Chapter 10
The View from the Top of the Plateau

Fred N. Finley, Brad Johnson, and Hallie Kamesch

Introduction

When we began this inquiry, we had assumed that the School of Environmental Studies, the object of the study, was a very successful and innovative school. Nothing that we learned challenges that assumption. The consistent stories provided by all who we interviewed indicate that the school has been incredibly successful. The intent of our inquiry was to learn what circumstances and factors led to the school climbing to the top of the plateau and what the view from the top looked like to the teachers. We expected to see that, over the years, the school might have largely given up its initial vision due to complacency, changing external conditions (e.g., state testing and standards or declining budget resources) and changes in staff, etc. Another possibility was that the school had stagnated, such that it was no longer engaging students as it once had. We also expected that the school at the top of the plateau might be isolated on the plateau and not looking toward climbing to the next plateau. We made these less-than-optimistic assumptions because sustaining successful innovations is known to be incredibly difficult.

F.N. Finley (✉) • H. Kamesch
STEM Education Center, University of Minnesota, 320-H Learning and Environmental Sciences, 1954 Buford Ave., St. Paul, MN 55108, USA
e-mail: finle001@umn.edu; hallie.kamesch@gmail.com

B. Johnson
School of Environmental Studies, 12155 Johnny Cake Road, Apple Valley, MN 55124, USA
e-mail: bvillejohns@mac.com

M.P. Mueller et al. (eds.), *Assessing Schools for Generation R (Responsibility)*, Contemporary Trends and Issues in Science Education 41,
DOI 10.1007/978-94-007-2748-9_10,

The School and Setting

The School of Environmental Studies opened in 1994; it serves around 400 juniors and seniors and has approximately 24 teachers. The diversity of students in the district and School of Environmental Studies features are, respectively, 14 and 8 % in Special Education; 14 and 7 % on free and reduced lunch; 8 and 5 %, Asian; 9 and 3 %, Black; and 6 and 2 %, Hispanic. The school is located on 12 acres of land, on which is a small wooded area surrounding a pond. It is adjacent to the Minnesota Zoo and across the street from a well-wooded regional park.

The school is organized into houses—two junior houses and two senior houses—each with approximately 100 students. The students in each house meet for three hours each day and are taught by a team of three teachers—one each from science, social studies, and English. Other junior- and senior-level courses and electives (mathematics, physics, chemistry, art, careers, and languages) are taught during the rest of the day. The larger extracurricular programs, such as sports and music, are taught at the other high schools; the students return to those schools for those activities.

The details of the innovations that have shaped the school will become evident in what the teachers told us. However, the innovations can be summarized by saying that students were to become self-directed learners, engaged in their community, and environmentally responsible citizens of the world. They were to do so by learning about natural and social environments in an integrated way and by learning the knowledge and skills that are necessary to live in the real world, whether that be that the world of continuing studies or of work.

Approach

Our approach to the study was to view the school as a case that might reveal how a successful innovation comes about, what occurs as the innovation continues through time, what factors contribute to its being sustained, and what factors challenge the innovation. The inquiry was not a full-scale case study, in that we did not interview all stakeholders, or engage in extensive observations of meetings and classrooms, or exhaustively search documents associated with the school. Rather, we investigated selected teachers' views of their school in-depth, in order to reveal the practitioners' views from the plateau. We met with those whom we thought would know the school best. The teachers were selected to represent those who founded the school, those who joined the school within two years after the school was founded, and those who joined the school after it had been in operation for several years. No one who we interviewed had been there fewer than seven years. Truly, new teachers are not part of the school because of layoffs due to budget cuts. The teachers who we selected represented different subject matters (science, social science, and English) and were from the different houses. Those who teach other courses in the school, such as mathematics, languages, physics, or art, were not included, because they are not as directly involved in the innovative portions

of the program. To complete the picture, we also examined the original founding documents and current program descriptions.

We interviewed six teachers and the school principal for approximately 1 hour each. The interview was designed to seek the teachers' perceptions of the context, overall goals, curriculum (what was to be taught), instruction (how the teaching was to be done), and assessments of the students and of the school overall. The teachers were questioned in these areas with respect to the past, present, and future. The depth and breadth of their responses to the questions was remarkable; the responses were very passionate, coherent, insightful, and reflective. If one had in some way "mapped" each person's responses, each point on the map would have been intricately related to many other points. We wish that all who read this chapter could listen to these interviews and hear for themselves the breadth and depth of the participants' understanding of their practices, why they do what they do, and why they do not or cannot do more. Perhaps we can give some voice to these consummate professionals and learn from their knowledge and wisdom. Here is the story we were told. It is presented as a compilation of their perceptions and perspectives with regard to the context of the school's development, goals, curriculum, instruction, and assessment.

The Context of Development

The context of development—the circumstances at the time the school was formed—matters even today. The initial key players were the superintendent and the curriculum director from the district, the director of the zoo, an educator on the zoo staff, two or three teachers in the district, and the mayor of Apple Valley, Minnesota, all of whom were innovators seeking opportunities for collaboration. The district wanted connections with the community and space for expected increasing numbers of students. The school district recognized that the cost of a large comprehensive school was much greater than the cost associated with creating one or more small schools. The zoo wanted buildings and an outlet for its educational programs. The politics of the community at the time favored innovation. The mayor and city council were willing to float 20-year bonds to build a smaller school as part of its response to community concerns about the building of a new comprehensive high school; they also were ready to act out of a sense that promoting educational innovation was part of their responsibility. Five options were considered for small high schools. These options were related to business, the humanities, health sciences, human services, and the environment. The original plan was to build more than one school. Each option required a real and substantial community partner.

The most real and substantive partner was the zoo, with which the district had an ongoing programmatic relationship. The SES probably would not have been built if it had not been so well supported by so many players or if it had not been first on the list. Ultimately, the district built only one small school. A new superintendent opposed the building of smaller schools, favoring instead the development of a

comprehensive high school, which was in fact eventually constructed. What saved the SES was the fact that its development was already well on the way when the new superintendent arrived: it was just too late to stop.

Clearly, economics, demographics, available and engaged personnel, and community opinions were all major factors in the development of the School of Environmental Studies. However, the school probably would not have been built if these factors had not been accompanied by commitment both to innovation and to a complex of ideas that people thought would be good for children. Originally, the school was based on the ideas that were derived from then-emerging research concerning effective school size and essential schools. The commitment to basing the school on current research and expertise from the University of Minnesota was substantive.

The importance of the research base is most evident in the teachers' and the principal's discussions during the planning process. That process involved an extensive examination of relevant research literature, consultations with educational researchers and architects, visits to innovative schools, and self-study. The process also involved many hours of what Schwab would have called practical deliberations: the eclectic use of good ideas from many sources about many facets of a complex undertaking that are formed into a coherent and integrated plan. The plan consisted of many details, but some areas were of necessity left open. What was critical was the emergence of a set of what we call a *goal network of mid-level principles*: principles that could be used to guide specific decisions and plans for both the short term and the long term.

A reasonable interpretation of the interviews is that the school was designed and built because of a complex of practical contextual matters operating in conjunction with good, research-based ideas and knowledge of best practices. Another reasonable interpretation would be that the school would not have been built and would not have been successful or sustained without the synergies resulting from the interactions of the above factors, which resulted in the goals network of mid-level principles.

When the teachers and the principal were asked about today's context and the future, most of the comments were about changes in the current context. The most common concern was that there is no time to talk to each other within houses, across houses at the same grade level, or across the two grade levels. The teachers expressed a genuine yearning to be able to have facilitated conversations to review their goals, coordinate and update the curriculum, and redesign some of their instruction, especially in the area of using technology to teach. Some remembered the experience of having real and substantial time to study and plan on behalf of the school. Others who were not involved in the initial planning had heard of the value of the experience and recognized its value by coming into a situation that was thoughtfully designed. There was a sense that they were losing track of the goals and that the direction of the school was drifting onto an unplanned course. There were also questions about whether or not the nature of the students had changed and if the school had been responsive enough to such changes. A part of this concern was a sense that the students who were enrolling in the school had many more unmet needs of increasing severity.

For our part, and as best we could see, the school program continues to be driven by the original goals. The curriculum also remains reasonably well coordinated, but the coordination could be refined. We also recognized the teachers' sense that their knowledge and use of the goals, the coordination and currency of the curriculum, their instructional methods, and their own understanding of recent research and best practices are slipping.

It would be wise to heed teachers' concerns, we suspect, by creating substantial opportunities for them to examine their goals, the curriculum, and the instruction, especially since, as we will show, the time allocated during the development of the school has served the institution, students, and community so long and so well.

A second area of concern relates to staffing. Some of the original founding members have retired and others are nearing retirement. With the retirements comes the loss of intuitional memory and wisdom. Current hiring and within-district transfer practices are seen as working against finding new teachers who truly want to work in this unique school and who have the knowledge, skill, temperament, and commitment required to sustain the vision. More specifically, the concerns were that new teachers would not be willing to "stand in the rain at the pond," collaborate within and across teams, deal with the fact that every day is "choreographed a little differently," provide guidance and coaching in lieu of direct instruction, create and maintain community connections, or plan and conduct intensive intersession courses.

A third concern is that schools must now advertise and compete for students, not only against other public schools but against private schools. This is expensive and time consuming, but essential when the decreasing numbers of school-age students is coupled with declining state and local per-student aid. If enrollments drop, funds decrease, class sizes increase, and fewer teachers are available to carry out the innovative features of the school. The impact on smaller schools, such as the School of Environmental Studies, is proportionately greater than it is on larger schools.

Goals

We had thought that there might be one overriding goal, as is sometimes the case for schools. However, the School of Environmental Sciences has a set of highly interrelated goals. Taken together, we came to describe this aspect of the school as a goals network. One essential goal in the network was to create a school that provided an alternative learning environment for all students, including those whose needs could be better met outside of the standard "listen to the teacher, do what you are told, take the test" version of the secondary school. Two teachers described the goal as creating a rigorous "middle school for big kids." The idea was to create an environment in which the students felt welcome and encouraged. A second essential goal from the network is that the school would be interdisciplinary, to the point where the students do not see the teachers in their house in terms of their subject-matter specialties. As one teacher said, "The students should and I think do see us just as one of their teachers. They come to any of us regardless of what their work

is requiring." The theme that guided the students' and teachers' interdisciplinary work was environmental. This theme is that students should come to understand the development of the social and natural environments in which they live and in which they will live. A related goal is that the students would be engaged in their local community and even in the communities of the world. Another essential goal is that students are to become independent, self-directed learners who are capable of finding and using resources to do real-world tasks. A corollary to this is the goal of having the teachers be "guides on the sides" rather than "sages on the stage" or in another word, "coaches." A final critical goal was that the assessments would be real world, in that they would be professional and work-related tasks and in that the assessments would be presented in community-based contexts.

Perhaps, if we attempted to write one overall goal, it would be to have the students, teachers, and community work together to become self-directed, successful, and environmentally responsible citizens. However, as can be seen above, this statement seems too vacuous, or at least overly general. The contrast between reading about the network of goals and this overly general statement is substantial. In fact, we would claim that one of the findings of this inquiry is that one of the reasons for the school's success is that the originators avoided vacuous feel-good goals in favor of a network of mid-level goals that could be translated into practices. The strongest evidence for this claim is that when asked about the current goals, the teachers and principal were universal in saying the original goals were still successfully in play. Founding teachers and newer teachers all said the same. Further, when asked about future goals, the statements were all about better ways to use the original goals and ways to protect against "drift" or "slippage."

As for future goals, teachers expressed the concern that the goals were becoming "less clear" and that they needed to be revisited. That said, there was strong support for the existing goals and no clear statements of new goals that should be considered.

Curriculum

The interviews did not reveal as much about the subject-matter specifics of the school curriculum as we had expected. This was interesting, because teachers elsewhere usually focus on discussing the discipline-specific knowledge and skills they teach. The School of Environmental Studies teachers thought about their curriculum differently and in terms of the goal network. This is not to say that the teachers thought their subject matters were unimportant, quite the opposite, in fact. Each teacher expressed his/her belief that his/her subject was essential to the larger goals.

One expression of the use of broader educational goals can be seen in an English teacher's view of her curriculum. She indicated that in the first trimester of the Grade 11 house, students learned about the relationships between living organisms and water—first ponds, then rivers, then oceans. She said students were asked "What is your role in society and what is your relationship to the earth?" She went

on to say that the students were learning how people have looked at the world in the past and how things ought to be. She said that from the science side, the idea was to have students learn an evolutionary perspective of how life came to be. From English and social studies, the students were to learn how certain societies have been affected by imperialism. Imperialism was studied by learning about pre- and post-colonial Congo, India, and South America, through reading literature such as the *Heart of Darkness*. She also indicated that students studied philosophy through books like *Sophie's World*, and by reading the works of environmental philosophers such as John Muir, Teddy Roosevelt and Gary Snyder, to learn how humans have come to think about ourselves as we do. She saw this work as related to the primary project of the year, which was having the students create their environmental philosophy. She also pointed out that this junior-level curriculum about how we got to be like we are leads into the senior year, when students are asked "What is your role as a citizen in the world?"

A second expression of the teachers' use of the goals network to determine their curriculum is that they wanted time and opportunity to revisit the ways in which their subject matters contributed to the larger goals and worked together. For example, the topic of imperialism has been used for a long time, and the instructional materials and books for this topic have not been revised recently. However, the teachers are considering, as best their limited time allows, changing this topic to globalization as an alternative. They are thinking that the world has changed due to new communications technologies, more open access to other countries, and global transnational corporations, and they believe that Globalization would better serve the goals network. Making a change from using imperialism to globalization, when all other aspects of the curriculum are interrelated with the study of imperialism, would be a daunting task. Many of the instructional resources would need to be changed; new purchases of books, videos, and some equipment and materials would be required; new field experiences would have to planned; most of the instructional materials would have to be rewritten; and most of the assessments would have to be modified. About the only thing that would not have to be changed is the goals network. In fact, this change is being seriously considered and slowly tested because the idea of globalization is likely to serve students better.

The teachers thought about curriculum differently from what we expected in one other way. At least some teachers used cross-disciplinary principles when discussing what they teach. For example, one social studies teacher said he teaches "Complexity […] there are no easy problems, there are only problems that might look like they are easy – there are definitely no easy solutions […] whenever you think you have one, there are unintended consequences. Try to look at everything for all its component parts and that those parts are interrelated and it is not a linear progression." He then cited the example of having students "Reading critically and writing critically [about a complex issue] to challenge what students have been taught since day one." He had students read an article titled "Recycling is Garbage" that makes the case that much of what has been taught about recycling is bogus. "Many [students] go get new information and find the book may be right about economic gain but that [recycling] will done anyway because it makes us feel good

and serves something in our soul. Other students say that all the numbers are wrong and the author is wrong." The teacher then went on to say that what he is teaching is the critical analysis of a complex matter and that it is being accomplished along with meeting the school goals and state standards. A science teacher has also indicated his use of the complexity theme.

The curriculum is very rigorous and sophisticated, as can be seen in what students are asked to read, write, and present. The critical point is that teachers seem to be well aware of, and guided by, the mid-level goals network and perhaps themes when selecting what to teach from their own fields. One contextual factor related to the teachers developing their sophisticated curricula needs to be mentioned. We noticed that the teachers seldom referenced using state standards as the primary source of their curriculum. Instead, teachers used the school goals and said they felt "free from" or "unthreatened by" the standards. This sense of freedom from state standards seems unusual in this day and age. However, the "freedom" is understandable given the context. Most of the state testing has occurred before the students come to the School of Environmental Studies, so the teachers are only minimally concerned about the standards. All that remains for some students is passing the state mathematics, reading, and writing tests, and these are seldom problematic.

At first, one might think that the limited explicit attention given to the standards is "bad." But we think the opposite is the case. The academic work the students are asked to complete encompasses and exceeds the standards. We think that the curriculum is better than what would be developed directly from the standards, in that the curriculum is integrated across the house subjects. Students get to experience the complementarity and synergy of the ideas and skills from various disciplines as they are applied to real-world problems and tasks.

Another function of the freedom from standards is that the teachers can use their own deep knowledge, rich experiences, and community-based opportunities to develop a curriculum that is sophisticated and creative. As one teacher said,

> Not having the state tests is good news because it gives us freedom – we do not have the pressure—we can use other innovative ways of doing the assessments and innovative excursions to relevant topics. Tests are very restrictive. We do not have time to deal with relevant topics. I am cynical about education now. I feel like we are going back to the dark ages in education. Legislatures want a teacher standing in front of room saying what students need to pass test. No creativity is allowed.

Perhaps an unintended consequence of our current penchant for employing inflexible standards comes at the expense of having teachers being able to create rigorous curricula that serve powerful, integrated educational goals as well as the specific disciplines that are taught.

When asked about the future, the teachers expressed several concerns about the curriculum. The primary concern was about staying current with respect to environmental knowledge, skills, and problems at a time when we are learning so much so fast. Another concern was that of figuring out how the non-house subjects, such as chemistry, physics, mathematics, and art, could be more integrated into the house-based curriculum. A part of this concern was that they realized it was already difficult to coordinate and team teach three subjects; they wondered if there is a limit to

how much of this could be done. The final concern was that the demands for advanced placement, like courses in both the house and non-house subjects, were going to intrude on the existing goal set, most particularly, the interdisciplinary nature of the house-based curriculum.

Instruction

The instruction is what might be expected from the goals network. It is student-centered, highly organized, project-based, and varied. The teachers design the activities, make the off-campus arrangements, teach the content and skills, and guide the students through the final project presentations.

Each trimester, the students complete a large primary project as well as smaller tasks. The larger projects are done by groups of 8–10 students. Within the large groups, individuals and small groups are assigned primary responsibilities for specific aspects of their study. Ultimately, all students are responsible for, and must know, all aspects of the study. The most frequently referenced example of a primary project is a pond study the students complete during the first trimester of their junior year. This project requires that students study a pond in the community in terms of the biology and chemistry of the pond and in terms of the interactions between the pond and the local community. The ponds that are studied are selected by the city or a state agency and are actually part of a larger research program in the community. The students learn broad ecological principles, scientific research methods, and about the nature of science in the process of conducting the study. They report the results of their studies to the city or state agency. This project has been ongoing for many years. Over time, the city's ability to actually use the data has diminished somewhat due to the changes in the requirements of the grants funding the studies, changes in city personnel, abilities of the students to reliably use progressively more sophisticated research techniques, changes in the schedules for the studies versus the school schedules, etc. Even so, the city remains committed and involved in this school-based project.

An interesting feature of the project is that it is also used for assessing the students. For example, the assessment of the pond study is stated as "Prepare a historical, (geological), biological, and geographic profile of a local pond for a city government planning agency." The student's inquiries are guided by a primary question and a set of additional key questions:

How do Humans and Other Organisms Adapt to Ponds and Lakes?

- What are the characteristics of wetlands?
- What are the physical and chemical characteristics of water?
- What are the characteristics of lentic freshwater ecosystems, including ponds and lakes?

- What is the psychological and spiritual impact of lentic waters on humans?
- What is the principle flora and fauna of lentic freshwater systems and what are their adaptations?
- What are watersheds and what is the human impact on them?
- What is the geologic and human history of a given water body?

These key questions are then followed by what is called *Components of the Investigation*, which is a set of even more specific questions such as "In what different ways do flora and fauna adapt to life in wetlands?" and "What are the physical and topographical characteristics of wetlands and how are they formed?"

The study is supported by direct instruction and readings from books, articles, and field guides. The direct instruction is typical lecture and discussion. The readings are from books (not textbooks), articles, and technical documents. Students are also directed to use the internet to find the information they need. The internet sites are often the actual locations of state data and maps. A large part of the instruction occurs in the context of modeling a pond study that is carried out under the close guidance of the teachers. During that process, students learn to use field guides to identify organisms; paraphrase and summarize written documents; use microscopes and field equipment; collect, organize, and interpret data; interpret and create maps; interpret technical documents; research local history; and write technical, descriptive documents and reflections.

This somewhat elaborated description is provided to assure that the readers of this chapter can see the depth, breadth, and sophistication of the projects. The project process is rigorous, demanding, and intricate, and the project reports approach professional quality. The project reports are actually submitted to and read by professionals, who have been complimentary. The data have been used in the community. The idea of having students report to their communities is powerful. It raises the students' expectations for quality work and increases the status of "school work."

The roles of the teachers in developing the projects are critical. They are willing to give up some of their sense of control of the learning so that the students' learning is "their own." The teams of teachers also are patient and persistent so that they can see that "we had a break through day. The students are starting to see how tough this is and learn that they can do it on their own." They also have to "[use] instructional practices [that] are more sustained, take longer and involve deeper engagement," "spend more time with the students and instruction (even if it) seems slower," ask lots of questions and make lots of suggestions, facilitate and guide, and be comfortable with "less predetermined outcomes." As one teacher summarized the effects of this approach, "When you see something the students have generated that is new for them, that is beautiful."

In addition to instruction that is based on large and small projects like the one above, the teachers provide what are called intensive theme courses and field experiences. These courses last from a few days to more than 2 weeks. The instruction engages the students deeply in specific experiences and subjects. The intensive theme courses are taught near or at the end of each trimester. The range of topics is

amazing: human medicine, veterinary med, animal care and occupations, Earth Day, wilderness winter camping, sampler courses on careers, art, and fishing and boating. Many of these intensive theme courses involve the associated community and service learning when possible. Field studies have taken students to Denmark to participate in international climate-change discussions, to Costa Rica to study ecotourism impacts on rain forests, to Baffin Island to see impacts of global warming on indigenous peoples, to Alaska to investigate land use management, and to South Florida to study the flow of water from Lake Okeechobee to Florida Bay. All students participate in these courses or field experiences. Sometimes there are fees for the more distant experiences; students who cannot afford them are often supported by the School of Environmental Studies Foundation.

Two features of these courses and field experiences are especially noteworthy. The first is that they are entirely consistent with and driven by the goals network. The transcripts of the teachers' interviews make this clear. More specifically, the theme courses address involvement in communities and becoming responsible worldwide citizens. The second feature is that the teachers report that, in journals and other assignments, students often state that the experiences are life changing.

When asked about instruction in the future, teachers' thoughts were clear and direct. They hope to maintain and extend what they are currently doing. They find great value in, and take great pride in, the student-centered, project-based, community-based, experiential education. They hope to create new projects and experiences, bring in many more speakers and community members and agencies, provide students more "real" audiences, and do more service learning. They are especially anxious to have the necessary time to engage the community. The time it takes to maintain and modify current relationships with the community is huge, especially in the face of increasing responsibilities, decreasing budgets, more regulation, and changing personnel at the agencies with which they work. Teachers long to create new connections to the community but are hampered because time away from their classrooms is unavailable.

One other related goal is to create a "culture where the students seek out and initiate their own opportunities." This is a phenomenal idea and it would be a terrific extension of the instructional goals. At first glance, this might seem like a "simple" way to increase engagement with the community, until one considers how much teaching needs to be done to prepare students, how much groundwork would have to be completed with the community, and how much mentoring of both the students and of the community would be required.

Despite the engaging instruction, or perhaps because of it, the teachers and principal worry. They worry about how budget cuts will eliminate teachers and thus make it impossible to engage the students as much as is needed. They worry about the slow drift toward more traditional instruction due to administrative decisions and political pressures. They worry about losing their ability to team teach and communicate across team and grade levels with fewer teachers, less financial support, more and more imposed state and district required tasks, and greater expectations for instantaneous communications with students, parents, and administrators via electronic media.

Finally, there is an emerging recognition that the instruction has to be enhanced by the use of more technology. As one teacher stated,

> [We] need more technology because that is students' language. As an older teacher I need to learn this. I am [left] out of all that. Students do not read books – I do – they use a Kindle. The [have and] need instant access to information – some is good some is not – how do they sift through this and get the real story and valid information? They need to be responsible consumers and we need to help.

Other teachers alluded to the need to enhance their own skills and to incorporate more and more sophisticated uses of technology into the instructional plans and into their daily, moment-to-moment teaching.

All of the above can be summarized by one teacher's stated hope and fears, "We must keep growing and exploring. We will not be an alternative [school] if we go back!"

Assessment

Two kinds of assessments were discussed by the teachers during the interviews. One was the assessment of the students; the other was the assessment of the overall effectiveness of the school.

As indicated in the goals network, the intention of the planners was that students be assessed in terms of the quality of their projects. By and large, this occurs. For example, one project is to write a paper about personal and public health, with the question being "Are there significant and credible environmental factors impacting the rate and severity of some disease in the human population?" Another example is the final assessment for the fall of the senior year, which consists of one question: "Can we manage for what we value?" For this work, students are expected to "pull pieces from what they have done and read and present how their understanding of the natural and social world has changed. [Their effort is to be based on] portfolios that are created along the way." Typically, students are directed to submit various parts of their projects as they develop them. The idea is that the teacher's "reading the final paper is to be done without a pen—and after grammar, structure, etc. are all taken care of along the way." In the end the students are evaluated on the academic quality of their understanding of the subject matters included in their investigation and on their writing skill. The writing evaluation includes everything from commenting on the forms of argument they use to the structure and organization of the paper to the grammar. In addition to the projects, students write journals, laboratory and field reports, and literary criticisms. Great emphasis is placed on the students learning to write well as one of the essential life skills.

In addition, students are also evaluated on the quality of their many oral presentations to the other students, teachers, parents, and community members. The senior students have eight to nine public speaking requirements. These presentations are often a part of their group's work. A critical idea behind the presentations is that "our students have to have an audience." One venue for the presentations is a model conference in which students can make a featured individual presentation

or a special-interest presentation with a partner, or serve on a panel, or present a poster. The students select what they want to do, depending on their comfort levels and preferences. At the end of the year, presentations are made in the evening to an audience the students invite—parents, a boss, a coach, a pastor, and a past favorite teacher—any adult whom they think should hear what they have to say. "This is a great night – there will be someone from the student's field and the kids get to shine and show what they know and care about and be supported and lifted up." Debates and theater-like performances also are used. One debate was modeled after an 1800s parliamentary debate in England about the colonization of the Congo. Theater-like performances range from using readings to presenting characters with roles to play. Great emphasis is placed on public speaking as another essential life skill.

Along the way the teachers also provide other, more typical tests. They do so for two reasons. The first is that the tests provide the teachers some insight as to how well the students are doing. The second is that the teachers came to realize that the students would face many typical kinds of tests in their future schooling or work and thus would benefit from some test-taking practice.

The way in which the school's performance is assessed overall surprised us. The usual standardized testing of students for college admissions or state standards has either been completed or occurred before the school has had time to have much of an impact on students' scores. When comparing schools in terms of student achievement, ACT scores are often used. School of Environmental Studies students do quite well in comparison to students in other schools, but there is no formal evaluation of School of Environmental Studies or any other school in the district. As one teacher put it, "This is a hole in the whole plan."

The school depends on amazing amounts of anecdotal evidence and stories. We cannot begin to recount the variety, breadth, and depth of this evidence: several examples and comments will have to suffice. We found their evidence of school success to be convincing.

One example is the change in the parents' conversations with the teachers. Parents are uncertain about the school and come to the first-year meetings with questions about everything the teachers do. During the senior year, the conversations with parents are about the positive academic and personal growth of their sons and daughters. The parents send their students' siblings to the school. As one teacher said, "We seldom miss a sibling." In addition, the parents tell the teachers about "their student's successes all the time."

The students communicate their success and dedication to the school in multiple ways, as well. "While students are here we see them – we see that they were not engaged and are now showing up and we see them working hard all the time." "We see their work and journals and their growth and happiness." In a year-end survey mostly related to social matters, the students report they feel safe—physically, emotionally, and academically. The students report that they like the small school, knowing their teachers and the other students, working together, and the style of the teaching. Cliques do not seem to be prevalent.

Finally, the students come back in large numbers. The teachers report that they hear back from students frequently, especially when they are home on breaks. They

come back to talk to the teachers and the current students. “They tell us how well they are prepared for college and their pursuits of careers in the world.” According to one teacher,

> Students come back and tell their stories – students never came back at other schools – some come back to teach with us – they tell us what they are doing in the world – they bring their journals and pictures that are part of their lives—we have an (active) alumni network that they run – students come back and help listen to presentations – mock trials – serve as judges etc.

A recent assembly day held before a holiday break had well over a hundred students return.

These stories matter to the teachers and to the community. However, teachers and the principal also expressed a strong desire to have a more formal evaluation and evaluation plan. External assessments were requested to help them see what they are doing and to help them think about what could be done better. They are concerned about whether or not they are continuing to meet the needs of their students. They hope for an external assessment of their work as a prompt and a basis for conducting internal deliberations about their school. They also want an evaluation that would allow them to report their successes and needs to the school district and community. They are somewhat perplexed by the fact that they are not as well recognized in the immediate community as they think is needed and warranted. We concur that it would be beneficial to conduct a thoughtful external assessment that involves past and current administrators and school planners, alumni and current students, parents, and community members and encourage them to critique the current goals and practices in the light of recent research and best practices.

Lessons Learned

An inquiry like this would be of little value without some statement of lessons learned. The following are presented for consideration, with full awareness that the inquiry was limited in scope. Even so, the views of the people who were interviewed matter, and the consistency of their views along with the absence of statements that contradicted what each said lends credibility to the lessons learned. What matters is context, time and resources, a network of goals, research, people, freedom, flexibility, community connections, accounting for complexity, and respect, with all of these factors being in play concurrently and continuously.

The context matters. The interactions among the practical needs of the school system, the zoo, the city, and the community provided the environment that allowed the school to be developed.

Providing substantial time and resources to the initial studies and planning matters. The goals network was created with these resources and became shared community property during the planning process.

A sustained network of goals matters. Nearly everything the teachers and principal said was related to the network of goals. The statements were about how the

goals were being used, what aspects of the school needed to be improved in the light of the goals, or what goals might need to be improved or changed in the future.

Research matters. In this case, research means the combined investigations of academic studies, best practices, the school system, and the community. Research generated the ideas and the foundation for the goal network.

People matter. The leadership from several sectors—the director of the zoo; the superintendent, other district administrators such as the curriculum director, the principal, and board members of the school district; the mayor and city council members; and especially the teachers who did the studies and made the plans—all of these people were essential. The hiring of teachers dedicated to the network of goals was also essential because without them the curriculum, instruction, and assessments would never have been developed.

Freedom matters. The teachers and principal all referenced the academic and political freedom they had to use what they knew about education. This freedom to plan an innovative school and the continuation of that freedom allowed them to elaborate and sustain their plans.

Flexibility matters. The school architecture and schedule allows teachers and students to interact in productive ways on a daily basis and in response to changing economic and political trends and to specific local, national and international events. Flexibility was especially important in allowing the teachers to collaborate and cooperate as they taught.

Connections to the community matter. The connections to the community provided real-world experiences and interactions with adults other than teachers and raised the standards and status of the students' work.

Accounting for complexity matters. Accounting for complexity means the teachers used many different ideas and skills to allow interactions among people and practices to inform decision making at the school. The network of goals was essential because it provided stability to their thinking as the particulars changed and adjustments were made.

Respect for a diversity of ideas matters. The above sections do not provide direct evidence of this, but the interviews are replete with references to the deep respect that all in the school have for each other's ideas and skills. Mutual respect allowed for a level of sharing of ideas about what is best for the children that was remarkable.

When taken one by one, many of the lessons we learned are neither unique nor surprising. What is unique, though, is that the specifics of what matters are highly interdependent. In our view, this school was built, was successful, and was sustained only because all the above factors were present.

The View from the Top of the Plateau

We expected to find that the use of the original mission of the school had diminished over time. We expected to see complacency, given that the school was on top of the plateau. We expected to see little in the way of concerns for the future of the school.

But we found little evidence that any of this was the case. Instead, we found that the school remains dedicated to the original goal network and uses it every day to plan and carry out the curriculum, instruction, and assessments. It continues to deeply engage students in their educations. The school also uses the goal network to make adjustments to the current circumstances on a regular basis. We wish you could hear the passion and dedication in the voices and comments of these teachers related to the goals.

We also wish you could hear the tinges of fear that they will not be able to do what they do because of a changing political climate, state requirements including accelerating demands for high-stakes, test-based accountability, administrative intrusions, and budget cuts. Their greatest fear is the loss of the time they need to think about and plan and coordinate what they can do for children.

If we wish to have innovations that will benefit our children and future citizens, perhaps listening to the voices from the top of this particular plateau would be useful.