Award Abstract #0942246

An inquiry-based, supportive approach to statistical reasoning and application

NSF Org:	DUE Division of Undergraduate Education
Initial Amendment Date:	December 1, 2009
Latest Amendment Date:	December 1, 2009
Award Number:	0942246
Award Instrument:	Standard Grant
Program Manager:	Herbert H. Richtol DUE Division of Undergraduate Education EHR Directorate for Education & Human Resources
Start Date:	January 1, 2010
Expires:	December 31, 2011 (Estimated)
Awarded Amount to Date:	$174999
Investigator(s):	Lisa Dierker ldierker@wesleyan.edu (Principal Investigator) David Beveridge (Co-Principal Investigator)
Sponsor:	Wesleyan University 237 HIGH ST MIDDLETOWN, CT 06459 860/685-3683
NSF Program(s):	CCLI-Type 1 (Exploratory), S-STEM:SCHLR SCI TECH ENG&MATH
Field Application(s):	0116000 Human Subjects
Program Reference Code(s):	SMET, 9178
Program Element Code(s):	7494, 1536

ABSTRACT

A uniquely collaborative, inquiry-based course in introductory statistics is developed to serve 100 students per semester across both divisional and departmental boundaries. The curriculum combines new learning materials and innovative teaching strategies to pursue a multidisciplinary model of statistical inquiry, providing training in flexible application of knowledge, opportunities to analyze data in real world contexts, and education about statistical concepts through computing. A comprehensive resource

infrastructure is established to provide intense multilevel support to students, allowing them to work independently and creatively to explore their own scientific questions and make decisions about data analysis. The resources that students utilize will be dictated by their research question and results at each stage of their work. That is, beyond basic data management and hypothesis testing themes, students are learning most about what they need to know to answer their specific research questions by doing the work themselves. The course represents 50% of the student's semester curriculum, permitting full immersion in the process. Substantial recruitment efforts 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 broader impact is to provide 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. Finally, a strategy is developed to disseminate the course model and to make the newly developed teaching tools and supportive resources widely available to other universities.

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