Exploring Horticulture in Human Culture: An Interdisciplinary Approach to Youth Education

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Summart. By examining the ways that societies have raised and prepared their predominant food crops, students can gain insights into horticultural methods and origins of food, and develop an awareness of and appreciation for diverse cultural heritage. An interdisciplinary approach to the subject permits young people to synthesize information from diverse sources and to understand the important historic relationship between humans and plants.

Elementary and secondary school social science curricula have been criticized for failing to provide an integrative framework for subject matter, and an excessive emphasis on Western cultural perspectives. Few argue with the need to provide a multicultural focus in education, but the framework for such a curriculum has been difficult to identify.

Studies of the importance and development of major foods may provide such a framework for integrating diverse subject matter with a multicultural focus. In this paper, I argue that exploring "human culture and horticulture" is an excellent approach

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to provide interdisciplinary studies with a multicultural focus.

A poverty in horticultural science education

The lack of emphasis on plants in school curricula has been well-documented (Flannery, 1991; Hershey, 1992; Honey, 1987; Walch, 1975). Many reasons have been suggested for this educational gap, including: That teachers find plants much less exciting than animals, and that they share this attitude with students (Flannery, 1991); that most people are "animal chauvinists" (Darley, 1990); or that school science texts devote considerably less time to plants (Honey, 1987). Wood-Robinson (1991) revealed startling misconceptions about plants by young people, demonstrating the need for more work in the area of students' understanding of many aspects of the functioning of plants and human relationships to plants.

Honey (1987) suggests that the knowledge and experience of plants that we receive in daily life does not relate to plant biochemistry, for example, but more probably does to whole plants or large portions of plants. Reductionist approaches (e.g., encouraging memorization of the Krebs cycle as opposed to providing an overview of the relevance of photosynthesis) are indisputably inappropriate for youth. Young people tend to be enthused about subjects that correspond to their life experiences. Considering that they relate more readily to animals and people, it follows that a general education that provides an understanding of the economic use of plants and their products, conservation and environmental issues, the fundamental importance of plants to people, or the historic relationship of people and plants would excite more effectively an interest in plants among students (Honey, 1987). We critically need captivating new resources developed with the intent of expressing a broadly based approach to plant science and horticulture.

The need for a multicultural focus

Just as people relate more readily to situations that are familiar to them, students learn best and are more motivated when the school curriculum reflects their cultures, experiences, and perspectives (Banks, 1989). It follows that the most-effective educational agenda in our diverse society would be one into which multicultural components are incorporated. Our world's future depends on how well people can learn to live with each other, and on an understanding of and respect for people whose ways are different (Brown, 1963). A focus on multicultural perspectives in youth education can influence attitudes positively, foster acceptance of other people, and inspire social change.

Multicultural education is concerned with altering the total educational environment so that it reflects ethnic diversity better within society. It promotes respect for a wide range of cultural groups and enables these groups to experience equal educational opportunity (Banks, 1979). Multicultural education should *not* be a specialized course or two added to the curriculum as a token for minorities. Nor should it be the addition of a long list of ethnic groups and heroes. Instead, an infusion of various perspectives and frames of reference in all parts of the curricula from cultural groups is necessary to enrich young people's understandings of the nature and complexity of society (Banks, 1989).

Building a multicultural foundation into curricula can provide an excellent chance to reexamine the purposes of the curriculum and its relationship or conflict with contemporary assumptions and goals (Banks, 1979). Cornelius (1992) contends that current curricula reinforce stereotypes, providing an inadequate view of diverse cultures, while multicultural education has focused more on equitv issues than on how to teach about diverse cultures. She suggests that studying cultures from a culture-based curriculum framework would provide the basis for understanding and developing an appreciation of cultural diversity. As this challenge is explored more' fully, the horticultural sciences could provide an opportunity for demonstrating the contributions-to society from different cultures, particularly in the area of food crops. The widespread adoption of "ethnic" foods by mainstream American society makes food crops an ideal vehicle for implementing multicultural approaches to education.

Plants and people—a critical link

I assert that we should consider the contributions of plants and horticultural methods by human societies as we reevaluate both multicultural and plant-related content in school curricula. By examining the ways that cultures have raised their predominant crops, youth could gain insights into the importance of plants in the lives of people. They would increase their knowledge of where their food comes from. discover how people have altered their environments to make plants grow, and develop skills in basic horticultural science. In addition, as society becomes increasingly aware of questionable environmental impacts of recent agricultural practices, looking to other cultures could provide students with an alternative viewpoint for seeking new strategies.

Simultaneously, young people would gain respect for different cultures. For example, corn is the most important food contribution to the rest of the world by the Americas. Corn types were developed and nurtured by native Americans hundreds of years ago, and the reverence for this crop perseveres in those cultures today. Understanding this provides a vastly different image of the "Indian" from the "beads and feathers" Hollywood depiction that many people share. Exploring horticultural meth - ods unique to various cultures would allow youth to examine people and their relationships with plants in a way that elevates students beyond perceived stereotypes.

This "human culture and horticulture" approach lends itself very well to the current interest in interdisciplinary teaching. Miller and McCartan (1990) emphasize the importance of a more integrated curriculum, and define a genuinely interdisciplinary program as one with a common approach to a common problem that is distinct from those of the traditional disciplines. Hess (1991) illustrated the importance to children of finding relationships among the facts; instead of learning isolated bits of information, they attempt to integrate them into a better understanding of the subject. Interdisciplinary methods assist children in achieving this integrated learning.

The interdisciplinary approach has other benefits as well. For example, combining horticulture with literature allows infusion of science, while combining literature with horticulture allows infusion of story-telling. Hess

(1991) submitted that reading comprehension is improved when the reader has a motive for reading. Students enjoy a good story; using literature to teach science allows them to move easily from a comfortable area. such as literature, to a less comfortable one, such as science (Butzow et al., 1988). The academic community no longer views fiction singularly as a means for escape or adventure. This broader view of literature enables teachers to think more openly about using a variety of written materials across the curriculum (Smith, 1991).

Some examples

Integrating culture with horticulture may bean excellent idea in theory, but perhaps more of a challenge in practice. One might question the compatibility of subjects such as horticultural science, social studies, or history. The "Seeds of Change, Story of Cultural Exchange after 1492 ," is a joint project of the National Museum of Natural History, Smithsonian Institution, and the National Council for Social Studies (Hawke et al.. 1992). This cooperative venture has produced research, exhibits, publications, and programs that successfully demonstrate the culture–horticulture link.

Tech (1993) reported on an example of curriculum reform that introduced the "Seeds of Change" with great success. At the University'Heights High School in the Bronx, N. Y., the academic school day is divided into six interdisciplinary teams that spend a semester with 60 students studying various themes. Consider the following:

"This fall, a team of four University Heights teachers and 60 students concentrated on the theme 'seeds of change'—the Columbian exchange of plants and animals between Europe and the Americas during the Age of Discovery. The 'seeds'—corn, sugar cane, horses—became a vehicle for studying botany, chemistry, geography, economics, politics, math, history, literature and art.. .Students are putting facts together [and] they understand the relationship of the information they are learning." (Tech, 1993).

Tochpoints out that this approach has demonstrable benefits; students who have undertaken this new method in places such as University Heights, and in a similar interdisciplinary program in Los Angeles schools, reportedly wrote better than their peers, had a stronger grasp of abstract-concepts, and, as a group, were absent from school less and dropped out at a lower rate.

Another excellent illustration of the exciting synthesis of human culture with horticulture is *The Hupobi Heritage Project,* which connects young people with the ancient inhabitants of the Hupobi lands (Lippitt et al., 1993). These ancient peoples practiced dryland farming to meet the challenges of a hot, arid environment; children discover evidence of their resourcefulness in adapting to the dry climate of the pinyon–juniper lands by examining the designs of their terraced gardens. Teachers and students at the Santa Fe Indian School collaborated with the New Mexico Bureau of Land Management to explore the natural methods selected over centuries by Hupobis, and consequently developed a science curriculum focusing on dryland agriculture. This curriculum contains such activities as observing the effect of erosion on soil samples. comparing the relative rate and depth of water infiltration in soil samples, and demonstrating gravel mulching and waffle-garden techniques. As the young people involved in this project have undergone these activities, they have achieved a new perspective on finding solutions to current problems and have gained some very relevant scientific insights, while acquiring a respect for the endeavors of an ancient culture.

The Thee Sisters: Exploring an Iroquois Garden attempts to help young people gain a more-accurate impression of native American culture by examining the way that Iroquois people grow and care for their crops (Eames-Sheavly, 1993). Exploring foods, customs. and stories that have evolved around corn, beans, and squash provides a background into attitudes that surround these native crops. Planting the three sisters familiarizes students with a distinctive crop management system, introduces them to plant breeding concepts, encourages an observation of how crop respond to interplanting, and acquaints them with biodiversity issues. Early attitudinal data have suggested that individuals using the publication have changed ideas as to the nature of Iroquois people and their contribution to contemporary agriculture in the northeastern United States.

The Great American Peanut introduces youth to the history and botany of the peanut (M. Eames-Sheavly, unpublished manuscript). Young people follow the peanut from its cultivation in the pre-Columbian Andes to its present recognition as an important world crop. They are introduced to the limitations of growing crops in northern climates and are given the challenge of designing a method for extending the growing season for peanut production in the northeastern United States. While *The Great American Peanut* traces the peanut from its journey from Africa to the United States via slave ships, it also follows the paths and contributions of African-Americans. Significant portions of the manuscript are told in a story -format through the eyes of a fictional character, and students are introduced to the botany and culture of the peanut as this character reflects on the care of this crop.

Conclusion

More effort could be made to provide young people with an appreciation for cultural diversity. Concurrently, more work needs to be done to give youth access to plant science. One approach that would satisfy each of these needs is to consider the contributions of plants and horticultural methods by human societies as we reevaluate both multicultural and plant-related content in school curricula. For example, we should encourage the development of interdisciplinary courses taught cooperatively by social science and horticulture instructors. Examining the ways that societies have raised their predominant crops could provide youth with insights into the importance of plants in the lives of people, while increasing their knowledge of the origin of their food, and discovering how people have altered their environments to make plants grow; an example would be introducing a socio-cultural focus into traditional 4-H plant-science projects. These approaches are more reflective of the way that children assimilate information, bemuse they relate better to subjects that correspond with their life experiences. After all, from the dinner table to the playground, there are few disciplines that affect our lives as frequently or enduringly as horticulture.

Literature Cited

Banks, J.A. 1979. Teaching ethnic studies: Rationale, trends, and goals. Teaching strategies for ethnic studies. Allyn and Bacon, Boston.

Banks, J.A. 1989. Integrating the curriculum with ethnic content: Approaches and guidelines. Multicultural education: Issues and perspectives. Allyn and Bacon, Needham Heights, Mass.

Brown, I.C. 1963. Understanding other cultures. Prentice Hall, Englewood Cliffs, N.J.

Butzow, J. and C. Butzow. 1988. Make science livelier with children's fiction. Learning 16:50–53.

Cornelius, C.A. 1992. A culture-based curriculum framework: the role of corn in Iroquois worldview. PhD Diss., Cornell Univ., Ithaca, N.Y.

Darley, W.M. 1990. The essence of 'pliantness.' Amer. Biol. Teach. 52:354-357.

Eames-Sheavly, M. 1993. The three sisters: Exploring an Iroquois garden. Cornell Coop. Ext. Info. Bul. 142LM15., Ithaca, N.Y.

Flannery, M. C. 1991. Considering plants. Amer. Biol. Teach. 53: 306–309.

Hess, M.L. 1991. Understanding nonfiction: Purpose, classification, response. Language Arts 68:228-232.

Hershey, D. 1992. Making plant biology curricula relevant. Bioscience 42:188–191.

Hawke, S.D. and J.E. Davis. 1992. Seeds of change, the story of cultural exchange after 1492. Addison-Wesley, Reading, Mass.

Honey, J. IV. 1987. Where have all the flowers gone ?—The place of plants in school sciences. J. Biol. Educ. 21:185–189.

Lippott L., T.L. Nickerson, D. Bailey, and S.L. Fosberg. 1993. Environmental technology is an ancient science. Sci. and Children 30:21-28.

Miller, M.A. and A.M. McCartan. 1990. Making the case for new interdisciplinary programs. Change 22:28-35.

Smith, C.B. 1991. Using literature across the curriculum. The Reading Teacher 44:516-517.

Toch, T. 1993. The perfect school—Nine reforms to revolutionize American education. U.S. News and World Rpt. 11 Jan.

Walch, P.E. 1975. Blindfold botanists as a motivational force for high school biology students. Sc. Teach. 42:4041.

Wood-Robinson, C. 1991. Young people's ideas about plants. Stud. Sci. Educ. 19:119–135.