

Recent Awards					
Presidential and Honorary Awards	Initial Amendment Date:	August 17, 2014			
About Awards	Latest Amendment Date:	August 17, 2014			
How to Manage Your Award	Award Number:	1431667			
Grant Policy Manual Grant General Conditions	Award Instrument:	Standard Grant			
Cooperative Agreement Conditions Special Conditions	Program Manager:	Michael Erlinger DUE Division Of Undergraduate Education EHR Direct For Education and Human Resources			
Federal Demonstration Partnership	Start Date:	January 1, 2015			
Policy Office Website	End Date:	December 31, 2017 (Estimated)			
	Awarded Amount to Date:	\$183,398.00			
	Investigator(s):	Susan Rodger rodger@cs.duke.edu (Principal Investigator)			
	Sponsor:	Duke University 2200 W. Main St, Suite 710 Durham, NC 27705-4010 (919)684-3030			
	NSF Program(s):	IUSE			
	Program Reference Code(s):	8209, 9178			
	Program Element Code(s):	1998			

ABSTRACT

OpenDSA is an open source project with international collaboration that has the potential to fundamentally change instruction in courses on Data Structures and Algorithms (DSA) and Formal Languages and Automata (FLA). By combining textbook-quality content with visualization and a rich collection of automatically assessed interactive exercises, OpenDSA helps students better understand the behavior of algorithms and their effects over time on data structures.

This project will scale up OpenDSA in a number of ways. The highly successful JFLAP software for interactive instruction on FLA will be redeployed within the OpenDSA framework using HTML5 standards, thereby increasing access. A wide range of colleges and universities will be involved in disseminating OpenDSA and assessing its impact on student learning, and OpenDSA's use in a number of innovative instructional settings will be explored. The OpenDSA infrastructure will be enriched, allowing instructors to tailor the materials to their specific classroom needs, and encouraging new content contributions from these instructors. A number of technical pedagogical experiments will be conducted, such as measuring the effects of augmenting content with audio narration in slideshows, and navigation through topics with concept maps. A study of how these materials can improve teaching in a range of courses for which relevant content was created. These efforts will have an impact on future active eTextbook projects by demonstrating successful ways to integrate content, interactivity, and assessment in an open-source, creative-commons environment

by focusing on the effects on student learning of integrating content with visualizations and a rich collection of practice exercises with automated feedback. In addition, this project will study how using eTextbook materials affects the evolving pedagogical approaches of instructors of DSA and FLA courses and will experiment with new models of dissemination for open-source content in conjunction with commercial online content publishers.

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