

Applying Principles of Adult Education Theory to a Professional Development Program for Watershed Group Leaders

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Abstract

This paper addresses best education practices for building the leadership capacity of collaborative watershed management groups. We explore the results of applying principles of adult education theory to a distance education course for watershed group leaders. The Ohio Watershed Academy, in its fourth year, is designed to build the capacity of watershed group leaders to facilitate the development and implementation of community-based plans that address water quality impairments. Curriculum development and course design were based on four principles of adult education (Merriam and Caffarella, 1991):

- Life experience as a content/trigger to learning
- Self-direction and autonomy
- Self-reflection
- Expression of learning

The course design includes two major components: face-to-face workshops and web-based instructional modules. The workshops provide an opportunity for peer-teaching, based on student designed team learning projects. The web-based modules allow students to complete assignments from the office, but also require students to interact with stakeholders. Elements of adult education theory evident in the course design, include:

- Entry interviews with students to assess and co-create learning objectives.
- Flexible scheduling and selection of assignments to match students' work experiences and learning objectives.
- Numerous opportunities for reflection on practice.
- Opportunities for peer teaching.

Data on student reactions and changes in knowledge, attitudes, and skills were collected through surveys and interviews over a three year period. We found gains in knowledge and skills were most evident in the area of stakeholder participation. Implications for course design include providing opportunities for peer interaction and student-designed learning activities.

Origins of the Ohio Watershed Academy

All across the United States, watershed collaboratives are forming to address water resource management issues. In Ohio, government agencies are encouraging the formation of watershed collaboratives for the purposes of developing and implementing comprehensive watershed management plans. In 2000, the Ohio Environmental Protection Agency (OEPA) and Ohio Department of Natural Resources (ODNR) created a grant program whereby watershed collaboratives could hire full-time Watershed Coordinators to lead local stakeholders in developing watershed management plans. Recognizing the need to provide some basic training in collaborative planning for these new positions, administrators from OEPA and ODNR approached Ohio State University Extension about creating a professional development course in collaborative watershed planning for Watershed Coordinators and other interested watershed group leaders and participants. The Ohio Watershed Academy was thus created with funding from OEPA using federal dollars under the Clean Water Act, Section 319.

Course Design

The purpose of the Ohio Watershed Academy is to develop the capacity of students to facilitate collaborative watershed planning efforts by introducing them to some of the basic elements of collaborative watershed planning. The following topic areas are covered in the course curriculum:

- Overview of watershed planning
- Group facilitation
- Running effective meetings
- Understanding water quality criteria
- Developing problem statements
- Creating a watershed inventory
- Designing effective outreach programs

The majority of coursework is conducted at a distance, with students working through a series of instructional modules, submitting assignments electronically via the Internet using a Web interface developed by technicians in the Section of Communication and Technology in the College of Food, Agricultural, and Environmental Sciences at The Ohio State University. Instructional modules and corresponding assignments are posted on the Ohio Watershed Academy Web-site and include learning objectives, an introduction to the topic, required and recommended readings, and a description of the assignment(s) to be completed by the student. Instructional modules can be viewed on the Web at the following URL: <http://ohiowatersheds.osu.edu/owa/lessons/>.

In addition to the standard assignments, students also complete two in-depth learning projects during the five-month course. Students are encouraged to work in pairs or small groups on a watershed-related topic of their choice. Students develop their own learning objectives, activities, and products. A summary of the in-depth learning projects is presented to the class and posted to the Academy Web-site.

The third component of the course involves face-to-face meetings where students have an opportunity to get together for presentations from invited speakers and share the outcomes of their in-depth learning projects. These meetings also provide students with time to build social networks and share experiences with peers.

The Audience

The first class of thirty-nine students began in December of 2000. A total of four classes (60 students) have since graduated from the Ohio Watershed Academy. A majority of the Academy students are full-time Watershed Coordinators who are required by their grant sponsors (OEPA and ODNR) to write a watershed action plan in collaboration with local stakeholders. Some students are not Watershed Coordinators, but are employed in teaching, soil and water conservation, planning, and other related professions. A few students are engaged in unrelated professions and became involved in watershed planning as volunteers. The age, years of resource management experience, and academic and professional background of the Watershed Coordinators varies widely. Some have retired from their first careers, while others are in their first professional position after college.

Curriculum Based on Principles of Adult Education

The curriculum and course design were developed by a team of staff at OSU Extension. An external multi-disciplinary and multi-stakeholder Advisory Committee provided feedback on course design and developed many of the instructional modules. Both the content and overall design of the course were created with the following four components of adult education in mind (Merriam and Caffarella, 1991):

- Life experience as a content/trigger to learning.
- Self-direction and autonomy.
- Self-reflection.
- Expression of learning.

Merriam and Caffarella (1991) proposed these four components based on a thorough review of adult learning theory in their book *Learning in Adulthood*. Below, we provide a brief explanation of each principle and offer examples from the Ohio Watershed Academy.

Life Experience as a Content/Trigger to Learning

Adults bring a wealth of life experience to the learning environment. This can present both challenges and opportunities to the educator. On the one hand, adult students' experiences can enhance opportunities for peer teaching. On the other hand, students often come to the learning environment with widely varying levels of knowledge and skill. One of the challenges faced by the designers of the Ohio Watershed Academy was how to develop a curriculum that would be challenging for the more experienced students, without overwhelming the less experienced students. We also wanted to provide ample opportunities for peer-teaching to take advantage of the collective knowledge of the group.

Adults tend to seek learning experiences that increase their proficiency in their life roles (Knox, 1980). While some of the Academy participants were required to complete the course as a condition of the grants that funded their positions, we have never doubted that our students were motivated to be effective in their roles as leaders and facilitators of collaborative watershed planning efforts. We describe later in this paper how the Academy course was modified to allow students to personalize their own learning experience to match their work-related responsibilities.

Self-Direction and Autonomy

Knowles (1980) proposed that as learners mature, they become increasingly self-directed. According to Merriam and Caffarella (1991), the major motivators for engaging in self-directed learning are control, freedom, and flexibility. Adult learners prefer to set their own learning pace and experiment with alternative learning strategies. In designing the Ohio Watershed Academy we struggled to strike a balance between exposing students to a broad range of topic areas in a logical sequence on the one hand, and allowing students to select topic areas most relevant to their life experiences when those topics were most salient. As we discuss in a later section, we modified the course design over time to allow students more control and flexibility.

Self-Reflection

Some scholars, most notably Mezirow (1981) and Freire (1970) have posed that adult learners, more so than children, are capable of transforming their perspective and assumptions about the world around them as an outcome of the learning experience. These new perspectives can lead the learner to develop new and more effective approaches to solving problems. We attempted to incorporate opportunities for self-reflection throughout the Academy curriculum. Many of the assignments encouraged the students to reflect on how their watershed group functioned, how decisions were made, and who was involved in those decisions, and the instructors challenged students to consider their own biases and assumptions.

Expression of Learning

Adults often seek out learning experiences in order to be more effective in their life roles. It is therefore natural that adult learners would be anxious to express their new knowledge and skills through action. This is especially true when the subject area is directly and immediately relevant to the educational needs of the learner. In developing the Academy curriculum, we attempted to design the instructional modules so that, in the process of completing assignments, students would be creating products (e.g., lists of potential stakeholders, problem statements, and data collection goals) that would have immediate application to their watershed planning effort. Evaluations indicate mixed results with respect to direct application of learning to watershed planning efforts. More recently, we allowed students more flexibility in choosing which assignments to complete and in what order, and incorporated in-depth learning assignments which allowed students to design their own learning experience to address a work-related issue. We discuss these adaptations in greater detail in a later section.

Early Experiences: Academy Classes I-III

Between the Spring of 2000 and Summer of 2003, an extensive formative evaluation process was conducted on the first three Ohio Watershed Academy courses. Evaluation questions were developed by OSU Extension staff with input from an advisory group made up of representatives of funding agencies (OEPA, ODNR) and other stakeholder groups (e.g., watershed collaboratives) and non-formal educators. Several methods were used to collect evaluation data, including written and on-line surveys and phone interviews (see Appendix A for sample questions). A total of thirty two written surveys (89% response rate) were completed by students from the first two courses. Phone interviews were conducted after each of the first three Academy courses. A total of twenty seven interviews were conducted with participants who volunteered to be interviewed.

An evaluation framework, based on Bennett's Hierarchy, a widely used Extension program evaluation and planning model, was used to generate evaluation questions. We were interested in learning not only how participation in the Academy affected students' knowledge, attitudes, skills, and aspirations, but also how the structure, design, and delivery of the program enhanced or detracted from the learning experience. In other words, we wanted to know if we were offering a quality learning experience. The following discussion highlights the evaluation findings from the first three Academy classes in relation to the four components of adult learning introduced earlier.

What Worked?

Overall, Academy students reported having a positive learning experience. One of the most popular aspects of the course was the opportunity to meet and network with peers (other watershed coordinators and watershed group leaders) during face-to-face meetings. Collaborative Watershed planning is a relatively new field; there are no universal manuals or blueprints for success. Under such circumstances, learning from the trials and errors of others is a key learning strategy for many Academy students. Students also appreciated the camaraderie provided by the Academy meetings, as indicated in the following quotes taken from student questionnaires:

“I enjoyed having the opportunity to discuss topics with other coordinators. It gave me insight into the operations of other groups.”

“I really think the networking/moral support was beneficial, especially as some of us work by ourselves.”

One of our primary objectives in designing the Ohio Watershed Academy curriculum was to support the students in fulfilling their work responsibilities. Feedback from students indicated that assignments did have direct application for some students. For example, one student indicated,

“Some of the instructional modules came at very good times where our organization was dealing with a particular topic related to the modules.”

Another student benefited from the instructional module on running effective meetings:

“A lot was helpful, particularly the meeting facilitation agenda form. The first Board meeting after the assignment, the members noticed an increase in organization immediately.”

Other students indicated that portions or all of some assignments would be used directly in their watershed plans or other reports.

When asked if the Academy addressed the students’ most pressing professional needs, the majority of respondents indicated that it had. Some of the areas in which students reported the Academy was helpful included:

- How to get input from the public.
- Instilling leadership.
- Emphasizing the need for broader stakeholder involvement.
- Making progress on developing a watershed plan.

Gaining New Perspectives

One of the most interesting evaluation findings was evidence that participants in the Ohio Watershed Academy gained new perspectives on watershed planning through self-reflection and instructor feedback. Several students reported having gained an appreciation for the importance of involving more stakeholders, as expressed in the following quote:

“In my watershed ... I’m looking at expanding the Board to include more stakeholder groups (e.g., health departments, chamber of commerce). These ideas came from the readings – the idea of a more diverse Board and the idea of an array of stakeholders in planning.”

In providing feedback on written assignments, the instructors encouraged students to consider alternative viewpoints and reflect on their biases and assumptions. This feedback apparently had the desired effect for some students, as indicated in the following quotes:

“The instructor feedback was an essential part of the class where different points of view were made that may not have been this obvious.”

“Feedback was very helpful for me to see the entire picture of watersheds.”

“The Academy made [me] stop to evaluate myself as to where I was with the development of the watershed group.”

In summary, students who participated in the first three Ohio Watershed Academy courses reported having a positive learning experience. In relation to Merriam and Caffarella's (1991) principles of adult learning, the Academy allowed students to use their professional situations as a trigger and content to learning. The Academy also provided students with an opportunity to reflect on and alter their perspectives on watershed planning in general and stakeholder involvement in particular. The direct application of some assignments to job responsibilities, in some instances, allowed students to express their learning through their professional roles. One component of adult learning that did not emerge as a strength from the evaluation results was autonomy, or self-direction in learning. This was one of the areas we sought to improve in the fourth Academy class.

Room for Improvement

Evaluation results from the first three Academy classes also turned up areas where there was room for improvement. Of greatest concern to the instructors was the number of students who withdrew or simply did not complete all the assignments – a requirement for graduation. Among the third class of twenty registered students, only eleven completed the course. In October of 2003, phone interviews were conducted with five (of a total of nine) Academy participants who interrupted participation before graduation (see Appendix A for example interview questions). Respondents' primary reason for not completing the Academy was lack of time, both for completing assignments and attending face-to-face meetings, which were held in the Columbus area. While participants who did not complete the Academy generally had favorable opinions of the course and many expressed an interest in completing the course at a later date, one respondent felt that the course content was tailored too much toward watershed projects still in the planning phase, and not enough toward projects that had moved into the implementation phase.

As mentioned in the introduction, students came to the Academy with widely varying backgrounds and levels of experience. Initially, students had very little flexibility in choosing which instructional modules (and corresponding assignments) to complete or the order in which they would be completed. As a result, some students found some of the modules to be too basic, while others found the same modules very challenging. Just as students enter the Academy at different stages of development as professionals, the watershed projects they are involved in are also in varying stages of development. By forcing students to complete the instructional modules sequentially, beginning with the basics of watershed planning, and ending with evaluation of project outcomes several months later, many students found that the assignments they were working on at any given time did not always coincide with their immediate work responsibilities. Referring to the instructional modules, one participant noted:

“The first half were great and relevant regardless of where a group was in the planning cycle. The second half were very dependent on where a group was in the cycle and were less directly useful if they did not correspond with where the group was.”

Based on the feedback from students, several adjustments were made to the second and third Academy courses. In order to reduce the work load, the course was lengthened by a few weeks to allow the students more time to complete each assignment. To accommodate varying skill and knowledge levels, optional advanced assignments were added to some instructional modules. Evaluations from the third Academy class indicated that more radical changes were needed to address the issue of excessive time commitment and tailoring of the learning experience to meet professional demands. These changes were incorporated into the fourth Ohio Watershed Academy class and are described in the next section.

Academy IV: Moving Toward a More Learner-Centered Design

The fourth Academy course began in January of 2004 with a class of 27 students. Several months before the class began, OSU Extension staff reviewed the formative evaluation findings from the previous three classes. Two areas requiring significant adjustments were identified: 1) the workload was still too great for many students, and 2) participants were calling for more self-direction in choosing which assignments to complete and in what sequence to complete them. To address the first concern, the course was shortened from over six months to four. Also, students would no longer be required to complete all the assignments, but would choose ten of a total of nineteen assignments to complete, based on their personalized educational objectives, which were co-created with the instructors during pre-course phone interviews. The pre-course phone interviews were adopted for the fourth class in an attempt to clarify expectations (e.g., time required, course content) on the part of both student and instructor before potential students committed to participating in the course.

Another innovation developed to allow students more self-direction in creating their learning experience was the in-depth learning project. The in-depth learning projects were designed by the students at the first orientation meeting and again at the second mid-term face-to-face meeting. The projects could be completed individually or in teams. Students worked with the instructors to identify learning objectives, activities, and outcomes (products in the form of presentations or materials that could be shared with the other students). Students presented the outcomes of their in-depth learning projects to their fellow students and invited guests at the mid-term and final face-to-face meetings. The purpose of the in-depth projects was not only to give students an opportunity to explore a topic of particular relevance to their current work responsibilities or interests, but also to give students an opportunity to express their learning through peer teaching. A brief description of the in-depth learning projects and the outcomes of those projects (e.g., slide presentations, summary findings) can be viewed on the Ohio Watershed Academy Web-site at <http://ohiowatersheds.osu.edu/owa/students/projects-2004.html>

At the time this paper was written, the fourth Ohio Watershed Academy course was still one week from completion, but interim evaluation results indicate that students greatly appreciated the flexibility allowed in selecting assignments, both in terms of which assignments would be completed and the sequence in which assignments would be

completed. Although students were required to select their assignments at the initial orientation meeting, several students made adjustments to that schedule throughout the course based on emerging issues in their work and in their watersheds. Interestingly, the percentage of students withdrawing from the fourth class remained relatively high (40%). Most of the students cited heavy workloads, busy lives, and job changes as reasons for withdrawing. No one cited dissatisfaction with the course as a reason for withdrawing, though a few did not communicate any reasons for withdrawing.

Conclusions

Educational programs that target water resource management professionals can be designed with the needs and characteristics of adult learners in mind. In designing the Ohio Watershed Academy, we have strived to:

- respect the pre-existing knowledge and life experiences of our students,
- provide them with opportunities to critically reflect on their practices and express their learning, and
- create opportunities for building professional relationships.

Evaluations from the first three classes provided us with valuable information about the program's strengths and weaknesses. Based on student feedback, the strengths included:

- Relevance of course content to professional roles.
- Exposure to new perspectives on watershed planning, particularly related to stakeholder participation.
- Opportunities to network and socialize with other watershed professionals.

Evaluation results also indicated that we needed to give students more flexibility in choosing which instructional modules to complete and give them more freedom to explore specific areas of interest. As a result, we allowed students in the fourth Academy class (January-May, 2004) to choose which instructional modules they would complete and in the order that would best match the content of the modules with their job responsibilities. We also added a new component to the course design: in-depth learning projects, that allow each student, individually or as part of a team, to identify and explore topic areas of special interest and relevance to their role in watershed planning. Students presented the results of their projects to their peers at two face-to-face meetings.

Recommendations

Developing educational programs is similar to watershed planning in the sense that effective educational programs must be appropriate to local context and adapted over time based on trial and error. Therefore, our strongest recommendation for developing non-formal watershed education programs for adults is to design a thorough structure for formative evaluation using multiple methods to gather feedback from students on their experiences. Methods we have found useful include on-line feedback forms accessible every time the students submit an assignment, written forms completed at face-to-face meetings, and phone interviews. Over time, in response to evaluation results and our own self-reflection, we have attempted to provide our students with greater autonomy in determining the content and timing of learning activities. We have challenged them to

question their assumptions about watershed planning and we have created more opportunities for students to identify and address their own educational needs through in-depth learning projects. In summary, we have attempted to create an educational program that will lead our students through a process of self-discovery and leave them with a greater capacity to address their own professional needs in the future. We also acknowledge that, as educators, our own process of self-discovery and learning is ongoing.

References

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Appendix A: Example Evaluation Questions

Phone Interviews

(Students were interviewed two months after the Academy had ended)

- Please describe your experience with the Ohio Watershed Academy.
- What questions did you have during your experience?
- What was helpful?
- Was anything a hindrance?
- Do you feel the Academy helped build confidence and/or interest in your role as a watershed coordinator?
- What educational needs are not being addressed in the Academy?
- If you could go back and change anything about your experience, what would you change?
- Can you think of three things you learned during the course that helped you in your role as a watershed coordinator?

For participants who did not complete the course:

- What was the primary reason you were not able to complete the Academy?

On-line survey

(Students were given the opportunity to respond to the following questions after completing each instructional module)

- Were the assigned readings sufficient for completing the assignment in this module?
- Were the instructions presented clearly?
- Do you feel the assignments in this module are helpful to you as a watershed coordinator?
- Do you feel that by completing this module, you are better equipped to make progress toward your watershed plan?

Formative evaluation (Students were asked mid-way through the Academy to write reflections about their experiences)

- What is working about your Academy experience?
- What is not working about your Academy experience?

Written survey

- Please describe your overall experiences with the Academy.

To what extent...	Not at all	Fully	Not Applicable
... did your Academy experience address your main educational need?			
... did the Academy assignments help you address your job responsibilities relative to watershed planning?			
... were you exposed to new ideas during the Academy?			
... did you experience belonging to a community of learners during the Academy?			
... did you experience a sense of collegiality with your fellow Academy students?			
... did the Academy provide you an opportunity to network?			
... did the Academy provide you with useful examples from other watershed groups?			
... did the format of the Academy provide you with sufficient flexibility?			
... did the Academy provide you with specific tools you were looking for?			

- Please mark an X in the box that best represents your experience with the Academy assignments. (Note: Other, similar questions using a semantic differential were included in the written survey to measure participants' perceptions of readings, in-depth learning projects, face-to-face meetings, interactions with peers, and instructors. For an explanation of semantic differential scales, see Hopkins, (1998).

Overall, assignments were...

Disorganized		Organized
Not informative		Informative
Not Helpful		Helpful
Waste of time		Worth the time
Not useful for my job		Useful for my job

Theoretical		Practical
Difficult		Easy

- As a result of your participation in the Academy, to what extent has the following expanded?

To what extent...	Not at all Expanded	Fully Expanded
a. My professional network		
b. My sense of belonging to a professional community		
c. My knowledge of resources available from OSUE (The Ohio State University Extension)		
d. My knowledge of resources available from OEPA (Ohio Environmental Protection Agency)		
e. My knowledge of resources available from ODNR (Ohio Department of Natural Resources)		
f. My knowledge of resources available from other organizations (other than OSU, OEPA, ODNR)		

- What was the most significant experience you had during the Academy?
- If you have established a new relationship as a result of your participation in the Academy, please describe the nature of the new relationship.
- What new skills did you gain as a result of completing the Academy, that have been **most useful or beneficial** to you (your work and/or life experiences)?
- How would your plan or planning process be different without your participation in the Academy?
- Has the Academy helped your watershed group sustain itself organizationally and/or financially?
- Please, give one example of how you have used the products from assignments and in-depth learning project.
- Please, give one example of how you have brought the lessons learned from the Academy modules to the community.