



## Bringing Water Quality Education to the World via eXtension

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The state of Florida and many other states have enacted urban landscape and fertilizer management ordinances as a result of the concern for the protection of bodies of water. In an effort to reduce nonpoint source pollution and its effect on water quality, ordinances require that commercial applicators obtain certification to legally apply fertilizer to urban landscapes. This certification must be renewed every four years with continuing education credits. Ordinances also apply to all urban residents and property owners. Many landscape professionals and urban residents need a better understanding of how landscape and fertilizer management practices are related to the causes and consequences of nonpoint source pollution. Understanding how to manage landscape practices to reduce urban runoff and leaching may encourage behavior change that results in protecting water quality. This Agent developed a program consisting of a series of articles, a series of PowerPoint presentations and five 10–14 minute videos. These educational tools educate fertilizer and pesticide applicators and the public on non-point source pollution, urban storm water run-off and leaching, water quality and conservation issues, and fertilizer practices. Each component is designed to measure knowledge gain and intent to improve or adopt recommended practices. In Florida, the Green Industries Best Management Practices training program estimates that over 100,000 commercial applicators will require certification and need to renew that certification in future years. The Agent's current program needed to be revised to meet the renewal criteria in a more readily accessible format, to anyone, anywhere and anytime internet access is available. The environment of eXtension Campus provides that format. This article introduces readers to the eXtension Campus environment as an accessible format for an urban water quality education program.

The objectives of this program are: to provide urban residents, property owners, and professionals with a water quality educational program that is engaging and measures attitudes and intent to improve or change landscape and fertilizer management practices; and to provide an alternative avenue for urban commercial fertilizer applicators to obtain continuing education units toward renewal of the Limited Certification for Urban Landscape Commercial Fertilizer Applicators certification.

### Methods

eXtension was developed to deliver messages using technology in response to recognized needs to compete for audiences differently. eXtension is an interactive learning environment launched in 2007 through Texas A&M University and available to and supported by many Land Grant Universities. eXtension is a website where Land Grant University content providers can post and exchange research-based, unbiased information to solve today's challenges. This website <<http://www.extension.org>> is available to students, researchers, clinicians, professors, and the general public.

eXtension offers platforms for interacting, learning, engaging, creating collaborative communities, sharing slide presentations, and participating in *Ask an Expert* and blogs. The eXtension Campus (Campus) provides the platform for online, e-learning,

interactive courses. The Campus utilizes Moodle, open source software to create personalized learning modules. Classes can be self-paced, instructor-led or a combination with directed learning paths. Courses can be designed to encourage collaboration, embed external sources, incorporate interactive games, track work flow, measure outcomes, and more.

Campus allows users to progress through training in a logical step-wise process. Course enrollees can be restricted to complete the course in a progressive manner or allowed to skip ahead to other course sections. Curriculum development tools enhance the designer's ability to evaluate enrollees based on pre- and posttests. Continuing education units may be approved and issued based on enrollee successful completion of the program. Other valuable statistical information may be collected to further program development and reporting to University and governmental stakeholders. Courses may be offered with no restrictions to the general public, accessed by specific audiences through registration, or both. Courses may be offered at no charge or fee based.

E-learning platforms (such as Litmos Author, Sum Total, or Microsoft PowerPoint/Articulate) can be uploaded to Campus if they are preferred. Campus is SCORM (Shared Content Object Reference Model) compatible. For added flexibility, the Campus Moodle does recognize many mobile and tablet devices with responsive design and provides clean course elements on most devices.

The process to develop a Campus course involves creating an eXtension account and requesting a Moodle shell from an authorized eXtension representative. To request a Moodle shell, one must: provide a course title; associate the course with a Com-

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munity of Practice; decide whether the course will be instructor or self led, free, fee based or a combination; and outline what participants will learn or gain from the course.

The most important step is developing the course curriculum and becoming familiar with the Moodle shell. Course learning objectives, curriculum, and audience learning style will drive which Moodle activities or resources are incorporated into the course. The course can integrate problem-based learning by branching within modules. Branching enables the course to present scenarios with option choices and feedback on the correct or incorrect choice made. Experiential learning can be incorporated by using games and activities to reinforce learning points.

The eXtension Campus water quality course will include: *Why point the Finger at Nonpoint Source Pollution; Facts, Functions and Figuring Fertilizers; Why Water Wisely; and Smart Spreader Calibration*. Each course contains topic learning modules. For example, *Why Point the Finger at Nonpoint Source Pollution* contains learning modules on: Stormwater Runoff, Nonpoint Source Pollution Environmental Problems, Mitigating Urban Stormwater Runoff, Landscape Best Management Practices and the Nine Principles of Florida-Friendly Landscaping™. The

courses incorporate games and activities to reinforce learning points, and pre- and posttests to measure course impact.

## Results

The eXtension Campus environment provides educators with an alternative instruction method to traditional classroom and field demonstration education. Incorporating problem-based learning and experiential learning encourages participant interaction, reinforces learning points and promotes knowledge retention. Educators can improve reporting and impact appraisals by incorporating evaluation tools. Assessing evaluations, and participant progress and comments provide educators with critical feedback with respect to course review and updates.

Courses are easy to get to due to internet, mobile device, and tablet accessibility. Easy access provides an uncomplicated tool for public education. Readily available courses are vital for professionals seeking to extend their knowledge or obtain certifications and continuing education units in a timely manner. Water quality education is only one example of how eXtension Campus can bring education to the public.