

Writing Across the Curriculum: Where Does Horticultural Science Fit In?

**Karina Zambreno; Emily Hoover;
Neil Anderson; &
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*A research grant report submitted to the Center for
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Preface

The Center for Interdisciplinary Studies of Writing offers research grants that have the potential to contribute knowledge about academic literacy in six areas: (1) curricular reform through writing-intensive instruction, (2) characteristics of writing across the curriculum, (3) connections between writing and learning in all fields, (4) characteristics of writing beyond the academy, (5) effects of ethnicity, class, and gender on writing, and (6) the status of writing ability during the college years.

In 2001 the Center for Interdisciplinary Studies of Writing awarded Dr. Emily Hoover, Dr. Neil Anderson, and Dr. Jeffrey Gillman a grant for a project entitled “Writing Across the Curriculum: Where Does Horticultural Science Fit in? Karina Zambreno, the graduate research assistant from the Department of Horticultural Science at the University of Minnesota, carried out the project. Their research funded by the Center because of its focus on curricular reform through writing-intensive instruction. The study included interview with 13 teaching faculty and results were categorized and analyzed based on the answer faculty responded for each question during the interview.

Professor Hoover is a Morse-Alumni Distinguished Teaching Professor of Horticulture and received her Ph.D. in Horticulture from the University of Minnesota in 1982. Dr. Hoover teaches undergraduate and graduate courses in general biology, plant propagation, fruit production, and teaching techniques and she is the Director of Education at the Landscape Arboretum. Her research has focused primarily on evaluation of winter hardiness and winter protection/adaptation to enhance profitability, efficiency, and sustainability of fruit cropping systems. Areas of emphasis include using apple rootstocks to increase efficiency of apple cropping systems, utilizing grape root stocks to

improve winter survival, and weed control strategies for strawberry cropping systems. Integrated pest management systems (IPM) for apples and berry crops are being adapted from models developed in eastern states.

Dr. Anderson is a floriculture breeder/geneticist who directs the herbaceous perennial breeding program at the University of Minnesota. He received his Ph.D. from the University of Minnesota in 1989. He has recent experience in the commercial flower seed industry as a flower breeder, potted plant production manager, and new crop specialist. His research program focuses on winter hardiness, re-flowering (day neutrality), and invasiveness of herbaceous perennials. Dr. Anderson directs a new center at the University of Minnesota devoted to studying invasive species: The Invasion Biology Research Consortium (IBRC). IBRC is a “think-tank” of associated faculty and their research labs from three campuses and three colleges. Dr. Anderson also coordinates the annual bedding plant trials for the St. Paul campus. He also conducts winter hardiness testing of new herbaceous perennials at five trial sites in Minnesota (Z3, Z3/4, Z4).

Professor Jeffrey Gillman received his Ph.D. in Horticulture from the University of Georgia in 1998. He is interested in the production and ecology of woody landscape plants. Some of his specific interests include propagation of difficult to root plants, efficient fertilizer and water usage, and the effects of chemicals on intercropping systems. Other interests include using the Internet to teach and to disseminate nursery information. The nursery program at the University of Minnesota includes one of the best teaching facilities of its type in the United States.

We believe that their study will provide valuable new insights for faculty and researchers in the field of Horticulture Science. We invite you to contact the Center about

this publication or any others in the series. We also appreciate your comments on our publications.

Lillian Bridwell-Bowles, Series Editor
Mesut Akdere, Editor
June 2002

Abstract

In Fall 1999, the University of Minnesota implemented a Writing-Intensive requirement for undergraduates. As part of the requirement, students must take one upper division Writing-Intensive course in their major. The Department of Horticultural Science offers an Environmental Horticulture major which currently has only one Writing-Intensive course in its entire curriculum. Teaching faculty was interviewed and syllabi were reviewed to gather information on what types of writing are currently being assigned and to discuss where more Writing-Intensive courses should be placed in the Environmental Horticulture curriculum in the future. These surveys and interviews revealed that the majority of classes assign formal writing and that the majority of the faculty review or are willing to review a draft of an assignment, two key components of the Writing-Intensive requirement. Informal writing assignments are less common, indicating a deficient area of the curriculum. With slight modifications, many classes in the Environmental Horticulture curriculum can meet the requirements to become designated as Writing-Intensive. Faculty agreed that Writing-Intensive courses should be placed in upper-level, smaller classes that place less emphasis on production techniques or plant identification.

Background

Writing across the curriculum has been implemented in universities and colleges in an effort to improve writing skills and encourage more thoughtful exploration of course content (Herrington, 1981). In practice, writing across the curriculum means that Writing-Intensive classes are offered in all departments and not limited to Composition and Rhetoric classes. Writing-Intensive classes are designed to integrate writing into the course objectives so that course content is learned in part through the process of writing (Herrington, 1981).

The University of Minnesota (UMN) has implemented a Writing-Intensive requirement for undergraduates entering after Fall 1999. The specific goals of the Writing-Intensive program are to teach students to write for a variety of audiences, learn different kinds of writing styles, and prepare students to communicate effectively in their field of study and future careers (The Center for Interdisciplinary Studies of Writing, 2000).

In order for a class to be designated as Writing-Intensive, faculty at UMN submit a proposal along with a course syllabus that clearly indicates how writing serves the goals of the course. The main requirement is 10 to 15 pages of formal writing assignments with at least one stage of an assignment involving a critical review of a draft by the professor or a teaching assistant (The Center for Interdisciplinary Studies of Writing, 2000).

Without an opportunity for revision, instructor comments have little effect on improving subsequent papers (University Writing Program at Virginia Tech, 1998). Allowing for revision continues the writing process and allows students to learn from their mistakes (Dohrer, 1991). Including peer reviews in the process has added benefits.

Students feel empowered by becoming part of the review process and believe giving and receiving comments from peers enables them to become better writers (Koprowski, 1997). In addition, Koprowski (1997) found that peer reviews resulted in significantly improved papers when compared to revisions after review by the instructor alone.

Writing-Intensive courses at the University of Minnesota are also advised to incorporate informal writing assignments throughout the semester. These may include journal entries and brief responses to workbook questions or field trips. Informal writing gives students the opportunity to write out their thoughts on a particular subject without worrying about formatting (Madigan, 1987). If informal writing is used to explore a certain topic, there is also the possibility for early intervention by the instructor if a concept is not being understood (Madigan, 1987).

To fulfill the Writing-Intensive requirement at the University of Minnesota, undergraduate students are required to take four Writing-Intensive courses with at least one being an upper division course in their major (The Center for Interdisciplinary Studies of Writing, 2000). This particular requirement is designed to meet the goal of teaching students to communicate in their fields of study. For example, students studying science are often placed in courses where the focus lies more on learning content than learning writing skills for the discipline (Krest and Carle, 1999). Furthermore, it is difficult, if not impossible, for English and Rhetoric departments to teach all of the different thought processes and styles used to write in the wide range of disciplines found at a university (Madigan, 1987). By integrating writing into science classes, the specific skills required to write in that discipline can be taught by a professional in the field and done in stages as writing assignments become more complex (Krest and Carle, 1999).

The Department of Horticultural Science at the University of Minnesota offers an Environmental Horticulture major for undergraduates. Within the Department, students take professional requirement courses and a series of courses based on their area of emphasis (Table 1). Currently there is only one Writing-Intensive course in the Environmental Horticulture curriculum, a Nursery Production and Garden Center Management course. Offering only one writing intensive course makes it impossible for students in other areas of emphasis to easily fulfill the Writing-Intensive requirement. There is a strong need, therefore, for more Writing-Intensive courses in the curriculum. A grant from the Center for Interdisciplinary Studies of Writing at the University of Minnesota enabled an exploration of the current state of writing in the department. The purpose of this study was to characterize current writing assignments and to collect information for further discussions on the role of Writing-Intensive courses within the Environmental Horticulture curriculum.

Materials and Methods

Interviews were conducted with 13 of the 14 current teaching faculty in the Department of Horticultural Science teaching a total of 21 classes in the Environmental Horticulture curriculum. Prior to each interview, copies of syllabi for all classes taught by the faculty member were collected to calculate the percentage at which course grades were based on writing. During the interview, writing assignments for each class were characterized by type and length. Faculty was also asked about the procedure they currently use for responding to preliminary drafts. Those who currently do not comment on drafts were asked about their willingness to implement this aspect of the Writing-Intensive guidelines in the future.

The last part of the interview consisted of gathering opinions on how writing is currently used in the Environmental Horticulture undergraduate curriculum. Faculty was asked specifically where Writing-Intensive courses should be placed in the curriculum. They were also asked if they thought there was sufficient writing in the curriculum. They could answer “Yes,” “No,” or “I don’t know.” When the answer was “No” or “I don’t know,” additional comments about perceived weaknesses and recommendations for ways in which writing assignments should change were also recorded. Other topics discussed included the quality of student’s writing, usefulness of critical reviews of drafts, and concerns about grading writing assignments.

After all of the interviews had been completed, the information gathered on the writing assignments was categorized into discrete units of formal and informal writing. Formal types of writing were separated into primary and secondary research while informal writing was left as its own category and not subdivided. Primary research was defined as assignments based on original data gathered by the student and presented in the form of a lab report or design project. Secondary research was gathered from outside sources such as journal articles, trade publications, books and the internet and was presented in forms such as literature reviews or informative reports on a specific topic. To determine how these types of writing assignments were utilized, the number of the types of assignments used in each class was determined.

Results from the questions regarding the presence of sufficient writing in the curriculum were summarized as percentages of the total number of faculty interviewed (Table 2, Question 1). Results from questions regarding the different types of writing assignments used in each class were treated in two ways. First, the number of classes

assigning a particular type of assignment was calculated (Table 2, Question 2). Second, the classes were further characterized by how many and what types of writing they assigned (Table 2, Question 3). Results from questions about the percentage of course grades based on writing were divided into four categories (<25%; 26-50%; 51-75%; >75%). The percentage of classes falling in each category was then calculated (Table 2, Question 4).

Results

There was a fairly even split when faculty were asked if there was sufficient writing in the current curriculum (Table 2, Question 1). Four of the faculty felt that there was not enough while five felt that there was already enough writing. The remaining four either did not know how writing was being used across the curriculum or if the amount of writing was sufficient.

When characterizing how the primary research, secondary research and informal writing were utilized by the presence or absence of a particular type of writing in a class, the greatest numbers of classes assigned a secondary research project and the majority of classes assigned a primary research project (Table 2, Question 2). Less than one-third of the classes utilized informal writing. When looking at how the types of writing were combined within a class, almost half used only primary or secondary research for all writing assignments (Table 2, Question 3). None of the classes used only informal writing. About one quarter of the classes integrated all three types of writing into their assignments and one class used secondary research and informal writing. Half of the classes required formal writing assignments (primary or secondary research) that totaled

at least 10 pages and half of the instructors reviewed a rough draft of part or all of an assignment (data not shown).

Almost half of the classes in the curriculum had between 26 and 50% of their grade based on writing (Table 2, Question 4). Seven of the 21 classes based the majority of student grades on writing.

Discussion

Results of these interviews indicate that although only one class in the Environmental Horticulture curriculum is classified as Writing-Intensive, many of the classes already meet the requirements to become a Writing-Intensive course or could meet the criteria with slight modifications of writing assignments and/or syllabi. The majority of courses include formal writing assignments that involve primary or secondary research and, based on review of syllabi and the interviews, assignment lengths are often within the 10 to 15-page range required by the University's Council on Liberal Education (CLE).

The lack of informal writing in the majority of classes illustrates a deficient area in the curriculum. It may be beneficial to provide faculty members with examples of how informal writing is used in Horticultural Science classes at other universities to help them incorporate this type of writing into their classes. Informal writing helps students learn course content by encouraging active thought and synthesis of knowledge (Moore, 1994). Informal writing activities can benefit both the students and the teacher by stimulating discussion during lecture, clarifying key points and allowing exploration of new ideas in a less threatening way than through formal assignments (Moore, 1994).

Faculty who review drafts as part of the writing process noticed a marked improvement in the quality of writing on assignments, but believe it takes more time than they often have to give to do a quality review. Research has shown, however, that students can catch the majority of their own errors if only representative errors are marked on a draft, reducing the amount of time required by instructors to review a paper (University Writing Program at Virginia Tech, 1998). In addition, too many marks can overwhelm students and shift the focus of revision away from content to surface changes (Dohrer, 1991).

One misconception about the requirement of the critical review process in Writing-Intensive courses revealed in these interviews was the amount of writing that must be reviewed. According to CLE's Writing-Intensive requirements at the University of Minnesota, one formal writing assignment needs to be reviewed. Because the 10 to 15-page minimum can be met by several assignments rather than one long assignment, faculty can arrange to review drafts of shorter assignments. Separating a formal writing assignment into a series of progressively complex papers has been found to be a more effective way to teach writing and content because it allows students to build their content knowledge and writing skills as the assignments progress (Herrington, 1981). Another benefit is that a critical review of a draft of one of the earlier papers allows for intervention if a concept is not understood before the assignments becomes more complex and a larger percentage of the student's grade is at stake (Department of Cultural Studies and Comparative Literature, 1997).

Comments from faculty on their students' ability to write indicated their impression that students come to college as poor writers and Rhetoric classes taken once

in college do not teach students how to write competently in science. This reaffirms the position of the University of Minnesota that the teaching of writing must be shared across the curriculum in order for students to become proficient writers in their fields (The Center for Interdisciplinary Studies of Writing, 2000). The faculty interviewed shared similar views on where Writing-Intensive classes should be placed in the curriculum. The 1000-level classes taken as part of the professional requirements are heavily based on laboratory experience, production techniques and plant identification. A large amount of hands-on time is spent in these classes to learn the objectives of the course and the majority of faculty felt that there are many other classes in the curriculum where the Writing-Intensive designation would be a better fit. The consensus was that at least one Writing-Intensive course should be placed in all of the areas of emphasis for the Environmental Horticulture degree requirements. These are upper level classes that have fewer students, allowing for more in-depth exploration of topics in horticulture.

As a result of this grant, the Department of Horticultural Science has begun to think about Writing-Intensive guidelines. By discussing the results of this study with the teaching faculty and addressing concerns raised during the interviews in the future, the dialogue about where and how Writing-Intensive courses will fit into the curriculum can continue. The lack of informal writing in the curriculum will also need to be addressed as part of the discussion since this type of writing is an integral part of the Writing-Intensive classes.

Through the interviews, faculty members have been shown that many of their classes are close to meeting University of Minnesota requirements. The next step will be to increase the numbers of Writing-Intensive classes to include all areas of emphasis in

the Environmental Horticulture major. As the number of Writing-Intensive classes increases, it will be important to continue to work with the faculty on strategies to effectively deal with the perceived increase in grading.

The Environmental Horticulture curriculum is giving students many opportunities to learn through writing. Formal writing assigned in the majority of classes allows students to explore their own research or other topics related to the course material in depth. When classes assign informal writing assignments, students learn course material through weekly journals or reflection papers. With minor modifications to the current curriculum to include more informal writing and review of drafts of formal writing assignments, writing can become an even more effective learning tool for undergraduates majoring in Environmental Horticulture.

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Table 1. Required classes and number of credits for Environmental Horticulture majors offered through the Department of Horticultural Science at the University of Minnesota. All students must take the Professional Requirements and choose one area of emphasis for the remaining credits. Introductory classes are designated by 1000 and upper-level classes are designated by 3000 or 5000. The one Writing-Intensive class in the curriculum is marked with an asterisk (*).

Professional Requirements

Hort 1001	Plant Propagation (4)
Hort 1011	Herbaceous Landscape Plants (4)
Hort 1012	Woody Landscape Plants (4)
Hort 3002	Greenhouse Management (3)
Hort 3005	Environmental Effects on Horticultural Crops (2)
Hort 4096	Professional Experience Program (3)
Hort 4401	Plant Genetics and Breeding (4)

Areas of Emphasis:

Landscape Design, Implementation and Management

Hort 4021	Landscape Design, Implementation and Management I (4)
Hort 5021	Landscape Design, Implementation and Management II (4)
Hort 5024	Landscape Development (1)

Hort 4061 Turf and Landscape Management (4)

Two additional elective courses from a list

Nursery Production and Garden Center Management

Hort 4041 Nursery Production and Management I (4)*

Hort 5041 Nursery Production and Management II (3)

Hort 5042 Nursery Operations (1)

Two additional elective courses from a list

Greenhouse Production and Retail Floriculture

Hort 4051 Potted Plant Production (4)

Hort 5051 Bedding Plant Production (4)

Hort 5052 Cut Flower Production (4)

Two additional elective courses from a list

Turfgrass Management

Hort 4021 Landscape Design, Implementation and Management I (4)

Hort 4061 Turfgrass and Landscape Management (4)

Hort 5061 Turfgrass Science (3)

Two additional elective courses from a list

Table 2. Survey results of 13 Department of Horticultural Science teaching faculty on the presence of writing in the Environmental Horticulture, the types of writing assignments and percent of grade based on writing in the 21 classes.

1. Is there sufficient writing in the current curriculum (n=13)?

Yes	31%
No	38%
Don't know	31%

2. What percentage of the classes assigns each of the three writing types (n=21)?

Primary research	57%
Secondary research	71%
Informal writing	29%

3. How do the classes utilize the three writing types (n=21)?

No writing assignments	9%
Primary research only	19%
Secondary research only	29%
Informal writing only	0%
Primary and secondary research	14%
Secondary research and informal writing	5%

Primary research and informal writing	0%
Primary, secondary and informal writing	24%

4. What percentage of the grade is based on writing in the classes (n=21)?

< 25%	19%
26-50%	48%
51-75%	24%
> 75%	9%
