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**CASE STUDY: THE EVOLUTION OF WESTERN INTEGRATED RESOURCE EDUCATION FROM
RURAL BYWAYS TO THE INFORMATION SUPER-HIGHWAY**

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Western Integrated Resource Education (WIRE) began as an integrated, team-taught, farm and ranch resource management course developed and offered by cooperative extension personnel across four western U.S. states. It has evolved into a series of online, Internet courses through more than a decade of adjustments and refinements.

WIRE courses emphasize the process of management—setting goals, priorities, making decisions, planning, budgeting, keeping records and performing evaluations with personal goals and optimization in mind—rather than particular production technologies. The process moves from strategic management outlining where the operation is headed, to tactical management comparing options for getting from “here” to “there”, to operational management where the specifics of how, when, and by whom the management plan will be accomplished.

Currently, courses use a case-study teaching approach and involves students in a number of ways: threaded discussions of course topics, management team meeting interaction on the recommendations made by team members, problem sets to practice using the worksheets and techniques presented, and learning logs to critically evaluate how the material applies to the participant and their personal situation.

Adaptation of course material continues, including: digital video, exploring new ways to engage students, improving evaluation mechanisms, as well as overcoming the occasional “speed bump” encountered on the information highway.

Background

Western Integrated Resource Education (WIRE) is a concept of management which provides practical tools for integrating management of the physical, biological, financial and human resources of agricultural operations. WIRE emphasizes the process of management—setting goals, priorities, making decisions, planning, budgeting, keeping records and performing evaluations with personal goals and optimization in mind, rather than particular production technologies.

(Insert Fig. 1 here)

The process begins by setting goals, which provides the manager with a clear focus on what he/she wants to accomplish through the operation and a view of how it can be done. Managers also need a thorough analysis of where they are and what they have to work with—a thorough inventory of the ranch's current status—physical and financial resources, operator management skills, etc. This is done at the more general or strategic level of management.

Once operators have a clear picture of where they are and where they want to go with the operation, WIRE provides the planning and decision-making tools to get them there. At the tactical level of management, the operator becomes much more specific about enterprises the operation will have, technologies it will use, changes to be implemented, cost in time, labor, and dollars and expected results.

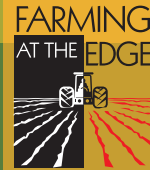
Finally, management plans must be implemented. WIRE deals in detail with the practical, on-the-ground, how-to-do-it questions. At the operational level of management, the operator decides the specifics of how, when, and by whom the management plan is to be accomplished, and how it is likely to impact his/her financial situation. The operator is also provided information on how to monitor the various resources and respond to changes in a positive, proactive way. WIRE gives managers the tools to understand the relationships and interactions of the major ranch resources like soil, water, rangeland, crops, livestock, wildlife, finances, human creativity and labor.

Onsite WIRE courses

Early WIRE courses were team-taught in onsite programs by the Wyoming Cooperative Extension Service agents and specialists who produced the WIRE course materials. Teams of extension personnel in three additional intermountain states in the western U.S.—Idaho, Montana and Utah—were also trained to offer the program. Invited sessions have been offered in Saskatchewan Canada and Queensland Australia as well. Course offerings varied from: 1) six days over two weeks, 2) one day per week over five weeks, 3) evening sessions offered over several weeks, and 4) 48 hours offered in two, intensive, five-day sessions.

When offered onsite, a detailed, six-year case study, based on an actual working ranch illustrates many of the concepts and specifics of the management process. Participants are able to use or adapt many of the planning, record keeping,

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and analysis tools from this practical case study to their own operations. While course content includes some formal presentations, emphasis is on "hands-on" work in small groups or as individuals, with practical problems in agricultural management—some of which may involve financial calculators and computers. Field trips are also included in the course. Technical presentations concentrate on the options used in the case study.

The instructional team is dedicated to teaching the philosophy and process of good management, as well as technical knowledge about the management of various ranch and farm resources. In fact, team presenters are selected with the objective of making the expertise of at least three agricultural disciplines—animal science, range or plant science, and agricultural economics—available at all times while offering the program. Other disciplines and expertise included on the teams included human resource management, wildlife management and irrigation management.

In addition to case study materials, a reference handbook covering each major category of ranch resources is offered. These materials include technical/scientific information regarding the management of specific resources and their use in agricultural operations. The supplied WIRE workbook provides the worksheets participants need to apply this management process to their own operation. Finally, to complete the presentation package, seven, high quality, made-for-WIRE videos were produced to exemplify specific points in the WIRE planning process. These videos show active agricultural producers working to solve or discussing solutions to agricultural management problems.

Online WIRE Courses

After offering a total of 48 onsite courses over a period of eight years in the 1990s, the course was reconstructed on the World Wide Web using the services of the Internet host eCollege (eCollege.com) and OnlineUW (the University of Wyoming Online initiative). Agricultural producers, persons looking to develop profitable and sustainable agricultural enterprises, and University students had all expressed interest in a course available in a more accommodating format. In addition, interest by the teaching faculty and the opportunity to attempt offering Extension programs in a new venue lead to the first online WIRE course offering in May 2000. Eleven separate courses have been offered to date using two alternative formats: 1) a single, fifteen-week course and 2) three, five-week courses. Participants have included degree-seeking University students, persons looking to become or who have only recently become involved in production agriculture, as well as active managers in commercial agriculture.

The challenges of developing an online course are many. However, the overwhelming concern is to engage students effectively in the new environment. For example, case studies are effective when teaching the course onsite. In these settings participants do not have ready access to their own data or are reluctant to share it with others. Conversely, the online environment allows the possibility of student use of their own data where it can be shared privately, directly with instructors. To meet these challenges, the following techniques are used: PowerPoint slide presentations, digital video, threaded discussions, management team meetings, chat sessions, problem sets, quizzes and learning logs. Each mode is discussed further below.

Online Teaching Materials

Drawing from the onsite course presentations, a series of slide presentations was developed as the foundational core for the course. However, simply presenting slides online is not enough. Instructor interpretation and explanation must accompany the slides to aid student understanding of the points listed. This is accomplished using the "notes" section of the PowerPoint presentation program. Audio narration is also provided for each annotated slide.

Videos prepared for onsite WIRE courses were digitized and made available via the eCollege streaming media server. These videos are offered in two formats: one format provides a higher quality picture over high-speed connections, while an alternative format works well when using slower, dialup connections. In addition, to ensure that connection speed does not prevent participants from viewing the videos, a CD-ROM with all course videos is included in a course packet provided to every person enrolled.

Threaded discussions are an excellent mechanism to engage students in an asynchronous dialog in either large or small groups. The tool allows each student to respond either to a question posed by an instructor or to the responses provided

by others in an evolving discussion over a period of time. Questions drawn from slide presentations and other course material are posed in the WIRE course encouraging students to further process key concepts and to provide an opportunity to interact with others about their interpretation.

Management team meetings are a technique used in the course to not only develop key aspects of a management plan for either their own operation or for a case study, but also offer the chance to learn from one another and benefit from the experience each manager (or potential manager) brings to the group. Small groups are created for this activity, allowing students to develop a "relationship" with other members assigned to their team. A discussion thread provides the mechanism for these interactions. Students are assigned specific points of the management plan to post and are subsequently asked to provide feedback on the posts of at least two other members of the four member team. This is an effective method to involve the students in the material, as well as a means to develop a functional management plan throughout the course.

Chat sessions are real-time discussions by members of the class in an online chat room. This tool is used in the WIRE course to give participants an exposure to several outside speakers. Guest presenters offer questions in a session moderated by course instructors to which students respond. This exchange helps demonstrate the value of course concepts, as well as provide a chance to exchange views with others enrolled in the course. Experience with chat sessions suggests these are a powerful way to engage participants. A session is best scheduled early in the course, giving students the feeling that instructors are real people, who are available to help answer questions and explain things as the course progresses. After participating in a chat session, student participation and engagement in the course normally increases.

A chance to practice some of the more technical skills presented in the course is offered through the use of problem sets. For example, a partially complete goal cost worksheet is presented in one problem set. Students are asked to complete the worksheet to demonstrate their understanding of how to calculate the cost of strategic goals. In another example, students are asked to complete a marginal analysis, solving for how much fertilizer to apply to a particular crop. Again the problem sets give participants a chance to demonstrate their understanding of the concepts and the opportunity to practice those skills. Problem sets, coupled with the standard multiple choice quiz, are the more traditional assessment elements of the course. They provide a means of objectively evaluating student mastery of the material.

Finally, the learning log is a technique utilized throughout the course to help students further process what they have learned. The learning log is based on *Action Learning – A Short Guide*, by Quentin Jones of the Department of Primary Industries, Queensland Australia. After completing each major section of the WIRE course, students are asked to respond to the following questions:

1. What major points have I learned in the course? Why?

2. What concepts in this course would I challenge? Why?
3. At this point, what questions do I still have?
4. What do I plan to do with what I've learned in this course?

Upon completion of the course, participants are asked to review their learning logs and to compile a short paper responding to the same set of questions. This paper helps students synthesize the material they have encountered, both as they progress through the course and also as they complete the class and move on to other learning activities. This has been one of the fundamental objectives of the WIRE course since its inception—to help students frame their course experience and to understand how it fits into the context of their day-to-day lives.

Student Response

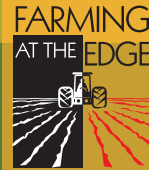
Participant reaction to the online WIRE course has been positive. Recent student comments include:

- *"I liked the fact that it was online and we were free to go to class or do our assignments when we had time and when it was good for us. I could work more this way. The instructors were available to us when we needed them."*
- *"I was kind of leery going into it because I'm the kind of person who needs someone to 'show' me how to do some things, and though the presentations in each module contained quite a bit of information, they were very clear."*
- *"[I liked] the integrated and paced way in which the course was presented. I also liked the continuing learning theme of the course."*

After completing the course, the CEO of a major U.S. corporation wrote, *"Several months ago, I was completely adrift in my farming/ranch operation. I found this WIRE course on the Internet. You may say for someone who runs thirteen businesses and employees hundreds, this [course] was a piece of cake. No it was not, but about the best program of its kind that I have ever heard of. What did I learn? Let me tell you."* He continues with six additional pages outlining what he gained from his participation in the course. Another student, from a working farm in eastern Wyoming wrote, *"The Strategic Goals idea is a good way to plan for the future. I would have liked this complete course when I was twenty-five years old instead of sixty-plus. The time frame that is used for the course is about as good as could be utilized. I had about a week of corn combining overlap, which did not bother anything. Doing this work in a busy farming/ranching season would not be fun."* Out of those that have completed the online course so far, these last two certainly have the life-experience to put the material into its proper perspective. We cite their comments not so much to advertise the course, but rather to demonstrate that the online learning environment can be effectively used to reach people who are actively involved in farm and ranch management.

Although the process of taking an extension course from being offered in the rural byways to the information super-highway can present many challenges, the success of reaching even one student who would not have otherwise had

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access to the material can make it a worthwhile effort. For more information on WIRE programs see: <http://agecon.uwyo.edu/wire>.

Biographical details

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