ETHICS AND AGRICULTURAL EDUCATION: DETERMINING NEEDS

Billye Foster
University of Arizona

ABSTRACT

The primary purpose of this study was to determine which areas of ethical agricultural issues are perceived by secondary teachers to be most critical to the general consuming public and, therefore, students of agriculture. This study was limited to ten western states. As consumers, the teachers involved in this study were very interested in the areas of ethical agricultural issues regarding land use and water sources. They targeted Right to Farm—conversion of agricultural land to urban development; Water rights control; and Public land used for agricultural purposes. When ranking relevance to their curriculum teachers substituted Chemical water pollution for Public land used for agricultural purposes.

Consumers today are faced with a changing world, both through technology and public opinion. As the consuming public becomes more interested in techniques used in the production of the food and fiber they demand, the agriculturist must necessarily become more involved in public relations. As Charles Blatz so eloquently points out in his book, *Ethics and Agriculture: An anthology on current issues in world context*:

> Agriculture is changing around the world. The most dramatic of these changes threaten the very ability of humanity to produce the food needed to sustain itself. Yes, we are producing more on less land with less human effort, but some of our methods deteriorate the resources to such an extent that the production lives of many important agricultural areas can be numbered, not in centuries, but in decades (Blatz, 1991, p. 1).

As the world views agricultural issues in a new light, the consuming public has become more interested in production techniques (Elliot & Olson, 1995). Consumers also have become actively involved in the management of public lands. Across the western United States, as well as the entire nation, recreation and tourism have become major sources of income to both individuals and state governments. Less than two percent of the population is involved in production agriculture (American Farm Bureau, 1997). However, 100 percent of the population is involved in the consumption of agricultural products.

Ethical issues pervade daily operations in all phases of the agricultural industry. Vice-President, Al Gore eludes to these concerns throughout his book *Earth in the Balance: Ecology and the*

Human Spirit. "Today, we enthusiastically participate in what is in essence a massive and unprecedented experiment with the natural systems of the global environment, with little regard for the moral consequence" (Gore, 1993). This quote follows a dissertation comparing the atrocities of Hitler and Stalin to the environmental destruction on the planet that society tolerates.

Review of Relevant Literature

Other professional and educational areas have identified numerous attempts to incorporate ethical issues into a variety of curricula. Bundy (1995) reported on an experiment by the University of California at Berkeley's Boalt Hall School of Law to include a professional responsibility course in the first-year curriculum. Conclusions drawn from the study showed that due to the emphasis on the mastery of conventional legal analysis, student interest in professional responsibility may be ambivalent. There was no report on the continuation of the course. Stevens and Allen (1996) noted the ethical principles to be taught must be consistent with those in the Declaration of Independence, the United States Constitution and its interpretations by the United States Supreme Court. Another profession with opportunities to deal with ethical issues surfaces in the field of medicine. A study, that utilized patient-led discussions in a genetics course to increase interaction of sensitive issues between patients and professionals, emphasized the unity of science, medicine and humanism through the problems and solutions offered by genetics (Williamson, 1996).

Few areas in agriculture have gone untouched by the debate over ethical issues. Ethical questions and issues have evolved in areas encompassing topics ranging from livestock show ring ethics to the use of animals in research laboratories. Other issues addressed range from control of natural resources and public lands to long-term effects of genetically altered food supplies. As these ethical questions have inundated agricultural professionals, the question for the agriculturist becomes one of responsibility. Agricultural education professionals need to become more and more proficient in the area of communication. In 1995 Jim Olsen and Jack Elliot completed a study that identified agricultural and environmental issues as seen by Arizona consumers. The implications of their study suggest that portraying an accurate message about agriculture is essential for the future of the country. Future generations of agriculturists will be faced with difficult ethical agricultural issues and will need to be prepared to deal with solving those problems.

Dewey and Tuft's *Ethics* (1932) describes ethics as a science that deals with conduct. In their discussion on attempts at solving moral problems, Dewey writes about the scientific attempt to establish "an order of judgments such that each one when made is of use in determining other judgments thereby securing control of their formation." (cited by Campbell, 1995). The art and science of problem solving has long been a focal point and instructional technique area for many agricultural education departments across the country. McCormick describes problem solving as building teaching upon real life problems and then actively involving students in seeking intelligent answers to these problems. This process is designed to teach students how to think, how to reason and how to make decisions (McCormick, 1994).

Need for the Study

The limited availability of pedagogical tools to educators was exposed through a Current Research Information System (CRIS) search done for this study. The search revealed only one study relating to ethics and agricultural education over the past ten years. An expanded search under the topic of ethics and agriculture revealed 38 broader based studies; from which only two continued

through to the development of educational materials for secondary schools. This would suggest limited work done to develop pedagogical tools for the classroom. In order to better prepare future generations of agriculturists, teachers must be equipped with curriculum and materials to address this challenge. Identifying critical ethical agricultural issues would appear to be the first step in addressing this need.

Due to the nature of society, many people are so removed from production agriculture they have forgotten the true importance of its contribution to humankind. "Most Americans know very little about agriculture, its social and economic significance in the United States, and particularly, its links to human health and environmental quality." (National Research Council, 1988). Agricultural educators in the public schools are the logical professionals to prepare young people for communicating agricultural information to our ever-changing society.

FRAMEWORK

The operational framework of this study allowed for the evolvement of the original issues cited in the Olsen and Elliot (1995) study to serve as a foundation source for the discovery of a new list of issues based on teacher and curriculum needs. Olsen and Elliot's (1995) acknowledgement of and findings within the rapidly changing social environment of agriculture in one of the western states was a logical starting point for the questionnaire used in this study. Using a true Delphi, Olsen and Elliot obtained a list of the twenty prevalent Arizona consumer issues relating to agriculture and the environment. These issues were prioritized in order of importance by a consensus of the respondents. Since issues such as public land use and water use control are unique to the western states, the final ten issues identified by the Olsen and Elliot study seemed a logical point to begin when taking a large scale look at ethical agricultural issues in the western states.

The framework of this study indicated the beginning of the Delphi modification by starting with ten existing issues as illustrated in Figure 1. These issues were then opened to the identified teachers for discussion and revision. The process eventually led to the surfacing of three key areas. This number was selected based on financial limitations in the curriculum development phase.

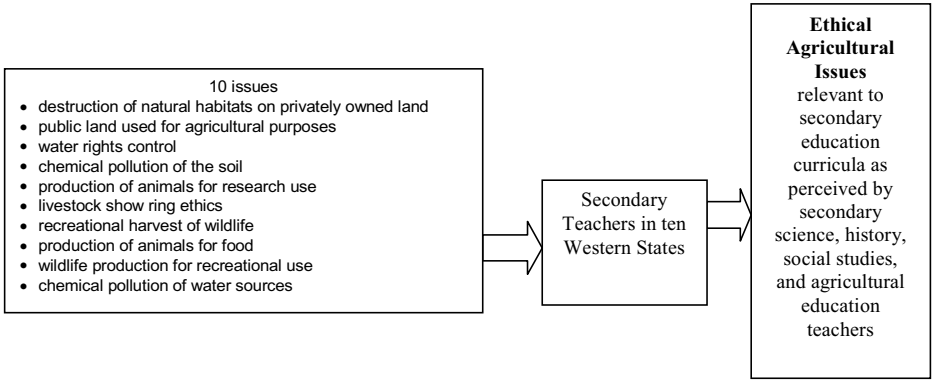

Figure 1. Operational Framework: begins with the ten issues cited in the Olsen and Elliot (1995) study and allows teachers to determine which issues are most relevant to secondary education.

Purpose and Objectives

This study was designed to identify current ethical agricultural issues to be addressed by both agricultural and general education classes. It was designed to determine which ethical agricultural areas are most critical as perceived by educators. The primary purpose of this study was to determine which ethical agricultural areas are perceived by secondary teachers to be most critical to the general consuming public and, therefore, students of agriculture. This study was limited to ten western states.

The objectives of this study were met by:

1. Determining if secondary teachers of agriculture, science, history, and social studies addressed ethical agricultural issues in their classes.
2. Identifying the three most important areas of ethical agricultural issues relevant to consumers as perceived by secondary school teachers in the areas of agricultural education, science, history and social studies from Arizona, California, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming.
3. Identifying the three most important areas of ethical agricultural issues relevant to the curricula of selected secondary school teachers, identified in this study, as perceived by those same teachers.

Methods and Procedures

The Delphi is a group process technique used to elicit, collate and generally direct informed judgment toward consensus on a particular topic. The typical Delphi utilizes four stages to reach consensus including these steps: 1) identify the issues; 2) determine the importance of the issues; 3) determine level of agreement on each issue statement; 4) confirm level of agreement (cited by Elliot and Dado, 1992). In attempting to elicit a consensus of opinion regarding ethical agricultural issues among teachers, the researcher chose a modified Delphi approach to this study. Initially, the expected return time for the first mailing was extended to allow the agricultural education teachers to identify the remaining secondary teachers to be contacted at their respective schools. In addition, limited debate among the participants was designed into the questionnaires. Although comments were encouraged, participants were asked to rank items and agree on group rankings. Opinions from four groups of educational professionals (agricultural education, science, history and social studies) were gathered to determine the stated objectives. It should be noted that because of the variation among schools in offering history or social studies, both groups were included. The agricultural education teachers were selected randomly. However, the science, history and social studies teachers were brought into the study through recommendations from the agricultural education teachers.

According to Delbecqu, van de Ven, and Gustafson (1975) respondents should be considered who: 1) have special experience or knowledge to share; 2) represent a cross-section of opinions; and 3) can be motivated to participate. The Delbecqu literature also notes that, in their experience, 30 well-chosen respondents provide sufficient information for a Delphi study, with few additional ideas being generated by having more participants. Delbecqu further states that 15 percent of the selected participants should be expected to decline. It was estimated the initial sample would provide an excess of the minimum respondents suggested by Delbecqu. Even though it was not required, a stratified proportional sample was used to obtain a broad perspective on the issue.

A stratified proportional sample (based upon relative teacher populations of each state) of certified secondary school teachers in the areas of agricultural education, science, history and social studies

was selected from ten western states. Due to the wide variation in numbers of teachers in each state identified, the investigator realized a stratified proportional sample would provide a more accurate picture of the region identified.

The first round was actually a two-part mailing. The randomly selected agricultural education teachers were sent the questionnaire and also asked to identify a science, history and social studies teacher from their respective schools. When completed questionnaires were received, identical questionnaires were sent to the science, history and social studies teachers identified by the agricultural education group.

In order to utilize the most current listing of agricultural education teachers in the identified states, the researcher contacted state supervisors for agricultural education in each state. The supervisors provided their most current directory for teachers in their respective states. Secondary schools offering agricultural education in the selected states totaled 1,030. Two hundred eighty-seven schools were selected. The first mailing (made to agricultural education teachers) included the first questionnaire and a request to identify one science teacher, one history teacher and one social studies teacher at their secondary school.

Following the identification of the sample population, an initial instrument was developed. The original list of issues was borrowed from the Olsen and Elliot study, entitled: "Identifying Arizona Consumer Agricultural and Environmental Issues". Content validity was determined through a panel of experts including agricultural education faculty and graduate students from various educational fields. The first questionnaire was mailed to selected participants. In this round, subjects were asked if ethical agricultural issues were addressed in their classes. They were also asked if any other types of ethical issues were addressed in their classes. Then, participants were asked to rank a group of ten issues according to their importance to the curriculum used in the classroom. The ten issues listed in the first questionnaire were identified in a study by Olsen and Elliot (1995). Additionally, they were asked to rank the same ten issues according to their importance to themselves as consumers, not educators. This dual ranking process was designed to determine if topics discussed in class were selected based on curriculum demands, as relevant to the local community, or simply because of personal interest on the part of the teacher. An open-ended section was included to reveal any concerns not listed in the group of ten issues. Reliability was not determined as the questionnaires were developed using simple ranking formats.

During the second round of the study, subjects were provided with the group consensus order of importance of the ten topics presented in round one. This order was determined by ranking according to majority selections. This list was extended to include three additional topics identified by the participants as relevant in round one. Relevant topics were selected according to the topics listed most often. Only three areas were repeatedly listed. Various other topics were identified, but listed only one time each. Subjects were then asked to identify in order of importance the top six topics from the list of thirteen topics compiled from the original ten plus the three identified additions. Subjects were also provided an open-ended section in which to list arguments on behalf of their selected six topics.

Round three provided the three top ranked issues. Representative justification statements were also provided for each issue. Subjects were asked to agree or disagree with the rankings. Participants were also encouraged to include any comments regarding the final selection of issues. Although these comments would have no bearing on the current study, they were solicited for use in future projects.

Follow-up phone calls were made seven to ten days after each round of the mailings. Second copies of the questionnaires were faxed or mailed to those individuals requesting them.

FINDINGS

As shown in Table 1, of the original group of 287 agricultural education teachers surveyed 46.3 percent returned their round one questionnaires. Due to the fact that some of the responding agricultural education teachers identified less than three additional teachers in the areas of science, history and social studies, the total number of subjects surveyed in round one was 410. Of this total 197 teachers returned their questionnaires.

Round two began with 197 questionnaires mailed to the previous respondents. A total of 109 were returned for a return rate of 54 percent. One-hundred and nine questionnaires were mailed in the final round. Seventy-five were returned. This represented 68.8 percent return, of the questionnaires mailed, for the final round. Additionally, this recognized that seventy-five (75) participants continued responding throughout the entire study. Sixty-one and one-half percent (61.5) of the completers (participants in all three rounds) were agricultural education teachers. Where n = 109, sixteen and nine-tenths percent (16.9) of the respondents were science teachers, just over six and two-tenths percent (6.2) were history teachers, and fifteen and four-tenths percent (15.4) were social studies teachers. It should be noted that although the return rate was not what the researcher had hoped for, the respondents of the selected population that were completers exceeded the minimum required according to Delbecque (1975). In addition, when comparing early and late respondents the type of teachers responding reflected similar percentages. Sixty-eight percent of the early respondents were agricultural education teachers with the remaining thirty-two percent of the respondents being mixed between the other teacher categories. In the final round of the study, sixty-two percent of the respondents were agricultural education teachers compared to thirty-eight percent of the remaining categories. According to Miller and Smith (1983), such similarities would indicate similar responses would have been indicated from any non-responding subjects.

Table 1
Respondents by Category

	Agricultural Education Teachers		Science Teachers		Social Studies Teachers		History Teachers		Total Respondents for Round	
Group	n	%	n	%	n	%	n	%	n	%
Round one respondents	133*	68% (46.3%)	20	10	22	11	22	11	197	100
Round two respondents	72	66	11	10	15	14	11	10	109	100
Round three respondents	39	62	10	16	11	17	3	5	75	100

Note: The agricultural education teachers received their round one survey along with a request to identify teachers in the other three areas to be used in the study. The percentage in parenthesis reflects the return of that portion of round one.

The data gleaned from the returned questionnaires was processed by using the Statistical Package for the Social Sciences SPSS 6.1 for Windows version. The yes/no questions were analyzed using descriptive statistics. The lists of issues were analyzed and ranked using tables of frequencies. Finally, the open-ended questions were analyzed using comparative listing techniques.

Stage One

Questionnaire number one provided a listing of ten topical issues identified (Olsen and Elliot, 1995), as prevalent concerns to the general consuming public. This questionnaire also contained two yes or no questions and an open-ended section to allow for identification of issues not previously identified. The yes or no questions asked if the subjects addressed ethical issues in class and if they addressed ethical agricultural issues in class. As the data in Table 2 suggests, almost all teachers replied that they address ethics, and specifically ethical agricultural issues, in their classrooms.

Table 2
Are Ethical Issues Addressed in Class?

	Address ethics in class		Address ethical agricultural issues in class	
	n	%	n	%
Yes	192	98.5	183	92.9
No	3	1.5	14	7.1

Table 3 depicts the rankings of ten identified issues according to their relevance to the individual as a consumer and their relevance to the individual's classroom curriculum. Note that the rankings are similar with most differences being only a one or two level ranking change.

Table 3
Ranking of Ten Ethical Agricultural Issues

Rank as relevant to you as a consumer		Rank as relevant to your classroom	
Rank	Issue	Rank	Issue
1	Chemical pollution of water sources	1	Chemical pollution of water sources
2	Chemical pollution of the soil	2	Chemical pollution of the soil
3	Water rights control	3	Production of animals for food
4	Public land used for agricultural purposes	4	Water rights control
5	Production of animals for research use	5	Public land used for agricultural purposes
6	Destruction of natural habitats on privately owned agricultural land	6	Destruction of natural habitat on privately owned agricultural land
7	Recreational harvest of wildlife	7	Production of animals for research use
8	Production of animals for food	8	Livestock show ring ethics
9	Wildlife production for recreational use	9	Recreational
10	Livestock show ring ethics	10	Wildlife production for recreational use

Additionally, round one included an open-ended section requesting identification of issues not addressed. Three topics emerged from this section, including: Right to farm—conversion of agricultural land to urban development; Government land use regulations- grazing rights; Biotechnology—the genetic altering of plant and animal tissue.

Stage Two

Questionnaire number two asked participants to rank the top six issues from the combined original list of 10 and the three additional topics in round one. This reducing process was intended to help participants identify the top three issues relevant to Objective two. Again, respondents were asked to select their choices based on their relevance to them as consumers and to their classroom curriculum.

Table 4 shows the results of these rankings. From this selection only two items conflict in the top six areas for both consumer and curriculum. The *Production of animals for food* and *Public land used for agricultural purposes* were the two areas that were different.

Table 4
Ranking of Top Six Ethical Agricultural Issues

Rank as relevant to you as a consumer		Rank as relevant to your classroom	
Rank	Issue	Rank	Issue
1	Right to Farm–conversion of agricultural land to urban development	1	Water rights control
2	Water rights control	2	Chemical pollution of water sources
3	Public land used for agricultural purposes	3	Right to Farm–conversion of agricultural land to urban development
4	Government land use regulations–grazing rights	4	Chemical pollution of soil
5	Chemical pollution of water sources	5	Government land use regulations–grazing rights
6	Chemical pollution of the soil	6	Production of animals for food

Stage Three

The final round of the study presented participants with the top three issues in each area of concern (consumer and curriculum), as determined by group rankings. They were also given representative justification comments made about the top three areas. Subjects were asked to agree or disagree with the ranking of the selected issues. Participants were also encouraged to make comments on any of the selected issues that they did not feel were relevant. No outside comments were made. In both areas of relevance, consumer and curriculum, all three of the selected issues were approved. All selected issues received consensus approval. Table 5. shows the results for each issue.

Two of the three most relevant issues facing agriculturists from both the consumer viewpoint and the curriculum viewpoint were the same. *Water Rights Control* and *Right to Farm* were considered important when participants considered both areas of relevance. In addition, from a consumer standpoint participants found *Public land used for agricultural purposes* to be important. However, when considering the issues from a classroom curriculum view, participants added *Chemical Water Pollution* as the third relevant issue. These findings suggest that both land use and public water sources were areas of concern for the subjects both as consumers and as educators. Although limited in numbers, the responses from participants in the areas of science, history and social studies suggest that these issues would be equally at home in either the agricultural education classroom, or a more traditionally academic classroom, such as science, history or social studies.

Table 5
Acceptance of Consensus Issues

	Relevance to you as a consumer[a]		
	Right to Farm–conversion of agricultural land to urban development	Water rights Control	Public land used for agricultural purposes
Agree	90.8 %	96.9%	90.8 %
Disagree	9.2 %	3.1 %	6.2 %
No comment	0	0	3.1 %

	Relevance to your class curriculum[b]		
	Water rights control	Chemical water pollution	Right to Farm–conversion of agricultural land to urban development
Agree	95.4 %	98.5 %	90.6 %
Disagree	3.1 %	1.5 %	9.4 %
No comment	1.5 %	0	0

Note. [a]Responses when asked relevance as a consumer
[b]Responses when asked relevance to class curriculum

Conclusions and Recommendations

Nearly all of the self-selected teachers completing the survey process reported addressing ethical issues in class. Although teachers in this study, as consumers, were very interested in the areas of ethical agricultural issues regarding land use and water sources, their personal views may not be reflected in what they perceived to be relevant to the classroom. Due to the diversity of the western states and the knowledge that certain issues are unique to those states, similar studies should be conducted to determine issues relevant to other regions. Limited availability of information regarding ethical agricultural issues in secondary schools would suggest that this study, or similar ones, should be replicated in other regions of the country. Continued surveying of educators on a routine basis could provide lists of accessible curricula and identify curriculum needs of classroom teachers with regard to ethical agricultural issues.

Implications

As all people inhabit the same planet, this study has shown that representatives of different educational groups share many of the same concerns. Students, as well as leaders of tomorrow will face many of the same problems. John Dewey maintained that we need to see our problematic lives as requiring a series of important choices that will benefit from scientific attempts to turn them into legitimate judgments (Campbell, 1995). Certainly, if not all ethical agricultural issues concerning agriculture are relevant to the classroom, those identified here should be addressed by teachers in the western states allowing students to view all sides of the issues and practice problem solving. This study has provided a point for educators in the western states to begin addressing the ethical agricultural issues facing students today and leaders of tomorrow.

REFERENCES

American Farm Bureau (1997). *Farm Facts*. American Farm Bureau Federation

Baer, Jr., R. E. and Eldridge, M. (1985). Agricultural ethics at state universities: Why no input from theologians? *Agriculture and human values*, 2 (4), 44-46.

Blatz, C. V. (1991). *Ethics and agriculture: An anthology on current issues in world context*. C. V. Blatz (Ed.), (p. 1). Moscow: University of Idaho Press.

Bundy, Stephen McG. (1995). Ethics education in the first year: an experiment. *Law and Contemporary Problems, 58,* 19-35.

Campbell, James (1995). *Understanding John Dewey*. Open Court Publishing, Carus Publishing Company, Peru, Illinois.

Committee on Agricultural Education in Secondary Schools (1988), *Understanding Agriculture: New Directions for Education*, National Research Council, National Academy Press, Washington, D. C.

Delbecqu, Andre; van de Ven, Andrew; and Gustafson, David. (1975) *Group techniques for program planning: A guide to Nominal Group and Delphi*. Chicago: Scott Foresman.

Doering III, O. C. (1992). The social and ethical context of agriculture: Is it there and can we teach it? Karl G. Brandt (Chair), *Proceedings of the Board on Agriculture National Research Council, Agriculture and the undergraduate*. (pp. 237-242). Washington, D. C. : National Academy Press.

Elliot, J. & Dado, G. (1992). *Michigan agricultural issues: A Delphi study for the Michigan State University Agricultural Experiment Station*. East Lansing: Michigan State University.

Friedman, Marilyn (1995). Multicultural education and feminist ethics. (Special issue: Feminist Ethics and Social Policy, part 2). *Hypatia, 10*(2).

Goodwin, J. (1994). *A question of ethics: Why some people should and why some people should not be involved with junior livestock projects.* Symposium about the issues affecting agriculture and the junior livestock program, Oklahoma City, Oklahoma.

Gore, Al (1993). *Earth in the balance: Ecology and the human spirit*. Penguin Books USA Inc., New York, New York.

Johnson, G. L. and Bonnen, J. T. (1993). *Economics of agricultural development and change*. (Michigan State University, 1993). CRIS 9009287.

Krejcie, R. V., and Morgan, D. W. (1970). *Educational and psychological measurement*, 30, 607-610.

McCormick, F. G., Jr. (1994). *The power of positive teaching*. (pp. 185-195). Krieger Publishing Company, Malabar, Florida.

McEwen, F. L. and Milligan, L. P. (1992). An analysis of the Canadian research and development system for agriculture/food. *Journal of agricultural and environmental ethics*. 5 (1), 107-109.

McMillan, K. (1990, March). A rat is a pig is a boy. *Beef Today*, 18-22.

Meeks, Douglas (1985). God and land. *Agricultural and human values*, II (4), 16.

Miller, L. E. & Smith, K. L. (1983). Handling non-response issues. *Journal of Extension Education*, XXI, September/October.

Olsen, James L. and Elliot, Jack (1995). Identifying Arizona consumer agricultural and environmental issues. Proceedings from the 14th *Annual Western Region Agricultural Education Research Meeting, 22*. Denver, Colorado.

Pickard, Willis (1995). To point down the road to ethics. *Values Education*, (Times educational supplement), 23.

Ruehr, T. A., Hartel, P. G., George, K. P., and Vorst, J. (1992). Teaching agricultural ethics. *Agricultural ethics: Issues for the 21st century*. Proceedings of a symposium sponsored by the Soil Science Society of America, American Society of Agronomy and the Crop Science Society of America. Minneapolis, Minnesota.

Stevens, Robert L. and Allen, Michael O. (1996). Teaching public values: three instructional approaches. *Social Education, 60,* 155.

Tuckman, B. W. (1988). *Conducting Educational Research*. 3rd Edition. San Diego California. Harcourt, Brace, Jovanovich Publishers.

Williams, D. L. (1994). *Natural resources and conservation education programs*. (Iowa State University, 1994.) CRIS 9133123.

Williamson, Bob (1996). Medical ethics, teaching and the new genetics. (Editorial) *Journal of Medical Ethics, 22*, 325.