

10-1-2015

Development of a Statewide Web-Based Pesticide Applicator Certification Exam System

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Recommended Citation

Fishel, F., Dowdle, F., Harlow, E., & James, T. (2015). Development of a Statewide Web-Based Pesticide Applicator Certification Exam System. *The Journal of Extension*, 53(5), Article 9.
<https://tigerprints.clemson.edu/joe/vol53/iss5/9>

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Development of a Statewide Web-Based Pesticide Applicator Certification Exam System

Abstract

Beginning in 2010, the University of Florida and the Florida Department of Agriculture and Consumer Services started development of a Web-based system for offering pesticide applicator certification exams in county Extension office. The system offers exam security, minimizes the potential of cheating, and, most important, provides instant exam results, greatly expediting the licensing process. The system has been met with overwhelmingly positive client acceptance and satisfaction. Currently it is in use in 14 of Florida's 67 counties; we hope to expand to all counties in the future.

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Introduction

Federal and Florida law require that applicators of "restricted use" pesticides be certified and licensed. During the mid-1970's, the Federal Insecticide, Fungicide, and Rodenticide Act (USEPA, FIFRA, 2012) was amended to authorize each state to enact a certification/licensing program for these applicators. The regulating agency for this program in Florida is the Florida Department of Agriculture and Consumer Services (FDACS, 2013). For individuals to become certified to purchase, handle, or supervise the use of restricted use pesticides, they must meet competency standards as demonstrated by passing mandated closed-book examinations by 70%.

Exams are conducted by University of Florida/Institute of Food and Agricultural Sciences (UF/IFAS) Extension agents in each of Florida's 67 county Extension offices, and then sent to FDACS for grading and issuance of the license upon passing. Historically, exams have been standard 50 multiple-choice questions in paper format. While this arrangement has been adequate, several aspects have been problematic:

1. Occasionally, exams are stolen, which compromises exams for the entire state, prompting revision, reprinting, and distribution at a cost of approximately \$5,000.

2. There have been incidents of cheating.
3. The exam process can take several weeks before the applicator receives their license.

A secure Internet testing system can overcome some of the complications that have historically faced this paper-based program. Extension professionals have been encouraged to take advantage of Internet resources and other technology resources (Bamka, 2000; Gustafson & Crane, 2005). In 2010, Florida began work on acquiring a new examination system with two primary objectives.

1. Develop an internal, secure Web-based system for administering pesticide certification licensing exams.
2. Eliminate the paper trail created by the traditional exam process and greatly accelerate the entire licensing process.

Although there are other states where applicator certification exams are administered through computers, our system is unique in that it uses a Web-based platform.

Methodology

A USDA-NIFA grant was awarded in 2010 to initiate the development process. Initial funds were used to contract an information technology specialist through UF/IFAS Computer Applications to design the exam system; remaining funds were used to purchase wireless laptop computers for exam administration in county Extension offices. The exam laptop computers have no outside connectivity other than accessing exams and transferring data to FDACS. The system randomly draws 50 multiple-choice questions from a pool each time an exam is selected by the applicant. Of these 50 questions, 10 are drawn by the system from five competency areas, such as label comprehension, safety, pest identification, and other appropriate topics depending upon the subject matter for the particular exam.

Since 2010, FDACS built the registration and licensing system. The registration process can be completed in two steps.

1. Applicants login at <https://aesecomm.freshfromflorida.com/> and enter personal contact information into the registration page to obtain a "voucher" (Figure 1). The voucher may be thought of as the client's "ticket" for taking exams at an Extension office and is a unique number.
2. Applicants then schedule the exam for their extension office online at <https://pesticideexam.ifas.ufl.edu/> (Figure 2).

Figure 1.

FDACS Web Exam Client Registration Page



Figure 2.
Example Web Exam Scheduling Site



Once registered, a client goes to the appropriate Extension office on the date and time selected to take the exam(s). The Extension agent assists the client with logging into the exam laptop, entering their voucher number and last name, and, as final identification verification, holds the client's driver's license until completion of the exam session.

To make the exam more user friendly, several features are available for exam takers.

1. The exam taker can select previously answered questions for review or to change their answer.
2. Referenced materials, such as pesticide product labels, are stored as pdfs and displayed on the screen.
3. A calculator is available on-screen for mathematical computations.

After answering the final question and submitting the exam for scoring, the score instantaneously appears on the screen and is auto emailed to the taker. This initial email serves as the examinee's "unofficial exam result." On the next business day, exam scores are loaded into the FDACS licensing system. At that time an official email is sent to the examinee. The email contains directions for completing and submitting the license application, which may also be processed on the FDACS registration site. The exam taker has the opportunity to review the five exam competency areas to learn where additional study may be warranted for retake of the exam, if necessary, at a future date. The system began β -testing in two county offices in 2013 and has since expanded.

Results and Discussion

We knew that this new process is so radically different from what had been done in the past that there would be challenges in both public and internal acceptance with our Extension educators. To aid clients, step-by-step directions to go through the process have been developed in both written and Web-based format. Also, some of our Extension offices are under local county government authority, meaning there can be connectivity problems due to local firewalls and other security concerns.

During the past year, the project has greatly gained acceptance and momentum by expanding into 14 county Extension offices. Five in-service hands-on training workshops have been held for Extension agents. At each workshop, one of our two β -tester Extension agents and the FDACS Environmental Manager participated as instructors, but also in a testimonial manner promoting the procedure.

Client acceptance has been overwhelmingly positive due to the fact of the immediate exam score availability and expedited licensing process. The ultimate goal is to place at least one exam laptop in each of Florida's 67 county Extension offices. We realize that paper exams are still necessary as there is the occasional person who suffers computer anxiety or unfamiliarity. There are also some very large Extension training events conducted annually on a statewide basis where paper exams remain the only feasible method (Gettys, Fishel, Haller, & Gilbert, 2013).

Implications

Our system is secure in that there is no outside connectivity, rather only a two-way transfer of data between UF/IFAS and FDACS. The possibility of cheating is virtually eliminated due to the randomness of exam questions drawn from question pools and the requirement that all exams are administered and proctored within a county Extension office. Web exams do not offer the opportunity of exam theft; therefore, there is a savings of resources otherwise required for exam development. Any exam revisions may be made in real time by simply entering the system through a secure login and then modifying any questions as needed. Web exams also present an opportunity for Extension agents to educate customers on computer use and perhaps ease computer anxiety in some cases. Above all, customer satisfaction is paramount to any Extension educator; the Web system provides instant results. This Web-based system improves both Extension's and FDACS' service and quality.

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