

# ELEMENTARY AND MIDDLE SCHOOL AGRICULTURE CURRICULUM DEVELOPMENT: AN ACCOUNT OF TEACHER STRUGGLE AT COUNTRYSIDE CHARTER SCHOOL

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## Abstract

*The purpose of this qualitative case study was to document elementary and middle school teachers' progress in developing a food, agriculture, renewable resources, and environment (FARE) based curriculum and to describe how the use of a United States Department of Education grant provided resources that affected teachers' progress toward this end. A theoretical framework advocating peer interaction and expert guidance was used to guide the study. Interviews with six teachers and support staff were used to gather data to document efforts in curriculum development for a multi-aged charter school. Discourse analysis was used to interpret findings. Initially, teachers did not have sufficient training and experience to develop the FARE-based curriculum. In addition, the lack of organizational structure, time, materials, and the delay of completing facilities for the new school hampered teachers' curriculum development efforts. Resources provided by the USDE grant helped teachers develop a process for curriculum development and provided needed time. However, teachers' lack of curriculum development expertise, time, materials, resources, literature, and administrative support continued to hamper the FARE-based curriculum initiative in the charter school. These findings underscore the need for pre- and in-service teacher training on curriculum integration, for teacher time to develop new curriculum that includes collaborative work among teachers and uses local resources, and for administrative support for curriculum innovation in agriculturally-based charter schools.*

## Introduction

Charter schools are public schools that collaborate with public agencies, parents, teachers, school administrators, and others to create alternatives within the existing public school system. Charter schools are free, open to all, and are designed to be publicly accountable, creative, and flexible (National Institute on Student Achievement, Curriculum, and Assessment, 1998).

In 1993, Michigan was one of the first states to pass charter school legislation. After an initial battle in its Supreme Court, Michigan legislators passed the Michigan New Charter School Law (1994). This law's intent was for charter schools to

- (1) improve pupil achievement by improving the learning environment,
- (2) stimulate innovative teaching methods,
- (3) create new professional opportunities for teachers in a new type of public school in which the

school structure and educational program can be innovatively managed by teachers at the school site level, (4) achieve school accountability for educational outcomes by placing full responsibility for performance at the school districts, and (5) provide parents and pupils with greater choices among public schools. (p. 1)

In 1994, as a result of this legislation, six farmers in Berrien County, Michigan met to discuss educational options for their families and concluded that students needed to learn in non-conventional ways. As a result, they decided to create a charter school. Several years later, Countryside Charter School (CCS) opened to serve approximately 200 K-8<sup>th</sup> grade students. The school set forth a unique vision and was built on an idyllic site. The unique vision of the CCS's

teaching approach included (a) the integration of agricultural and environmental themes into the curricula, and (b) the use of a 75-acre land laboratory for experiential learning through food, agriculture, renewable resources, and environment (FARE) themes.

Four weeks before the school was to open, newly hired teachers were asked to develop an eight-week thematic unit of study for three grade level groupings: early elementary, upper elementary, and middle school. The curriculum was to include the following three components: (a) integration of FARE themes, (b) infusion of the Michigan Department of Education's (MDE) Curriculum Standards and Benchmarks (1996), and (c) use of the 75-acres of land. However, right after the school opened, a lack of time for curriculum development was identified as a primary constraint. The university consultant who helped design the school noted: "with just four weeks of planning prior to the start of school, teachers quickly became overwhelmed with the day-to-day preparation of lessons. The time needed to develop new curricula and thematic units was missing, and consequently, teachers confronted difficulties."

To remedy the situation, a proposal was submitted for an U.S. Department of Education (USDE) Charter School Grant. The proposal sought additional time during the summer of 1998 to plan and develop curriculum; the grant was awarded in April 1998. Additionally, grant funds were used to hire an educational consultant to help teachers with curriculum development and utilization of the 75-acre land laboratory for teaching and learning.

#### *Integrating the Curriculum Through Agriculture*

A number of studies underscore the importance of teaching agricultural topics at various grade levels. The National Research Council (NRC) (1988) coined the term "agricultural literacy" and suggested that agriculture was too important to be taught to only those in vocational education. Agricultural educators agreed and argued that agricultural concepts could be integrated into other subjects (Birkenholz,

Frick, Gardner, & Machtmes, 1994; Leising & Zilbert, 1994).

Although agricultural educators advocate the integration of agricultural concepts into other curricular areas, only a handful of studies have explored the needs of elementary and middle schoolteachers as they infuse agriculture into the curriculum. Humphrey, Stewart, and Linhardt, (1994) and Terry, Herring, and Larke (1994) found that teachers require assistance to integrate agriculture into the curriculum. They suggested that this assistance come in the form of developing teacher agricultural knowledge and developing their capacity to teach this content. Rudd and Hillison (1995) found that middle school teachers' agricultural knowledge influenced the inclusion of agricultural topics into the classroom curriculum. Concomitant to developing teachers' understanding of agricultural knowledge, Trexler and Suvedi (1998) have suggested, based on their field work with elementary and middle school teachers, that assistance should be provided to develop teachers' capacity to infuse agricultural concepts into curriculum.

Trexler and Suvedi's (1998) suggestion is noteworthy because research from outside of agricultural education has suggested that teachers negotiate many hardships on the road to curriculum integration. Interestingly, even those teachers who hold positive attitudes toward integration meet these obstacles (Wantaabe & Huntly, 1998). Lehman (1994) suggested that two of these hurdles are teachers' lack of time and their ignorance of resources to integrate curriculum. This is exacerbated by Beane's (1995) finding that most teachers fear covering content that is new to them and is compounded by Mason's (1996) discovery that most teachers are unaware of how to organize themselves to collaborate on curriculum integration. A final obstacle to integrating elementary and middle school curriculum is a lack of modeling in teacher preparation. Roebuck and Warden (1998) found that most prospective teachers are not shown models of integration in either their general education or their teaching methods courses, thereby limiting their ability to conceptualize an integrated curriculum. These insights underscore the need to

examine cases where teachers try to develop curricula that integrates agricultural themes into elementary and middle schools.

Teachers are not born with the ability to develop curriculum; they must learn this process. In this study, the researchers used Vygotsky's (1962) theory of social-cultural learning as a way to think about how teachers develop understanding and skills within a school's social network. Vygotsky argued that cognitive development is most likely to occur when there are differences in the perspectives of learners and when differences in competence exist. This theory can be extended to elementary and middle school-based agricultural education curriculum development because most teachers must learn both agricultural content and the process of integration. Based upon Vygotskian theory, an expert (possessing greater competence in both agricultural knowledge and experience with the curriculum integration process) and social interaction would be needed to help teachers develop cognitive structures and skills needed to develop an integrated curriculum. As suggested by Trexler and Suvedi (1998) the resource of time is also a necessity to integrate agricultural concepts into the curricula. Jacobs (1989) also stressed this requirement by asserting that "time is currency of education; what teachers can imagine and do is limited by the time they have to plan and to prepare" (p. 9). The study's theoretical framework was operationalized through the grant, and its conceptual framework hinged on providing time for peer interaction and expert guidance for curriculum design.

### **Purpose/Guiding Questions**

Based on this conceptual framework, this case study's purpose was to document teachers' progress in developing a FARE-based curriculum and describe how the use of the USDE grant funds provided resources that affected teachers' progress toward this aim. The following questions guided the study. (1) What were the teachers' backgrounds prior to teaching at CCS? (2) How did the curriculum development process in the first year compare with the second? (3) What practices were helpful or unhelpful for the curriculum development

process? (4) How were the FARE themes integrated into the curriculum? (5) What did teachers need so that they could improve future curriculum development?

### **Methodology**

In this study the researchers employed a qualitative methodology to understand and interpret (Guba & Lincoln, 1981; Koetting, 1986) teachers' thoughts about and feelings toward the integration of agricultural themes into a school-wide curriculum. Guba and Lincoln (1989) have argued that educational program evaluations hinge on the co-construction of meaning based on a dialogic process between participants and researchers. Because of this study's limited number of participants, the researchers used the focused interview technique to foster dialogue and to enhance the collection of "rich" data (Merton, Fiske & Kendall, 1952).

### *Population*

This study's population was six teachers (all staff involved in the process of curriculum development) and the support staff hired after curriculum was developed in the summer of the second year. All teachers had taught in the charter school since its inception and were involved in curriculum development during the summers of both years. These teachers taught different multi-aged grade levels: one kindergarten, two-first and second grades combined, one-third and fourth grades combined, one-fifth and sixth grades combined, and one-sixth through ninth grade.

### *Data Collection*

Two interviews were conducted with each of the six teachers. The interviews were designed to elicit information that answered the study's five questions. Interviews were conducted in classrooms without students present. Responses to questions were audio taped and transcribed, serving as the primary data. In addition, data were collected by interviewing those people who supported the teachers: (a) the university consultant for the school, (b) the agriscience program coordinator<sup>2</sup>, and (c) the curriculum coordinator<sup>3</sup>. These

interviews provided information that helped illuminate this study's context.

#### *Analysis of Data*

Discourse analysis (Tannen, 1989) was used to interpret meaning of participants as they talked about their ideas and impressions of the study's guiding questions. Analysis followed a four-phase process. First, raw data from interview tapes were reviewed and salient parts of each interview were transcribed for further analysis. In the second phase, strips of conversation from the raw data were coded to allow for reassembly into the essence of shared meaning (Strauss, 1987) and placed into "bins" for organization (Miles & Huberman, 1984). In phase three of analysis, the researchers sought confirming and disconfirming evidence of patterns among groups and individuals. In the final

phase of data analysis, researchers determined the trustworthiness (Lincoln & Guba, 1985; Michler, 1990) of findings and conclusions by asking informants to comment on a final draft of the study. Informants provided both oral and written suggestions to clarify findings and conclusions, which were integrated into this paper. In other words, by triangulating the researchers' findings and conclusions with a member check, the informants validated the accuracy of their interpretations.

#### **Findings**

##### *Question 1: What were the teachers' backgrounds prior to teaching at CCS?*

Overall, previous teaching experiences of the informants were relatively short. Teachers' backgrounds and previous teaching experiences are described in Table 1.

Table 1  
*Previous teaching background and experiences*

| <i>Teacher</i>   | <i>Background and experiences</i>   |
|--|---|
| Mary – K teacher<br>(White female)   | <ul style="list-style-type: none"> <li>• Taught as a substitute teacher and preschool for 1 year</li> <li>• Taught writing and reading in a community school</li> <li>• Experienced teaching outdoors and developing curriculum</li> </ul>  |
| Linda - 1 <sup>st</sup> -2 <sup>nd</sup> grade<br>teacher<br>(White female)  | <ul style="list-style-type: none"> <li>• Taught preschool and sixth grade math and science for 1 year</li> <li>• Experienced teaching outdoors with hands-on materials</li> </ul>   |
| Diane - 1 <sup>st</sup> - 2 <sup>nd</sup> grade<br>teacher<br>(White female) | <ul style="list-style-type: none"> <li>• Taught as a substitute teacher for one semester and preschool for 1 year</li> <li>• Taught art at summer day camps for two summers and developed curriculum</li> <li>• Experienced teaching art in an outdoor setting</li> </ul>               |
| Sandy - 3 <sup>rd</sup> -4 <sup>th</sup> grade<br>teacher<br>(White female)  | <ul style="list-style-type: none"> <li>• Taught in a public school for 7 years</li> <li>• Taught environmental topics and outdoors</li> <li>• Experienced National Standards and Benchmarks for science</li> <li>• Experienced developing curriculum (2-week thematic units)</li> </ul> |
| Jennifer – 5 <sup>th</sup> -6 <sup>th</sup> grade<br>teacher (White female)  | <ul style="list-style-type: none"> <li>• Taught fourth grade for 2 years</li> </ul>   |
| Lorry - 6 <sup>th</sup> -9 <sup>th</sup> grade teacher<br>(White female)     | <ul style="list-style-type: none"> <li>• Tutored math for 6 years</li> <li>• Taught as a substitute teacher for 3 years</li> </ul>  |

The majority of teachers' formal teaching experience was approximately 1 year, except for Sandy, who had taught a total of 7 years. In addition, only Sandy had experience with teaching environmental topics, while four teachers had taught in outdoor settings previously. Two of the four obtained these experiences in special school settings, such as before and after-school programs and summer day camps.

The researchers investigated teachers' knowledge and use of MDE Standards and Benchmarks, which were to be used to structure lessons. All teachers indicated that they had no previous experience with MDE Standards and Benchmarks. Sandy had used National Standards and Benchmarks for science to develop experimental activities in Louisiana. As for teachers' experiences with curriculum development, three teachers had developed curriculum in some way. Mary had developed reading and writing kits, while Diane had created curriculum for a summer day camp. Sandy also developed two, 2-week thematic units for first grade in her previous school. On the other hand, the remaining three teachers had no experience with curriculum development. Jennifer's statement represented the remaining teachers' experiences:

[In the previous school] the curriculum was already in place and we had to teach from that. They didn't stress the benchmarks and standards very much. Then, I came here and we were expected to know how to start from scratch.

*Question 2: How did the curriculum development in Year 1 compare with year 2?*

#### *Curriculum Development in Year 1*

Informants were asked to explain how they developed the curriculum the first year. The university consultant described the context of the school. He indicated that in the summer prior to the opening of school, four weeks prior to the school's opening, teachers began developing a curriculum for the first 8-week unit. When the school was about to open, the entire facility was not ready. The building had not been completed, so teachers could not get inside

their classrooms until one week before the opening. Even after the building was completed, many essentials were still missing such as desks, chairs, books, computers, and so forth. As a result, the school postponed its opening for two days. As school began, organizing and establishing school systems—attendance, lunch count, grading, child pick-up, etc, took up time.

By devoting time to these organizational systems, teachers indicated that they barely managed to develop the first 8-week unit and had little time to develop a curriculum for the rest of the year. Three teachers indicated that, for the rest of the year, preparing to teach was a day-by-day process. Diane recalled the year:

I don't know anyone who developed the next nine weeks. I didn't develop. I was barely planning the night before the next day. It was very, very, overwhelming.

Mary and Sandy developed their curriculum with their own knowledge and information. Mary started development by selecting topics based upon her experiences with pre-kindergarten aged children and from books that suggested appropriate topics for specific ages of children. Then, in accordance with these topics, she created the units and activities. Similarly, Sandy had success in curriculum development. She said she used a nine-step plan for writing thematic units based on MDE curriculum Standards and Benchmarks. Sandy acquired this planning model from a Berrien County Intermediate School District workshop.

#### *Curriculum Development in Year 2*

Informants were also asked how they developed FARE-based curriculum units during the summer of the second year. Teachers were provided 20 paid-days for curriculum development during that summer. The university consultant led a series of four meetings for all teachers and school staff members. In these meetings, they: (a) selected agriculturally based themes to frame the curriculum, (b) chose MDE Standards and Benchmarks for the themes, and (c) divided the Standards and Benchmarks by grade levels within the

entire group. Then, teachers developed curriculum individually and in grade level groups to develop actual units of instruction.

During the summer, Mary, Linda, and Diane worked collaboratively. They first worked individually and then met together to discuss their ideas. They developed a procedure to develop lessons that included: (a) listing all the MDE Standards and Benchmarks and appropriate themes, (b) identifying resources at teachers' stores and through the Internet, and (c) designing teaching activities. In addition, Sandy and Jennifer also supported each other through collaboration.

Lorry was the only teacher who did not have another teacher with whom to work. She stated that she found it difficult to develop a curriculum without guidelines, frequent support from other teachers, and time. She also indicated that teachers at higher grades (she taught 7-9) were required to do more work than teachers in lower grades. She said:

I know what topics should be in there but there is not enough time to find all the resources and activities for upper grades. Lower grades have all kinds of stuff out there. . . . In the case of the upper grades, you can't just jump on the Internet and find as much as you can for K-6.

*Question 3: What practices were helpful or unhelpful for the curriculum development process?*

#### *Helpful*

Informants were asked to describe things helpful to the curriculum development process. No teacher identified anything helpful in the first year. However, half of the teachers mentioned that the twenty days in the summer of the second year helped them develop the first 8-week unit. Diane said that the series of four summer meetings facilitated the exchange of ideas with other teachers.

Five teachers remarked that collaborative work was very helpful. Three of them also mentioned that support from the agriscience program coordinator and the university consultant was helpful. Additionally, both Diane and Jennifer indicated that creating a framework for

curriculum development in the second year made an enormous difference. Diane stated that:

This year [the second year], we have a skeleton. That's what I feel. We have all the bones in place. And I just need to put in the muscles and the tissues and make it run.

#### *Unhelpful*

As discussed previously, time constraints were the most commonly mentioned hindrance throughout the interviews. After the twenty days of summer planning, teachers were asked to develop three additional eight-week units for the rest of the year. Three monthly release days were allowed for the development of these additional units. Although the time constraint was lessened, once school began teachers again felt overburdened. Their having the day-to-day responsibility of teaching, they said, exacerbated this. Mary and Diane stated that they spent a tremendous amount of out-of-school time on curriculum development. Diane remarked:

I did not want to work without being paid and so I did enough to get it done. . . . I think it could have been done better. There could have been more extensions, more connections. I may have had more time to look into field trips . . . . Three and a half days to develop eight weeks. It's just crazy. . . . Still we are doing a lot of work out of school not being paid for it.

Half of the teachers stated school administrative support was insufficient. Some teachers empathized that the curriculum coordinator was given additional administrative duties and, as a result, did not have time to work with them on curriculum development. Mary also mentioned that her lesson planning was hindered because lack of support for selecting Standards and Benchmarks in the second year. Diane remarked that, if she had a model curriculum or an outline of a procedure for its development, it would have been easier for her in the first year.

*Question 4: How were the FARE themes integrated into the curriculum?*

Each told a different story in response to the question about how they integrated the FARE themes into curriculum. Mary created the unit and its main theme first and then found some parts of the unit that could be combined with the FARE themes. She said most content at the kindergarten level did not deal with the FARE themes. For example, she developed a project on corn to teach the importance of plants. This project taught the scientific concept of producers and consumers and about the origin of this staple crop. Additionally, it focused on corn growth requirements, consumers' concerns, and traced corn's path to consumption.

Sandy provided another example of FARE-theme integration. She integrated the FARE themes into curriculum through a series of activities. The main topic for the fall of the second year was economics and her project for this unit focused on production of a molasses product. Two third and fourth grade classes took a field trip to help harvest sorghum and observed the pressing of sorghum into molasses. They then used some of the molasses to make cookies and popcorn balls, which they later sold. The students planned the amounts of all ingredients needed, shopped for ingredients, measured and mixed ingredients to make products, advertised, estimated the cost per batch and per cookie, decided on price per item, collected money, made change, and decided on ways to spend the profits after repaying a loan.

The majority of teachers found FARE-theme integration more difficult. Diane mentioned that integration of the FARE themes was very arduous. She believed that her limited knowledge about outdoor activities and FARE themes contributed to her difficulties.

*Question 5: What did teachers need so that they could improve future curriculum development?*

The last question addressed teachers' needs for future curriculum development. All teachers indicated that time was the primary limiting factor, while most teachers indicated the need for more support from the curriculum coordinator. More specifically,

Mary stated that she needed more support with identifying benchmarks and developing curriculum scope and sequence, while Lorry needed help with searching for resources and preparing activities.

Inservice education was also a concern for the teachers. Mary and Lorry pointed out that this was a problem. Mary remarked:

That [curriculum development] was a big expectation of our job, and we have never been trained for it. It's just kind of thrown into there and do it . . . and they [the schools administration] do provide days for us, but the support is not there. Like education is not there.

Lorry echoed the need for in-service training. She lamented:

I am a teacher, [I'm] not trained to develop a curriculum. So, we are all nervous about it. We have no experiences doing it.

Materials and resources for curriculum planning were also mentioned as needs. Lorry suggested that if the school had an educational library with these materials, it could help teachers with curriculum development. In addition, she suggested allowing teachers to spend some time for curriculum development in a neighboring library. She commented:

Not having an educational library here makes it very difficult. If I can spend a curriculum day at Western [Western Michigan University], at libraries looking up different resources, instead of having it to be here in school, it would be a big help.

### **Conclusions/Recommendations/ Implications**

Even though the study used tested qualitative methods, it should be acknowledged that this study's conclusions pertain to a school-specific context and reflect the views of a limited number of informants. The study brings forth what Erickson (1986) termed "concrete universals," in this case, Countryside Charter School's teachers' feelings,

frustrations, and experiences. These conclusions differ epistemologically from those posited from quantitative studies because they are not meant as abstract universals built by generalizing from a sample to a population. Rather, a specific case was described in detail to shed light on concrete perspectives. Others interested in the topic may take these contextualized findings and compare them with other similar contexts, thereby determining their universality. Similarly, recommendations and implications—specific to this case—may be of import to others interested in developing agricultural education charter schools in comparable contexts.

### *Conclusions*

Expectations of the school's administrators exceeded the abilities of the teachers in this study given their listed restraints. During the first year, teachers did not have sufficient training to fulfill a major task at CCS—the development of the FARE-based curriculum. In addition, the to the lack of skills, organizational structure, time, materials, and the delay of completing the school facilities hampered teachers' curriculum development efforts.

The curriculum development process was further hindered because of the staff's inexperience and unfamiliarity with agriculture and with teaching “out of doors.” This confirms Beane's (1995) finding that teachers fear coverage of content and use of teaching methods that are new to them. It is noteworthy that no teachers alluded to the need for help with integrating the FARE themes or infusing the land laboratory into instruction. This may be because teachers—overwhelmed as they felt—did not have enough time to pay sufficient attention to FARE-theme integration and use of the land laboratory; may have felt uncomfortable with teaching beyond the confines of the classroom, or may not have been vested in the agriculturally-based vision of the school.

The demands of designing a FARE-based curriculum from scratch were overwhelming. Teachers felt that there were few structures in place to support them in their assigned duties. They lacked processes for curriculum development and were initially unable to work collaboratively.

Others have noted similar obstacles. Roebuck and Warden (1996) found that preservice teachers do not take integrated classes in their preparation to teach and do not experience methods classes with teams of faculty and, therefore, have difficulty conceptualizing how to integrate the curricula. In addition, Mason (1996) has contended that teachers do not know how to collaborate because of the isolated structure of most schools.

Overall, the most urgent need for curriculum development at CCS was more time. Other barriers for teachers' curriculum development were a lack of materials, resources, and literature. Teachers believed they wasted time searching for resources in bookstores, teachers' stores, or in libraries. In science education, similar negative perceptions have been noted with regard to a lack of time for curriculum integration and teachers inability to locate materials (Lehman, 1994). Finally, teachers perceived a lack of support from the curriculum coordinator, who, they believed could have streamlined the process of developing a FARE-based curriculum.

In the second year, the USDE grant provided teachers with sufficient time to create the first 8-week unit. The grant activities also encouraged collaborative work among teachers because they arranged their schedules to work together. In addition, teachers collaborated to create a vision for and a process to develop curriculum.

### *Recommendations/Implications*

Based upon the conclusions above, the following recommendations were offered to CCS to realize its vision for teaching and learning through a FARE-based curriculum: (a) expand the three days for curriculum development for each unit and provide additional time for curriculum development within the school day, (b) provide in-service training to enhance teachers' skills for curriculum development, (c) Promote collaborative work among teachers, (d) Implement a standardized procedure to integrate the FARE themes into curriculum and to utilize the land laboratory, (e) Reevaluate the curriculum coordinator's priorities and stress curriculum development

so that more time is provided with teachers, and (f) Provide materials for curriculum development and develop a professional library.

Implications from this study may be cautiously drawn to other situations, because this single case may be emblematic of other charter schools that are planned with agriculturally based themes. As a result, implications may be logically inferred to at least four groups: (a) boards of education, (b) school administrators, (c) educational policy makers, and (d) university professors.

To clear many of the hurdles similar to those encountered in this case, boards of education and school administrators planning charter schools may profit greatly if—prior to opening a charter school—time and resources are provided to build teacher capacity for developing curriculum. Additionally, time—solely for curriculum development activities and networking during regular school hours—would provide for ongoing development and refinement of curricula.

Along the same line, educational policymakers advocating charter schools as a means to strengthen public education may consider channeling funds for these efforts prior to their inception. Resources for planning and support would do much to undergird the foundations of these schools. The practice of providing funds to charter schools, only after students are enrolled, led to many of the difficulties encountered by these teachers. To develop school structures, funds for start-up and curriculum planning are needed well in advance of student arrival.

Finally, university professors may look to the case of CCS as a snapshot of one school's struggle to develop a curriculum based on the study of FARE. Questions arise and may be considered as agricultural educators broaden their mission to increase the breadth of their discipline. These questions include, but are not limited to (a) What types of knowledge and skills are necessary for teachers to develop an agriculturally based curriculum?, (b) Do agricultural resource/curriculum/infusion specialists need to be trained by universities for elementary and middle school?, (c) How will universities help build the capacity of

pre- and inservice teachers to develop an integrated agriculturally based curriculum?, and (d) Are there similar cases of charter schools based on agricultural themes that can be studied in detail to glean a deeper understanding of the processes involved in founding such schools?

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### Footnotes

<sup>1</sup>This university consultant designed the initial organizational plan for the school. In addition, he met regularly with staff to provide assistance with curriculum development during the summer of 1998. He was formerly a high school agriculture teacher, an administrator of an elementary program that used agriculture as a theme for

science education, and a university specialist.

<sup>2</sup>The agriscience program coordinator joined the staff at CCS in August 1998. His primary role was to assist with FARE theme integration and by developing the 75-acre land laboratory. He was previously a high school agriscience education teacher; this was his first experience assisting elementary educators in a formalized role.

<sup>3</sup>The curriculum coordinator joined the staff at CCS in August 1998. Her primary role was to assist teachers with curriculum coordination. She was experienced in elementary and middle school as a teacher and teacher consultant; this was her first year as a curriculum coordinator.