

January 15, 2004
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Teaching Up A Creek
Bryant Watershed Project

Final Assessment

Bryant Watershed Project (BWP) funded “Teaching Up a Creek”, which focused on furthering knowledge about water quality in the Ozarks. This project provided Southwest Missouri State University (SMSU) – West Plains students with an opportunity to teach, two days, in a 5th grade public school classroom using hands-on activities about our precious Ozarks natural water. Students chose topics including stream biodiversity and the use of macroinvertebrates to indicate water quality, watershed responsibility and the role humans’ play in point source pollution, non-point source pollution and stream protection, and lastly, karst topography as it relates to groundwater susceptibility to contamination. Following preparation time on campus, students worked as a team to teach their topic to 5th grade students from surrounding county schools. Students gained experience in activity based teaching and received professional evaluations from the 5th grade classroom teachers.

The improvement in scores from a pre- post-quizzes given to 15 area 5th grade classrooms, showed an overall improvement of 84%. Breaking this down by schools: Dora 92%; Alton 76%; Ava 75%; Mountain Grove 97% all showed improvement. SMSU students also showed an improvement in scores with a 29% increase from a pre- to post-quiz.

Project design included Southwest Missouri State University students gaining knowledge about water concepts and activities and then sharing those activities with surrounding county 5th grade classes. A total of 42 presentations were given by seven SMSU students to 290 5th graders in 4 area schools, involving 15- 5th grade teachers.

Dave Mayers and Debra Mayers also gave presentations to fill in when the need arose. That made overall number of presentations totaling 48.

“Teaching Up a Creek” was designed with prospects of knowledge being gained across the board, including classroom teachers, SMSU students and 5th graders. Three months prior to the event, public school teachers were recruited and sent concise pre-activities and vocabulary lists in order to prepare their students for the SMSU students’ visit. Activities were designed by Debra Mayers in addition to usage of the Bryant Watershed Project website. Teachers were referred to the website to view the Karst movie and do website activities which accompany it. The website was also used for access to the macroinvertebrate movie. Debra developed a game to follow viewing the macroinvertebrate movie. Use of the BWP website seemed beneficial for a few reasons. First, the 5th grade teachers could pass it along to the computer resource teachers to do with their classes. Secondly, it did not involve gathering up materials for an activity, or the related expense of doing that. Third, it introduced teachers to the BWP website. From SMSU student’ research on water quality topics, it became known that the BWP website is one of the most referred to websites on water quality and education, a good thing to know, as pre-service teachers. The third pre-activity was based on an American Fisheries Society poster titled “Your Watershed Matters” and involved some reading and presentation skills for the 5th graders.

The second major step in project design included development of the actual activities. Project WET (Water Education for Teachers) served as a reference for the activity on macroinvertebrates and diversity – “Macroinvertebrate Mayhem”. This activity involved assigning roles to each student as a certain macroinvertebrate with

specific tolerances for pollution. The activity showed how macroinvertebrate diversity and water quality decrease with pollution. An activity on point source and non-point source pollution and Best Management Practices – “Sum of the Parts” was also selected from Project WET. This activity demonstrated how everyone contributes to the pollution of a river as it flows through a watershed within which they were the property owners. Both activities involved slight adaptations for time frame and clarity. The third activity titled “Karst, Caves and Groundwater Contamination” was developed by Debra Mayers. With this activity, students hypothesized about the volume of water passing through soil with models representing a stable soil type and karst soil. It demonstrated the increased susceptibility of groundwater in karst regions. The presentations also involved large group opening and closing activities. The opening activity involved 3 classes of 5th graders at a time, and was titled “Water Words”. It was designed by David and Debra Mayers. With this activity, seven posters with titles of water quality concepts and twelve associated clues were posted around the room. Each student was given one or two clues and told to match it up with a poster. The group of students at each poster then decided on the two best clues. The closing activity was taken from Project WET – “The Thunderstorm” and again involved 3- 5th grade classes at a time. The 5th graders simulated the coming and going of a thunderstorm, as part of the water cycle, through whole body sounds of snapping, clapping and stomping.

Day one and two of SMSU class meetings focused on experiencing the activities, preparing materials and scheduling the public school teaching days. The final meeting with the SMSU students involved gathering up any reusable materials, statistically

evaluating the pre- post-quizzes, discussing Teacher Assessments of SMSU students and accepting final evaluation papers.

Looking back on project development, planning and execution some changes may have been beneficial. Recruitment of public school teachers appeared relatively easy with the actual level of dedication unknown. Some teachers kept in close touch and had made sure that all activities were done, prior to the SMSU students' arrival. It appeared most teachers attempted to do the activities. It may have been possible to have 5th grade teachers fill in a questionnaire concerning their opinion of the pre-activities and find out if they actually did them or not. This may have reflected on post-quiz results as well. Placing teachers on a waiting list seemed to discourage them from planning on doing the pre-activities, and waiting until the last minute. In preparation of the SMSU students for their classroom experience, initially, three days were planned for this aspect of the project. I think everyone involved at this point would have felt better, and all would have run more smoothly, had three days been available. More time should have been available to assure SMSU student had a thorough understanding of the concepts. The original objectives included peer evaluation, which did not occur due to time limitations. This might have built up confidence, especially to those who had not taught prior to this time. Rather than cutting schools out of the program, the schedule was redone to spend two days teaching, rather than one. This proved to be beneficial to the SMSU students involved by gaining more teaching experience, as they expressed in their overall evaluation papers. Fortunately, the dedication of the SMSU students' was such that they were willing to put in extra time, in order to be prepared for their teaching experience. A possible solution would have been to offer the class for 2 credits and meet for 6 hours a

day instead of 3. That may, however, have limited enrollment for students who work part-time or might be unwilling to pay for a 2nd credit. Offering the course at the end of the spring semester would work for the public schools but may limit enrollment of college students who work summer jobs or don't take summer classes. I suppose an option might be to actually hire them as temporary labor where they gain the experience, but don't receive college credit.

Bryant Creek Watershed Project was most supportive in the initial phase of developing overall objectives, contact information for public schools, and website advertising. It was beneficial to have the freedom to develop activities and work with SMSU-WP on the details related to the actual mechanics of the project. I found that support for TUC was quickly available from BWP when requested. Turnover of reimbursement for expenses and items needed was very fast.

Teaching Up a Creek was a great success in terms of knowledge gained by 5th graders and the SMSU college students about water quality concepts. Teaching experience and evaluation by current public school teachers was most rewarding for the college students, also. Some even expressed a desire to have more time to teach. They enjoyed the activities and gained some understanding of teaching hands-on with a group of young learners. Asking the 5th grade teachers to evaluate the SMSU students didn't always work as requested. Some teachers only evaluated them once, since they were teaching the same lesson over. Other teachers stayed in their classroom rather than moving with a group of 5th graders and only got to see one SMSU student present. I think clarification as to what was expected from the public school teachers concerning

that request, was needed. Not all schools manage their students in the same way, so it needs to be developed specifically for each school.