Computer-Based Instruction: Getting Started in Freshwater Aquaculture

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Situation

The United States Department of Agriculture (USDA) Cooperative Extension Service (CES) is believed to be the world's largest adult and youth out-of-school, nonformal education organization (Fiske, 1989). Preservice and inservice training programs are critical to the success of educators employed by the CES. Inservice training programs for the Purdue University Cooperative Extension Service and the University of Illinois Extension help educators maintain competency in their specific areas of expertise and provide them with information on how to be more effective educators.

Professional development through internal training opportunities is an ongoing process where each CES educator is allocated up to 15 days per year to participate in training programs developed in response to new and ongoing program initiatives by CES. Development of inservice training programs result from the interactions of county and campus staff in responding to the needs of the clientele groups served. University-based content specialists work with other campus staff to provide a listing of staff development opportunities each year to county educators (Seevers, Graham, Gamon, & Conklin, 1997).

Content specialists utilize a variety of inservice training delivery methods, including face-to-face lectures, satellite video conferencing, videotapes, and the World Wide Web (WWW) (D. Petritz, personal communication, May 7, 1998). More recently, computer-based instruction (CBI) has generated considerable interest among administrators, content specialists, and educators as a supplement or replacement to traditional methods of inservice training. CBI offers the potential to increase learning, increase retention, decrease expenditures, and decrease the time required for training (Kulik, Kulik, &Shwalb, 1986).

Action

In 1994 an aquaculture CBI project was undertaken to create a Getting Started in Freshwater Aquaculture training tutorial. The project team consisted of a content specialist in the Department of Animal Sciences with the Illinois-Indiana Sea Grant College Program and a programmer, a graphic artist, an instructional designer, and an editor from the Department of Agricultural Communications Service at Purdue University. The project was completed in 1998 (Swann, 1998). The tutorial was developed using Macromedia Director and consists of CBI delivered on CD-ROM and a 208-page workbook. The CBI is Windows and Macintosh compatible.

The workbook contains the text used in the CBI program and serves as a support document for the computer-based tutorial. The CD-ROM consists of five technical sections, business planning, marketing, water resources, species, and production methods. A sixth section synthesizes each of the sections by allowing the user to navigate through a "day in the life of a fish farmer." The CD-ROM contains 513 photographs, 160 illustrations, 52 animations, 22 digital video clips, and 215 audio files. Calculation tools are provided throughout the program to help educators reinforce difficult concepts. The business planning section provides example of a variety of business planning documents for a variety of species and production systems. The user also has the option to print blank forms for use during the development of business plans.

Experts in the field of aquaculture and CBI evaluated content validity, ease of use, and functionality through a formative evaluation of a Beta product. The production team reviewed the program for reliability and validity. The formative evaluation was not pilot tested; however, questions deemed unreliable and invalid from an earlier formative evaluation of a separate CBI were modified before being incorporated into the evaluation. Where possible, recommendations made by evaluators were incorporated into the final version. One thousand copies of the finished CBI were produced at a cost of $2.19 per CD-ROM, and one CD-ROM is packaged in the back of each workbook.

One thousand copies of the book were printed at a cost of $10 per copy. The Getting Started in Freshwater Aquaculture CD-ROM and book retail for $59.95, with Extension educators receiving a 20% discount.

Result

The primary audience for the aquaculture CBI is Extension educators in Agriculture and Natural Resources. The CBI was provided to every educator in Illinois and Indiana working within agriculture. Educators were receptive to the CBI and have used it for inservice training. As expected during the planning stages, other audiences have purchased the CBI through Purdue University's Media Distribution Center. Records indicate prospective aquaculturists, secondary school educators, and community colleges instructors have purchased copies of the CBI. Three of the primary reasons educators might be receptive to this form of inservice training are the flexibility in scheduling, self-pacing, and the ability to review materials at a later date.

Little information is available on the evaluation of existing CES instructional methods. Fitzpatrick, Duncan, Williamson, and Smith (1997) evaluated the effectiveness of written and audiotaped lessons. The authors suggested that audiotapes were a less effective mode of delivery because agents may not have taken enough time to review the audiotape and the difficulty in relocating sections in a contiguous 70-minute audiotape. In a separate study, Lippert, Plank, Camberato, and Chastain (1998) provided evidence that Extension agents in Georgia and South Carolina were receptive to using the WWW as a means of training a group of professionals who had traditionally depended on more personal face-to-face interactions.

A summative evaluation of the aquaculture CBI provided evidence that achievement, delivery costs, time required for instruction, and educator beliefs regarding CBI for inservice training were favorable when compared with face-to-face lecture instruction (Swann, 1999).

References

Fiske, E.P. (1989). From rolling stones to cornerstones: Anchoring land-grant education in the counties through the Smith-Lever Act of 1914. Rural Sociologist, 9(4), 7-14.

Fitzpatrick, J.N., Duncan, S.F., Williamson, S.A., & Smith, T.A. (1997). An evaluation of two modes of self-paced agent inservice training. Journal of Extension [On-line]. 35(1). Available: http://www.joe.org/joe/1997february/rb5.html.

Kulik, C.-L. C., Kulik, J.A., & Shwalb, B.J. (1986). The effectiveness of computer-based adult education: A meta-analysis. Journal of Educational Computing Research, 2, 235-252.

Lippert, R.M., Plank, O., Camberato, J., & Chastain, J. (1998). Regional Extension in-service training via the Internet. Journal of Extension [On-line]. 36(1). Available: http://www.joe.org/joe/1998february/a3.html.

Seevers, B., Graham, D., Gamon, J., & Conklin, N. (1997). Education through Cooperative Extension. Boston: Delmar.

Swann, L. (1999). Comparison of computer-based instruction with face-to-face lecture as a means of providing in-service training for Cooperative Extension Service educators. Doctoral dissertation, Purdue University, West Lafayette.

Swann, D.L. (1998). Getting started in freshwater aquaculture. West Lafayette, IN: Purdue University Press.