

Using Management Methods from the Software Development Industry to Manage Classroom-Based Research

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EXECUTIVE SUMMARY

This case details a classroom-based research and development project facilitated with management approaches adapted from the software industry to the classroom, specifically a combination of the methods generally known as 'Scrum' and 'Agile'. Scrum Management and Agile Software Development were developed in response to the difficulties of project management in the constantly changing world of technology. The on-going project takes a classroom of students and has them design and conduct research based on software tools they develop. An emphasis of the project is conducting research that involves all class members and makes students think critically about group management.

Keywords: Agile Software Development, Classroom-Based Research, Education, Group Management, Scrum Management, Social Science

ORGANIZATION BACKGROUND

New York State University at Malone began as a normal school for teacher training in 1815. Located approximately twenty-five miles south of the Canadian border, the University serves a large geographic region along the north side of the Adirondack Mountains. The project detailed here was done in the Instructional Communication Technology department located in NYSU Malone's School of Education. The department has origins as an Educational Technology department, but has expanded to meet the needs of students interested in business training as well as media production. The size of the department ranges between 50-75 students with four full-time faculty. The department only offers Master's degrees, specifically an M.S. in Education. Individual classes range from six to twenty students.

Students in NYSU Malone's ICT department come from a variety of backgrounds, approximately two thirds of students are pursuing a degree for a career in schools. The other third are

DOI: 10.4018/jcit.2011100105

students seeking a Master's degree to get employment in the private sector, in positions such as instructional designer or in media production. New York State requires teachers get a Master's degree to receive permanent certification, thus about a quarter of the total students in the graduate program are new full time teachers. The other education students are pre-service teachers looking to complete their Master's degree before they enter the job market. The program also hosts several students from China each year. Overall, the class is a diverse mix of students in terms of professional goals, national origin, and full-time or part-time student status.

The course that houses this project is titled ICT545: Design and Delivery of Professional Presentations, and is one of two potential options to fill a required part of the department's degree program. The number of students in the course ranged in this case study from approximately eight to twenty. The goal of the course is to teach students how to effectively use projected media to enhance public speaking. Since the course is at the graduate level it includes a research component, which is centered on data visualization.

Setting the Stage

New Methods in Software Development Team Management

The short, fixed length of the semester is only one of the factors that frequently influences classroom-based research and turns it into what is generally known in development as a 'waterfall' methodology (Shellnut, Knowlton, & Savage, 1999). Classes planned this way take students linearly through stages of design and development as the semester progresses. It is understandable, since for decades the government design and development model was a very linear one, even at centers for innovation such as the National Aeronautics and Space Administration (NASA). At NASA, it was called 'Phased Program Planning' (Delbeq & Vande Ven, 1971). In more recent times, businesses have realized the linear design and development model is too slow, and inhibits communication by separating people involved in a project (Takeuchi & Nonaka, 1986). Takeuchi and Nonaka (1986) were the first to apply the metaphor of rugby to the way leading technology businesses were managing the product pipeline. Instead of a linear step-by-step process, they found the product was constantly being passed between parts of the team, with all team members assisting in the forward movement of the product. This is where the metaphor for what is known as 'Scrum' comes from. Instructional Technology as a field puts particular emphasis on the idea of technology as process (Seels & Richey, 1994), so the application of Scrum techniques serves both as a practical classroom management tool, as well as a way for students to study a technological process from a closely related field.

Just as software has evolved dramatically through time, management of software development teams has also changed (Beck, 2000). The systems that have stemmed from this evolution are known as Scrum management, Agile software development and Extreme Programming, and are now used widely in digital media production and software development (Yuefeng & Patel, 2010). There is a growing body of literature about applying these techniques in a classroom development setting (Melnik & Maurer, 2002). These systems all have common themes that include regular time iterations linked to an emphasis on clear objective setting, a pragmatic and focused approach to documentation and meetings, and adaptability to changes in technology or environment (Highsmith, 2004).

The problems business managers encounter in group management are often quite similar to those facing technology educators (Schild, Walter, & Masuch, 2010). In a typical instructional technology curriculum, students will learn a range of instructional design models (Gustafson & Branch, 2002), and at the graduate level, students can expect courses on research methods. But if instructional technology faculty want to give students hands-on, authentic experience in

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