication, distributing materials and maintaining grades. The content for the course is stored separately on the UCLA Statistics server, which allows us greater control over how we present the material. Audio lectures with accompanying slides accompany each unit and are streamed via cast:stream software.

In designing the course, we felt that particular care had to be taken so that the participants were not overwhelmed, or even threatened, by the content. Instead, the content had to be rewarding and useful so that participants would want to log on to the site frequently. We were also aware that we were teaching teachers, and not their students, and therefore some material might be presented in a manner and at a level not appropriate for our participants to use in their own classrooms.

To achieve these goals, we divided the content into discrete units that could be completed in roughly 2 weeks. Each unit presents the material from a variety of perspectives, which allows the participants to choose the approaches that works best for them. Their grade is based on completing an open-ended "milestone" activity and participating in the group discussions. The participants can choose whether to listen to an audio "lecture" with slides that presents one or two examples; they can do practice problems to check whether they understand the basics; they can download and analyze a data set (using Fathom) to practice applying concepts; they can do activities that help them develop understanding; they can read our advice about how to teach these concepts.

The participants were divided into groups of eight, and each group is lead by an instructor who reads the milestones, hosts group discussions, and answers questions. Every 3 months the groups will be randomly re-generated, so that the participants get to work with a greater number of their colleagues and get experience with different instructors.

Lessons Learned

We used a product called cast:stream to stream audio on demand. This software turns out to have a rather steep learning curve and to require substantial time investments on the part of the producers of the content. There is a bit of a learning curve and some time-investment on the part of the participants as well. Many of the participants had great difficulties accessing the presentations and in fact, at the moment, just less than half of the participants still cant' access these presentations, despire great efforts on the part of our computing staff and, frequently, the computing staff of the participant's school.

Access to the computer turns out to be a very important factor to consider. Some schools have rather strict control over how their teachers use their computers. Even though we required the participants' administrators to write a letter pledging technical support, still some participants are unable to download files or access our site without permission. Also, network problems can take quite awhile before they're fixed and the participant again has access.

Acknowledgements

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Internet Resources

The content portion of INSPIRE can be viewed at http://inspire.stat.ucla.edu/unit_01

High School teachers interested in participating in 2004-05 should visit http://inspire.stat.ucla.edu after Nov. 15

Corporate web pages for Blackboard can be found at http://www.google.com/url?sa=U&start=1&q=http://www.blackboard.com/&e=7413

Corporate web pages for cast:stream can be found at http://www.caststream.com.

References

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