Authentic Learning in Educational Leadership:
Aspiring Principals Helping Schools Analyze Student Data

Philip A. Griswold
East Stroudsburg University

A graduate course required for principal certification was restructured to illustrate authentic learning in partnership with local school principals. In this data driven decision-making course, students, principals, and the professor collaborated on problem-based learning tasks. At the end of the course, the aspiring principals identified school instructional needs, accessed and analyzed district student data, and made decisions that were reported to the participating schools. The graduate students valued the experiential nature of the school-university partnership. They learned the difficulty of defining a feasible evaluation question and accessing appropriate data. These aspiring principals mastered the basics of two data analysis software tools. They became confident in using data and were convinced that more effective decisions can be made when clearly defined questions are answered based upon appropriate data. All graduate students admitted to initial trepidation with the unconventional ambiguity they dealt with, but overcame it with patience and practice to achieve an understanding of authentic learning.

Key Words: Educational Leadership, Principals, School Partnerships, Problem-based Learning

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"When you're talking about it, you ain't doing it." --Ella Fitzgerald
(cited in Bruner, 1996, p. 151)

Background

Historically, the application of psychology to education relied on behavioral learning theories (Fetsco and McClure, 2005; Woolfolk, 2004). The current understanding of the learning process is undergoing great change as described in the well-documented history of cognitive psychology (Gardner, 1985). Neither more reductionism nor computer models have adequately explained cognition, because they exclude "the role of the surrounding context, the affective aspects of experience, and the effects of cultural and historical factors on human behavior and thought" (Gardner, 1983, p. 387). The new theories of learning emphasize mental or cognitive structures — private knowledge, thoughts, and ideas.

Learners build their own cognitive structures when interacting with the environment through hands-on activities oriented toward design and discovery (Piaget, 1978). Social interaction between the learner (the novice) and the teacher (the expert) is a source of learning (Vygotsky, 1978). The importance of this social link was expanded to include more than only a novice and an expert, but a community of learners. The context contributes to a synthesis of private mental representation, reflection on one's action, and sharing the learning process and its outcomes within the community of learners. Brown, Collins, and Duguid (1989) referred to this scenario as situated learning. In this view of learning, reality is represented by a symbol system shared with members of a learning community. To learn the appropriate symbol system (the learning tools) for the situation is to do authentic learning.

Authentic Learning

This new theory of authentic learning leads to very different approaches for the design of curriculum, teaching methods, and assessment than those found in schools and colleges. Like Dewey (1922), Wenger (1998) viewed learning as social engagement with others to develop an identity with them. In other words, learning comes from doing and talking about our experiences. From that learning, we create a personal history, an identity, in the context of the learning community in which the learning is taking place. What we learn is a function of who learns it with us.

The act of educating is not just applying learning theories to the classroom. It is a complex pursuit of fitting a culture to the needs of its members and of fitting its members and their ways of knowing to the needs of the culture (Bruner, 1996). This new understanding of learning is dramatically different from what is seen inside schools and colleges (National Research Council, 2000; Wildman, 2005). Rather, schools and colleges must be communities of learners, where clear connections are made to real situations outside the classroom. Students have to go beyond the classroom to the authentic situations of the learning.

I refer to this new learning as authentic learning, which applies to all levels of education. How to encourage authentic learning among educators, to fold it into instruction, and to build it into curriculum, needs investigation. Education should be shifted from relying on "learning in the head, [to engagement through] social practice" (Wildman, 2005, p. 21). Restructured courses and programs are better centered on collaborative, problem-based work, than on traditional instruction focused on independent, instructor-centered classrooms. The situated nature of this learning suggests that acquiring that understanding should occur within a learning community. The process should be student-centered, collaborative, and grounded in real problems.

Educational leaders are responsible for hiring and supervising teachers whose work should reflect authentic learning. Those aspiring to be leaders must have effective opportunities to acquire the principles of authentic learning, reflect on them, and practice them. How do we help educators to understand authentic learning and to develop their changing roles? Traditional professional development and graduate study for teachers and principals has been subject to criticism. Specifically, participants in graduate leadership preparation programs are often critical of traditional, theoretical, and anecdotal elements of the curriculum (Farkas, Johnson, Duffett, Foleno, and Foley, 2001; Murphy, 2001).

Alternative education and training approaches have been proposed, but the amount of research to support the effectiveness is modest (Lashway, 2003; McCarthy, 2002). Murphy (2001) specifically viewed the preparation of educational leaders to be recast to include their role as educators. Not surprising, then, is the connection of principal training to professional development orientations (Daresh, 2003; Fenwick and Pierce, 2002). The traditional model exposes the learners to the research base on management and behavioral sciences. In the craft model, experienced practicing principals, through internships and field experiences, provide practical knowledge and skills. The reflective inquiry model characterizes principals as active participants in a process of systematic study. Furthermore, the more successful professional development activities take place over time, encourage the development of communities of learners

and focus on shared decision-making" (National Research Council, 2000).

In reaction to criticism, a different approach to principal preparation has emerged. In concert with new perspectives on professional development and situated learning principles, a problem-based learning approach emerges. Like the concept of authentic situated learning, problem-based learning follows from the assumption that the strongest way to prepare educational leaders for the dilemmas that will confront them in their school culture is to immerse them into real school problems (Hallinger, 1997). Problem-based learning was introduced in medical education and adapted to leadership education. Students, in small teams, are confronted with a problematic situation that they are likely to encounter as school leaders. "Students… collectively decide on a course of action, implement their decision, and experience the consequences of their actions" (Bridges and Hallinger, 1997, p. 133).

Given the demands made by the *No Child Left Behind Act [NCLB]* (Congressional Record, 2001) and the professional expectation for skills of data analysis (Jandris, 2001; National Policy Board for Educational Administration, 2002; Schmoker, 1996), making decisions using real student achievement data would be a useful way for educational leaders to experience authentic learning. Relevant professional development activities would include identifying a problem worth studying, developing a derivative question, answering the question with appropriate data, and then making some practical decisions supported by data. Consistent with a problem solving model (cf. University of Deleware, undated; Bridges and Hallinger, 1997), data driven decision-making is focused on student centered, context-specific, and experiential learning (cf. Brown, Collins and Newman, 1989;

Cordeiro and Campbell, 1995; Tanner, Keedy, & Gali, 1995).

Several assumptions were made prior to beginning this study. The current accountability movement emphasizes the use of data. Districts are awash with data, often with modest resources to collect and analyze all their data. Current and aspiring principals must be able to grasp and use the concepts and tools of data analysis and evaluation, i.e., driven decision-making. Universities have an obligation to engage with local schools to assist with improvement. Thus, to incorporate the best of professional development, authentic learning theory, and problem-based learning, a collaborative graduate course, in partnership with local schools, would be required of aspiring principals. The course would replace a traditional course in the introduction of educational research. The graduate students would analyze real student data needed for support of program decisions in schools.

The research question was: How can a principal certification course engage students in authentic learning, learn the often complex nature of data driven decision-making, work collaboratively with district personnel, and produce projects needed by schools? This study reports the results of the design, implementation, and evaluation of such a university course in partnership with local schools that models the theory of authentic learning.

Method

Setting

The context of the study was a fifteen-week, three credit graduate course in data driven decision-making offered by a comprehensive state university. The university of 6,000 students with 1,500 graduate students offers masters degrees in the arts and sciences and professional

studies. The campus is situated in a rapidly growing area within a one to two hour drive from two major urban areas. The course is required of all students pursuing state certification in school administration. The class was scheduled weekly from 4-7 pm. Seven classes were conventionally structured. The remainder contained voluntary sessions to practice with software tools or consult with the professor. Teams could schedule their own meetings, but they were required to email the professor their meeting agenda. Many teams chose to meet at their school site, the university library, or general study areas of the university.

Participants

The study involved a local school district and university graduate students. All but one of the fifteen students were preparing for principal certification. The exception had an administrative certificate, but was taking the course out of professional interest. Nine students worked for the local partner district; one worked for a partner school from another district; the remainder worked for non-partner schools. Five students and the one principal were female. Teaching experience ranged from three to eight years, with one having taught 18 years. Nine were high school teachers, three were middle school teachers, and two were intermediate grade teachers. The subjects taught by these teachers included mathematics, Spanish, language arts, special education, and physical education. Seven students were in the last year of their graduate program.

The partners were five local school principals and a district liaison. The partner school district served more than 7,500 students of which 35% were minority students. Of the more than 480 teachers, 40% held a Master's degree. There were six elementary schools, two intermediate schools, and two high schools. The

Superintendent authorized and supported the partnership, and the Assistant Superintendent for Curriculum and Instruction was the district liaison. The Assistant Superintendent for Personnel and the Director of Technology were consulted at various times on issues of confidentiality and access to student data. All but one K-8 school had a history of hosting our institution's student teachers, so a working relationship already existed between the university and the participating district.

The professor for the course had nine years experience in high school teaching, public school administration, and state and local technical assistance. Eighteen years in college and university teaching included educational psychology and research methods at the pre-service, masters, and doctoral levels. Field research and experiential learning were incorporated into several graduate research courses.

Data Source

Activities and assignments, aligned to course objectives, were used to measure graduate student effectiveness and explore attitudes. The professor made reflective notes after each class and following any team meetings attended. A written team research project report and an oral presentation were the major assignments. Students maintained a work log and journal of their activities outside of class. Students completed two open-ended evaluation instruments. The professor conducted telephone interviews with the principals after the completion of the course. For each work related task, the student logged a record of the date, number of hours, team members involved, activity, and follow-up work necessary. For each log entry, reflective writing was required in response to six prompts. See Appendix 1 for a list of the reflective prompts.

The team project report was graded using a rubric that included the following criteria: organization, content, and writing. The report contained five sections. An empirically based need statement justified the importance of the topic to the school. The problem statement described the goal of the research. The research question, derived from the problem statement, identified the variables, their relationship, and the participants. The analysis described the data source, the tools to analyze the data, and the results. The conclusion interpreted the results and recommended decisions for the school. Appropriate tables and/or graphs supported the text. The writing was to target an audience of principals, superintendents, and school board members (i.e., the style was to be direct, only moderately technical, with succinct conclusions).

Two different course evaluation instruments were administered during the last class meeting. Each student completed the first after discussion with team members. A second instrument was completed individually without team consultation and submitted anonymously. The professor used the same questions from the first student set to phone-interview the principals. Follow-up questions and unsolicited comments from the principals were also recorded. See Appendix 2 for student evaluation questions and principal interview questions.

Procedure

In the semester prior to the course, the professor met with district officials to discuss the goal of the course, namely that graduate students under the professor's direction would help local schools with data analysis and program evaluation. The Assistant Superintendent identified four school principals who had evaluation questions and were willing to participate. A fifth principal agreed to participate after a class member asked to do a project at his school.

At the first class meeting, the students' prior knowledge was assessed with a group brainstorming activity. Discussion of students' knowledge and experience led to selection of the evaluation topics. Then the professor divided the work into three phases. The first phase defined the evaluation question and determined the accessibility of data. The next included accessing, organizing and analyzing the data. The last phase involved developing tables and graphs, interpreting the results, and writing the report. The course syllabus, power point slides of notes, assignments, guidelines, and some basic concepts in statistics were available through WebCT ® (WebCT, 2004) for the course. The asynchronous bulletin board feature of the site was used for team progress reports and announcements.

Students formed teams of three to five, based upon common interest in the project options. The division of labor included a school liaison, a writer, a computer/data analyst, and a group facilitator/moderator. The team drafted questions to ask the school principal. The professor met with each team to review its questions and give further direction before meeting with the school principals. As soon as possible, meetings were scheduled with the principals.

Traditional lecture, demonstration, and discussion occurred during the next three class meetings. The topics of measurement, evaluation design, data analysis, and statistics were addressed. Most students knew the spreadsheet Excel® (Microsoft, 2003), but some extended learning occurred to enable downloading of internet-based data. All students learned the basics of the statistical software SPSS® (SPSS, 2005) version 12. Class time enabled teams to extend and refine the evaluation

topics. Teams occasionally discovered difficulties with the definition of school needs, with data access, or with procedures within the statistical package. To deal with such problems as they arose, the professor regularly convened the class during scheduled meetings for whole class problem solving. Follow-up meetings with the principals provided feedback to ensure the practical worth of the project goals. Once agreed upon by the principal and the professor, teams posted their proposal on WebCt®.

All work with data was hands-on, because class meetings were in a computer lab. Each student had a desktop computer, equipped with Excel®, SPSS®, a web browser, and networked to a high-speed laser printer. The professor used a workstation enabling computer projection to the class. Initial demonstrations used sample data downloaded from an online database, Performance Tracker® (alterNet Performance, 2004) used by the district. After the demonstrations, all analysis was done with the real school data needed for the project.

Two more class meetings were scheduled. In the 8th week a management update meeting was scheduled. Teams presented their progress to the professor and the class, including interim products and any major difficulties. During the last week of the fifteen-week semester, a symposium was convened. Each team submitted a final report to the professor and provided an executive summary to class members and guests. Guests included two participating principals, the district liaison, two professors from the department, and the department chairperson. A ten-minute presentation was made using PowerPoint slides (Microsoft, 2003). An extended discussion of the course goals, assignments, and outcomes ensued upon completion of the presentations. All graduate student products were assessed with rubrics which were available online at the beginning of the course.

After completion of the course, telephone interviews were conducted with all principals. The written summary responses were read. Then patterns, trends, and inconsistencies between the students' and principals' responses were documented.

Results

Student Learning: Self-Reported

The total number of work sessions reported by the fifteen students was 168 with a mean number of 11.2 sessions per student (SD=4.9). The number of sessions ranged from seven to 27. The total hours reported was 317.8, with a mean of 21.2 per student (SD=11.2). The number of engaged hours per student ranged from 10 to 44.6.

The patterns of journal entries on personal learning in response to the first six questions of the prompts showed consistency. The students wrote about the need to narrow the evaluation problem, the perceived time to complete the project, and access to necessary data. They described the initial negotiation among team members and between the team and principal on the specific nature of the study. In several schools it took more than one meeting with the principal to clarify the need and define a feasible evaluation question. Often principals shared global concerns that were "hard to pin down." For example, one principal believed that heterogeneous ability grouping for remedial reading was not effective and wanted to demonstrate that homogeneous ability grouping was better. In this instance, the team and the principal agreed to start by investigating if there was a difference between reading achievement of boys and girls in the heterogeneous groups.

The students also wrote about a sense of pressure to complete the project. Unlike previous, more traditional classes,

they had responsibility to plan the study, collaborate with peers, and negotiate with school administrators. The students were given directions, but they developed the details on their own. The professor coached teams on time management, technical questions of study design, analysis and writing.

After their initial anxiety eased, students reported that the major obstacles were the scheduling of group work and retrieving necessary data. Although willing to provide data, principals were occasionally frustrated by what seemed to be slow turnaround from the central office. An additional delay occurred when issues of confidentiality arose. The partner district decided to require a signed memorandum of understanding with the university concerning the confidential nature of student data. Also, a signed, notarized affidavit was required from students in the course to document their understanding of confidentiality and the limits of use of the student data. These events turned out to be a valuable lesson in school law, but it resulted in a two-week delay in receiving data.

Five themes emerged from the student responses to the final journaling prompt: *What have you learned and how will you apply it to your own instructional leadership?*

1. Framing the problem into a concise problem statement is essential for success.

"If the problem is too broad, a clear solution can not even begin to be researched."

"…committees in the school are important to help decide what some of those questions are and how to go about searching for the data."

2. Collaboration, although difficult to manage, draws upon multiple strengths.

"Data driven research is a timely ordeal that involves a large group of people, e.g., our project needed the assistance of the principal, the central office and other staff members to help with the gathering of the appropriate data."

3. Making decisions with data often uncovers bias and the unexpected.

"The principal felt that there was a strong correlation between [student] transience and PSSA achievement, but we actually found other relationships that were stronger."

"I learned that it is ok to delve into the unknown. The beginning is foggy and the end is exciting. I was able to step outside of my comfort zone … to learn something different."

"It may seem that the data is fairly straight forward [but] when you actually break it down and look at it analytically it takes on a whole new shape."

4. The sheer volume and complexity of data makes collecting and using it a challenge.

"It's no surprise when not many decisions are made from [so much] data."

"I understand how complex, in-depth, and sometimes mystifying evaluation can be for a teacher or an administrator."

"The key is being able to obtain this information and having the time to manipulate enough for it to be useful."

5. The project had obvious application to classrooms and administration.

"I will be able to look at students' progress in my own class and better determine an instructional course of action."

"As a principal, I want to avoid gut decisions when the stakes are high and model, from day one, for my teachers how to use data to inform decisions.

"[The project] gave me a realistic look at how administrators make informed decisions."

Student Learning: Written Project Quality

The five team projects focused generally on the effectiveness of programs designed to improve at-risk student achievement. All achievement measures were state or district standardized tests. The five project research questions were:

1. Is a mathematics remediation program for sixth and seventh graders equally effective for boys and girls?

2. Is student transience in the school and gender of students related to reading achievement in third and fourth grades?

3. Is student transience in the school, attendance, gender, and socioeconomic status related to state test scores in math and reading at fourth grade?

4. Is the use of a computer-based, language arts program related to increased comprehension, accuracy, and words-per-minute in third, fourth, and fifth graders?

5. Do recently implemented remedial reading programs improve reading achievement over one year among non-proficient fourth graders?

Two of the five reports were excellent. Two others were very well done. All four were thorough and professionally presented, with conclusions substantiated by the results. The remaining report was competent, but not outstanding, because the producing team received incomplete data. The team completed the report with the data available, which resulted in some incomplete conclusions.

Evaluation of the School — University Partnership

These results are derived from student and principal responses to the evaluation surveys and are organized by the issues addressed in each survey question.

1. What were the initial observations, expectations, and concerns?

Students: The new course raised the anxiety level of students. They had no prior information from former students. They were concerned about the lack of structure—several students viewed the course as an "independent study, like grant writing and action research work." They were also "unsure of how data would be obtained and evaluated." However, they admitted that the project would be more relevant than the research paper in the former research course, because it "…offers practical application of real-life problems."

Principals: Two said they had "no concerns whatsoever, it was a wonderful opportunity." Several did have doubts about the amount of time the project would take. They were skeptical about their required commitment of time and whether the study would reach any conclusions in the fifteen weeks of a semester. Others were not sure if the questions they wanted addressed could be answered by the data available.

2. What were the course obstacles and how they were overcome from first evaluation?

Students: Almost unanimously, the students found the lack of data and the difficulty in getting the data to be the primary obstacle. Several reported time as the greatest obstacle, e.g., "entering data," "finding common time for all parties [in the team] to meet," and the "scheduling of after school meetings".

Principals: For the principals, "the timing of students' requests" and "the logistical difficulty in scheduling student meetings" posed some obstacles. Most were successfully facilitated with email and telephone communication. But one principal noted that having a teacher from his school serve as a liaison was almost essential, i.e., " knowing [about] the school, the data, and scheduling time with me would have been difficult without my staff member being the liaison team member."

3. Upon what is such a partnership dependent?

Students: The students identified the history of a working relationship already in place. Student teaching placement and contacts between university faculty and school administrators were common. Also, proximity of the campus to the district made scheduling meetings with the principal easier.

Principals: Central office support and resources are essential. A partnership is also dependent upon an understanding that the partnership cannot "burden us" or that "schools are somehow taken advantage of." "Guidelines for them [principals] to follow and involving them [principals] earlier" would increase participation.

4. What are some advantages/disadvantages of work between the district and university?

Principals: The responses unanimously emphasized the realistic learning experiences for students and the inexpensive help for the district. The students learned about working together, getting involved, listening, and taking suggestions. "The collaboration and the opportunity of discussing needs from different viewpoints was [sic] valuable" and "it offered us the time and personnel to do something we would not have done [the project]." "Students did some real solid work sorting out the questions from the principal, knowing what kind of data was [sic] needed, and analyzing it."

The disadvantages included available time and the follow-through of recommendations. Principals said they needed more time to think about and prepare questions. They also worried about "sustaining the effort" once the student team is finished and the help is gone. One speculated generally about "accommodating to change in the university participation" if the goals of the course or the graduate program were revised.

Students were not asked to respond to this question.

5. What advice would you give about participating in a similar course?

Students: All students highly recommended the course to potential school administrators. They suggested "getting their team in place quickly and [exerting] pressure on the district to get data in [a] timely manner." They recommended "spending time up front defining the problem" and "being prepared for major difficulties and setbacks." They advised future students to be "patient and don't expect clear cut procedures."

Principals: The principals suggested to students that the course should be taken later in the graduate curriculum, because "some of the students were new to educational administration and had not had a basic administration course or a school law course." They too warned of being "prepared for roadblocks, [so] do not get frustrated", but this is an occupational hazard of being a principal. To their colleagues, they recommended starting the brainstorming process before the course and "develop a wish list" for one's building. The project must be "worthwhile for the school." It is not as important for direct relevancy for student, because they are learning more of "how to work with data in general than how to solve specific problems."

6. What criticisms, suggestions, questions or comments do you have?

Students: The students had little criticism, but did suggest that student teams must meet quickly at the beginning and plan seriously to ensure adequate time for data analysis. Several said, "the group work was helpful, but…," "start quickly," "be sure the

data are ready," "spend time up front defining the problem."

Principals: The principals reported wanting more of this kind of consultation, but could not pay for it. Rather, they suggested "that sustained work could be done through the Professional Development School or be part of a leadership academy." They wanted to know how to have a "shared evaluation department", i.e., some kind of consortium among schools and the university to work on evaluation problems. The principals unanimously affirmed the importance of data analysis and evaluation, expressing interest "in sharing and discussing data as professional development."

Three principals said that students needed more prerequisite knowledge beyond an introductory administration course, such as familiarity with district tests and specific reading programs in use. One principal recommended that the course goals should be applied to a beginning cohort of students in the graduate program. First "a research problem is introduced in an introductory class, then it is planned and analyzed in this [data driven] course, and finally it is implemented during the [required] internship."

Evaluation of the Course

1. What were the advantages of this course?
The trends that emerged from the class's short sentences and phrases are summarized below.
   a. Independence, self-direction, self-selection of ones group;
   b. Flexible class times;
   c. Hands-on, practical experiences and tasks, directly relevant to professional aspirations;
   d. Collaboration, opportunity to learn from peers;

   e. Interaction with administrators, treated as professionals; and
   f. Professor's availability and support.

2. What were weaknesses of this course?
Three response patterns were evident, but by far the largest was the difficulty in getting the data once the evaluation question was identified. Four students wanted to learn about other procedures available with SPSS. Three students felt "the unknown" of the course or "lack of clear understanding of the goals" or "uncertainty of what had to be done" was a weakness. They wanted more structure, more specific exercise, and deadlines.

3. What were your significant achievements?
   a. The ability to collect, analyze, and interpret student data;
   b. The use of data analysis software—SPSS and Excel; and
   c. The skills to complete a group project.

4. What more must you learn?
   a. Other uses for SPSS such as its graphing tools and other statistics;
   b. One student cited "assertiveness" and another wanted to know "how to present this in a meaningful way to faculty."

5. How has this helped you in your preparation for school leadership?
All recognized the importance, the growing need, and the challenges for school leaders to be able to use data to make informed decisions about student achievement.
   a. We must use "data driven research to help decide what works."
   b. "Lots of talk about these skills in districts, but now I know what to do with data."
   c. "I have some useful tools that I can use to be a successful administrator."

d. I have experienced one aspect of "critical thinking about what works for administrators."

e. One student was interested in having "future classes follow up old data research to see if results are consistent."

Conclusions

This case study described the authentic, problem-based learning approach within a school-university partnership to teach data driven decision-making to aspiring principals. As this article was being completed, Boudett, Murnane, City, and Moody (2005) reported on a workshop at the Harvard Graduate School of Education. Their one graduate credit workshop collaborated with local schools, but focused more on teaching a broad school improvement process, rather than on data driven, decision-making.

The result of this case study was a course that:

- Met state certification standards,
- Challenged students to experience the complex work of decision-making,
- Partnered practicing principals with teams of aspiring principals, and
- Executed a collaborative evaluation project needed by schools.

Student surveys, student journals, class assignments, and interviews with participating principals indicated that the course outcomes were successfully achieved. The graduate students learned the difficulty of defining a feasible evaluation question and accessing appropriate data in a timely manner. They mastered the basics of two popular data analysis tools and reported the need to understand more advanced analysis. They were convinced that more effective decisions could be made when clearly defined questions were answered based upon appropriate data. In accomplishing these course outcomes, the students learned in an authentic manner how to work collaboratively, sort out issues, and delegate responsibility.

Quality of Student Work

The students reported positive attitudes toward the goals and activities. They were confident with the work they produced. The professor judged the students' projects to be of high quality for graduate work. The principals were pleased with the help they received from the student teams. In fact, they were hopeful that the data collection and analysis could be the subject of sustained study. The principals agreed that students' collaborative work was important for their school. As such, they validated the authentic learning experiences for the principal certification program.

Partnership and Collaboration

The students worked collaboratively with peers and local principals. They reported clear application of their projects to classrooms and school administration. The projects dealt with timely issues of the effectiveness of remedial programs. Furthermore, the projects were context-specific, i.e., the kinds of challenges faced by principals with students at-risk. The students observed other problem solving strategies used by their peers during discussion.

Ambiguity and Complexity of Real Problems

The course was student-centered and problem-based. Students uncovered biases and unexpected findings as they analyzed student data. Simple solutions were often elusive, because of the volume and complexity of the data. Solving one part of the problem often created more problems. Students frequently cited the ambiguity of tasks, time pressure, and anxiety in

completing the assignment. They wrestled with 'messy' and unexpected problems when producing an evaluation report. Without formal course specifications, students were forced to act more independently.

Planning and Choice

Better planning with districts will help identify research questions and the appropriate types of data analysis. In some cases, the data were not available as readily as expected. Identifying appropriate data in advance would ensure availability. Some research questions would have to be made without student input or negotiation. Such a scenario would limit freedom of choice of topics for students and principals. Lack of choice reduces motivation, limits negotiation, and in the long run could compromise the nature of the partnership innovation.

Relevance and Usefulness

In order to ensure maximum learning, the projects should be useful to schools and still suit individual student needs. Several students, whose school was not under study, lacked clear ownership of the research questions. Personal interest and commitment in a community of learners are essential to authentic learning. Thus, the logistics of the course should ensure that the teams consist only of a cohort from the participating school district. When students must work alone on a project using data from their home school, the important criterion of collaboration is sacrificed. This innovative course could be delivered on a school site, but a district needs to identify a cohort of enough aspiring principals to justify the course offering.

Limitations

This approach to graduate education is certainly not appropriate for all educational leadership programs. Although the underlying theory and principles of authentic learning and problem-based study would be difficult to argue against, the assumptions and format of such a course may pose hurdles.

A local school district interested in participating is necessary. We had a working relationship through field experience placements, a few principal interns, and two principals in our doctoral program. A critical mass of graduate students from that school district is required. In more remote geographic areas, access to schools and enough students to meet class enrollment could be problematic. [Note the last point in the Guidelines below however.] An alternative would be to permit students to use their own school's research problem for the project. However, without a team to work on the project, 'group think' is compromised. Furthermore, with potentially as many data sources as students, the instructor's capacity to manage the projects would be limited in terms of feedback to students.

The scheduling of such a course seems to limit it to the standard school year. Summer courses preclude the access of students to participating principals who would not be under contract for part of the summer. Many graduate students in education use the summer to acquire one or more courses, so a program might have to rely on an early summer session. This latter point might be difficult for principals at the very busy end of the year.

The sheer non-traditional nature of course meetings might prohibit such a course. The university policy and/or collective bargaining agreement might restrict the non-traditional use of course meeting hours outside of class. Advanced negotiation might be necessary, although with the growth of distance learning, the logic of such a course seems reasonable.

Guidelines for Adoption of a University Course

Authentic learning can be executed in the context of a university course. One successful approach is to use school/university partnerships to analyze student data. For those considering development of, or participation in, a similar course, specific guidelines are offered.

- Plan data requirements and procedures with the school's central office at least six months in advance. Discuss and clarify the research questions, types of data that may be needed, and legal restrictions.
- After central office approval, contact principals, allowing 3-4 months of advance notice, to identify needed data driven decisions. Begin the process in the summer when principals have more time and recent student data are available.
- Limit the course to 15-18 students with 5-6 teams of three.
- Offer supplemental tutoring in measurement, statistics, and use of analysis software, in person or through on-line self-instruction. Teachers who are on a principal track seem to lack the knowledge and familiarity with the software tools, despite widespread use of computers in schools.
- Consider a two-semester course. Include in the first semester the needs assessment and problem definition. Include in the second semester data collection, analysis, and evaluation.
- Provide clear course expectations about the amount of time required. Students needed approximately eleven work sessions outside of class, averaging 22 hours, not including reading assignments. Use the first three to four classes for course concepts and computer practice. Allocate at least one class for mid-course update. Plan the last class for formal presentations and discussion.
- Monitor personality conflicts and unequal workloads early. The five teams of three members each enabled the professor to handle issues effectively.
- Consider delivering the course on site to a specific district, tailored to their needs. The benefit to the district would be twofold. People who have direct ownership of the problem address one or more research problems. And the course would attract those not needing the educational administration master's degree. Many might want to participate to maintain their certification through required professional development credit.

A graduate course for aspiring principals can successfully facilitate authentic learning through problem-based decision making. A culture of authentic learning was modeled within a school-university partnership. Real school issues were confronted, and participants learned from each other and valued each person's contribution. Ambiguity was expected, responsibility was delegated, and a community of learners was established. Furthermore, the course structure and the students' work dispel the criticism that educational leadership programs necessarily lack a blend of the theoretical and practical, neglecting active learning pedagogies (cf. Levine, 2005).

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About the Author

Philip A. Griswold is an Associate Professor, holding the Ed.D. in educational psychology from Rutgers, The State University of New Jersey. His current interests include the application of problem-based learning to professional educator preparation. The syllabus, rubrics and project guidelines are available by emailing the author at pgriswold@po-box.esu.edu

Appendix. Data Collection Questions and Prompts

I. Reflective Prompts for Journal
1. Describe your concerns as you begin an activity.
2. What prior knowledge aided you in this activity?
3. What did you learn in the course that was most meaningful to the task?
4. What did you learn in the course that was meaningful, but indirect to the task?
5. What do you need to learn prior to any follow-up or next step?
6. [Upon completion of the last project activity] What have you learned about educational evaluation and data driven decision-making that you will apply to your own instructional leadership?

II. Student Team Questions (Discussed among team members, but answered individually)
1. What were your initial observations, expectations and concerns?
2. Why do you believe the school district and university decided to work together?
3. What has made the partnership possible?
4. What have been the obstacles? How were they overcome?
5. What advice can you give others who may wish to participate in a similar program?

III. Student Individual Questions (Answered privately and submitted anonymously)
1. What were the advantages of this course?
2. What were the weaknesses?
3. What were your significant achievements?
4. What more must you learn?
5. What should be done to improve the course?
6. How has this helped you in your preparation for school leadership?

IV. Principals' Interview Questions
1. What were your initial observations, expectations, and concerns about this partnership?
2. What were the obstacles? How were they overcome?
3. What are some advantages and disadvantages of work between the school district and the university?
4. What are some issues that such a partnership is dependent upon?
5. What advice would you give others who may wish to participate in a similar program?
6. What criticisms, suggestions, questions or comments do you wish to share?