FUTURE DIRECTIONS FOR INTERDISCIPLINARY EFFECTIVENESS IN HIGHER EDUCATION
A Delphi Study

by
James Welch IV

University of Texas at Arlington
Department of Interdisciplinary Studies

Abstract: This article discusses the findings of an empirical interdisciplinary research project the researcher conducted as the exit module for the completion of a Master of Arts degree in Interdisciplinary Studies at Texas State University. It is the culmination of a year and a half study which applied scientific research methods to establish key ideas on the future development of interdisciplinary studies programs. Specifically, the study addressed the question, "What changes in interdisciplinary studies programs need to take place over the next decade in order to better serve the needs of students whose academic goals are not adequately addressed by traditional discipline-based programs?" The study explored five areas of inquiry: curriculum, teaching, faculty development, administration, and program delivery. Each area of inquiry produced consensus on several ideas. This paper reports the results of the study and discusses its implications.

Impetus for Research

Many writers in the field of interdisciplinary studies complain of a general vagueness, or at least multiplicity of definition, in the term "interdisciplinarity." Nevertheless, Newbould (1975) defines interdisciplinarity as:

> The *interaction* among two or more different disciplines. This interaction may range from simple communication of ideas to the mutual integration of organizing *concepts, methodology, procedures, epistemology, terminology, data,* and organization of research and education in a fairly large field. (p. 3)

The scope of knowledge and the skills necessary to its pursuit are wide and varied. Some students find that their educational goals cannot be met by a single discipline, but may require skills, information, or methodologies traditionally compartmentalized into two or more disciplines: "Academic disciplines have exercised a dominant influence in the way we think, perceive, and seek to understand reality and the universe in the modern world…through particular, specialized, and bounded disciplines" (Giri 2002, p. 104). The disciplinary approach fails because "whatever categories and concepts we use to make sense of reality, they are not adequate to provide us a total picture" (p. 110). Swoboda (1979) puts the argument in stronger language: "Individual specialties on their own, it is now clear, simply do not have the breadth of perspective nor probably the willingness to assume responsibility for offering extensive and intensive solutions to social problems" (p. 83). Klein and Newell (1998) cite an interdisciplinary studies task force sponsored by the Association of American Colleges & Universities, whose findings identify the increasing interdisciplinarity of knowledge: "The reasons include new developments in research and scholarship, the continuing evolution of new hybrid fields, the expanding influence of particular interdisciplinary methods and concepts, and the pressing need for integrated approaches to social, economic, and technological problems" (p. 5).

Moreover, the skills of synthesis and integration necessary for the cultivation of proficiency in multiple disciplines cannot easily be taught within the individual disciplines themselves:

> This process of synthesis requires an appreciation of the full complexity of the disciplines involved, especially an awareness of their

often unconscious assumptions, in order to discern the underlying common ground or conflict between their insights. It is in these acts of conciliation and integration of disciplinary insights that the art of interdisciplinary inquiry is fully realized. (Newell & Green 1998, p. 27)

Interdisciplinary studies programs have evolved to meet these needs. Although arguably still on the margins of the university institutional structure, these programs are nonetheless quickly becoming an established part of the higher education system. In 2003, the National Center for Educational Statistics reported that in the United States, 26,000 students per year graduate with a degree in multi- or interdisciplinary studies, compared with only 7,000 in 1973 (2003, p. 159). In order for interdisciplinary studies programs to continue to have relevance within higher education and meet the needs of students with non-traditional academic goals, interdisciplinary programs must evolve and adapt over time. Priorities need to be identified in order to direct and focus these changes. This study uses empirical research techniques to explore and identify these priorities.

Personal Reflections

At the beginning of this study, I had a great deal of fear and consternation at the scientific rigor demanded by the research methodology chosen. After all, my undergraduate experience had been as an interdisciplinary student at Naropa University, a private Buddhist college in Boulder, Colorado, where my course of study concentrated in fine arts and Eastern philosophy. Although I did not expect the same kind of artistic and intellectual freedom from Texas State that I experienced at Naropa, I soon found that I had enrolled in a diametrically opposite course of study—a Master of Science program. Once I had accepted this fact, I came to the conclusion that in order to become an effective interdisciplinarian, I must diversify my approach to knowledge and understanding and balance my predilection for abstraction and creativity with the methodologies of empirical application (i.e., to acquire skills in scientific research methods which are an essential component to the more complete integration of knowledge as a whole). I decided to investigate a topic near and dear to my heart and thus made interdisciplinary studies itself the subject of my research. Because interdisciplinary studies programs have provided me with an amenable and stimulating academic home, I hoped I might in some small way make an initial contribution to a field that

has had an invaluable impact on my personal and educational development.

Research Methods

The study commenced with a research proposal which formulated the research question and developed an experimental model for investigating that question, including: a review of the literature pertinent to the research question, research objectives, task analysis of research procedures, projected timelines, and models for both formative and summative evaluation of the project. The proposal was reviewed, revised, and approved, and the study was then carried out over the course of the next two semesters. These steps are described in detail below. The project concluded with a final report, a weighty document some hundred pages in length, which detailed the course of the research, presented data including statistical analysis on tables and graphs, and ended with the study's conclusions and recommendations.[1]

The Delphi Technique

The research was conducted using the Delphi Technique: "Named by its RAND Corporation innovators after the greatest of all Greek oracles, Apollo's Delphic Oracle, the Delphi technique is a method for the systematic solicitation and aggregation of informed judgments from a group of experts on specific questions or issues" (Strauss & Zeigler 1975, p. 253). Although the Delphi Technique has many uses and variations, Delphi studies hold a number of characteristics in common, as Strauss and Ziegler (1975) describe:

1. All Delphis use panels of experts for obtaining information or data. (Delphis are founded on the old premise that two heads are better than one.)
2. All Delphis are conducted in writing.
3. All Delphis systematically attempt to produce a consensus of opinion, as well as—and sometimes more importantly—identify opinion divergence.
4. All Delphis guarantee the anonymity of both the experts and identification of the experts' statements throughout the exercise.
5. In extended use of the technique, Delphis use iteration and controlled feedback to converge on consensus or divergence. Participants are permitted to review and revise their statements after reading the statements of their peers, as well as evaluate all statements, reducing

intentional and unintentional "noise" within the exercise, i.e., irrel-
evant, nonproductive, and potentially frustrating communication. (p.
254)

Strauss and Ziegler further add, "Extended Delphis are conducted in a se-
ries of rounds between which a summary of the results of the previous round
is communicated to and evaluated by the participants" (p. 255). The second
and subsequent rounds often result in "a narrowing of the initial spread of
opinions and shifting of the median . . . If no consensus emerges, at least a
crystallizing of the disparate positions usually becomes apparent" (Gordon
1971). Furthermore, as Enzer, Boucher, and Lazer (1971) have noted, "Delphis
are usually better than other methods for eliciting and processing judgmental
data, since they a) maintain attention directly on the issue, b) provide a frame-
work within which individuals with diverse backgrounds or in remote loca-
tions can work together on the same problems, and c) produce precise docu-
mented records."

Of all the experimental models available to the researcher, the Delphi was
most intriguing and seemed particularly suited to a survey of
interdisciplinarians. The interdisciplinary field has been notoriously resis-
tant to the idea of consensus. Some critics have asserted that interdisciplinarity
is by nature incapable of consensus, while some interdisciplinarians them-
selves have argued that the very notion of consensus is antithetical to a field
in which free range of expression and exploration is held as an essential
component of its methodology. The researcher believes that in order for in-
terdisciplinary studies programs to continue to have relevance as an estab-
lished component of higher education, they must also have a semblance of
cohesive identity. Yet, because interdisciplinarity is such a wide and diverse
field, encompassing by its very precepts a multitude of perspectives and opin-
ions, this cohesion cannot be formulated in any absolute terms. However, the
Delphi Technique is quite useful at identifying areas of general consensus
amongst a diverse sample of experts and thus seemed an appropriate experi-
mental model for this study.

One of the advantages of the Delphi is that it is a flexible research tech-
nique which can be adapted to many types and subjects of investigation. The
researcher designed the variation used in this study by examining several
examples of previous Delphis, tailoring a model that would at first openly
solicit ideas from the sample of experts in the designated areas of inquiry,
then narrowing, refining, and synthesizing those ideas in subsequent rounds.
This variation was also designed to be distributable via email and to be final-

ized after three iterations. These characteristics are all quite common to general applications of the Delphi Technique.

Sackman (1974), in what is regarded as one of the more developed polemics critical of the Delphi Technique, asserts that the consensus generated by the Delphi is ambiguous, if not specious. Its claims concerning the standards for expertise and the superiority of group over individual opinion are empirically unfounded. It is prone to vagueness in its questions and responses. Its use of anonymity creates unaccountability in the respondents. Its systematic discouragement of the adversarial process inhibits exploratory thought. Its findings should not be confused with coherent analyses of operationally defined and systematically studied behaviors or events (Sackman 1974). Nonetheless, the Delphi Technique has been, and continues to be, utilized as a reliable research method by innumerable individuals and institutions (Adams 2001, p. 27). However, these criticisms should be addressed rather than dismissed. The validity of the Delphi Technique, in the researcher's opinion, rests mainly upon three conditions: (1) the quality and representativeness of the sample of experts, (2) the rigor of data collection and analysis, and (3) the interpretation and synthesis of the ideas generated.

Quality and Representativeness of the Sample of Experts

The sample of experts was intended to be representative of a cross-section of individuals directly engaged in the instruction and administration of interdisciplinary studies programs. Although the future development of interdisciplinary studies in higher education might seem a subject that will ultimately be decided at the upper levels of university administration, the researcher was more interested in the experience of individuals "on the ground" and therefore in a position to gauge the impact these programs were having on the students participating in them and to identify the problems, needs, and aspirations of such programs. After all, the future of interdisciplinary studies will always truly be determined by the effectiveness of those who choose to be an ongoing part of interdisciplinary studies programs.

The sample of experts was selected by identifying numerous interdisciplinary studies programs on the Internet, sending mass emails to faculty members and administrators of those programs, and soliciting participation in the study. The researcher posted several solicitations on the AIS interdisciplinary listserv (interdis@listserv.muohio.edu), and personally solicited faculty members at Texas State. Sample members were also solicited as a result of

the recommendations of others who corresponded with the researcher. However, most of the sample members were composed of those who responded to the researcher's mass emailings. These efforts resulted in some twenty tentative volunteers for participation in the study. The criteria for the sample members were fairly simple and designed to make the study more manageable: they must all possess PhDs, have been faculty members or administrators of interdisciplinary programs for an average of five years, and commit to completing the study within the allotted time frame.

With some culling and diplomatic arm twisting, fifteen interdisciplinarians were recruited as the sample of experts. Two dropped out during the first round of the study, leaving a sample of thirteen. Dalkey, Rourke, Lewis, and Snyder (1972), with regard to the optimal size of the sample of experts used in a Delphi study, reported that reliability, with a correlation coefficient approaching .9, was found with a group size of thirteen. In terms of quality, all members of this final sample group possessed PhDs and had experience in interdisciplinary studies programs which ranged from 3-30 years, with an average of 10.5 years. As for representativeness, the following areas of concentration were possessed by the sample, in order of frequency: administration, education, philosophy, humanities, interdisciplinary studies, art/art history, music, criminology, cultural studies, curriculum, environmental studies, faculty development, health and human services, political science, psychiatric research, science, sociology, women's studies.

Sackman (1974) questions the claim of the Delphi Technique in representing expert opinion. Indeed, early in the search for the sample of experts, it was pointed out to the researcher that the interdisciplinary field was itself not amenable to the very notion of expertise. The term implies specialization and depth of experience in a particular discipline (or even merely a facet of that discipline). Nevertheless, the researcher would argue that interdisciplinarity has its own set of skills—integration of knowledge, communication across disciplinary boundaries, thematic problem solving, a predilection for experimentation and innovation, among others—which differentiates it from the methodologies of all the disciplines. These skills, like any others, can be mastered; thus, it is indeed possible for one to be an expert interdisciplinarian. However, the scope and time frame of this study, along with the fact that the researcher himself was new to the field and lacked extensive connections with its more prominent members, precluded the luxury of recruiting a sample of experts that consisted solely of that exclusive, auspicious, and essentially subjective criteria. Nonetheless, even the sample members who were newer to the field (indeed some were in the process of

developing interdisciplinary studies programs at their universities) had their own sets of problems, needs, and insights which proved valuable to the study.

Enzer and Boucher, et al. (1971) observe that there is a danger in the Delphi Technique that the sample of experts could be too homogeneous, thus producing skewed responses. Although the range of individuals who participated in the study may have been drawn from a relatively exclusive pool (i.e., practicing interdisciplinary faculty members and administrators), as the research progressed, it was apparent that the sample members' opinions, at least, were hardly homogeneous. Major and fundamental differences as to the future development of interdisciplinary studies programs and the practice of interdisciplinarity in general surfaced during the course of the study. Consensus on many of the final ideas was hard won, and a great many more ideas generated by the study could not be agreed upon. Nevertheless, the study brought together a diverse group of interdisciplinarians who were selected through a largely random recruiting effort and who represent a reasonably inclusive cross-section of persons involved at various stages in the implementation of interdisciplinary studies programs in the United States and Canada. This group had much to say collectively about the development of interdisciplinary programs over the next decade.

Rigor of Data Collection and Analysis

The responses to the study were carefully documented, collated, and summarized. The statistical methods employed in the study are fairly straightforward. In the first round of the study, the sample participants were asked to generate ideas in each of the areas of inquiry and assign the ideas a rank order, from one to five, one being the highest. In subsequent rounds, they were asked to assign each of the synthesized ideas a level of priority from one to five, five being the highest priority. These scores were analyzed and used objectively to determine the level of consensus for each idea. The analysis was formulated into extensive tables, graphs, and summary statements. These processes are described in more detail below as they apply to each round. This analysis consumed a great portion of the final report.

Interpretation and Synthesis of the Ideas

One of the criticisms often cited against the validity of the Delphi Technique is that it is vulnerable to manipulation by the researcher coordinating it. It is incumbent upon the researcher to collect all the responses from the

participants and synthesize them into ideas which will eventually achieve consensus. This process, although informed by statistical analysis of the responses, necessitates a degree of editorial license. In formulating the ideas generated by this study into comprehensive statements, this researcher attempted to extract common kernels of collective opinion and include qualifying or dissenting responses, thereby transforming the ideas from their original intention into a collective synthesis. This reformulation inevitably distorted those ideas. To compensate for the subjectivity inherent in this process, the researcher endeavored to enter into the research without expectation and made every effort to keep the collective responses to each idea as intact as possible.

More specifically, as mentioned before, the concept of consensus, like the term expert, seems particularly problematic to interdisciplinarity, which is often construed as a "catch-all" academic category and intrinsically opposed to focus or exclusion. Indeed, there were individuals within the study's sample who adamantly took this position. These individuals resist any attempt to "discipline" interdisciplinarity or define its own methodology, preferring instead to envision interdisciplinary studies, as one sample member phrased it, a "wide open meadow of inquiry," an organic accumulation of art and scholarship and applied problem solving. According to this camp, the idea of consensus constituted closing the doors on the unfettered pursuit of experimental and individualized education and therefore could not be approached in an unqualified manner. Their perspective created some interesting problems for the study, which will be explored in more detail later in this paper.

In a few cases, such as support for interdisciplinary programs in the upper levels of university administration and decisions regarding budget and tenure, the ideas originally formulated readily achieved consensus with little need for reformulation. However, in most instances, such as the development of interdisciplinary methods courses or curricular sequences, the researcher had to reword and qualify the ideas carefully in order to bring about consensus amongst a dissentious range of opinions.

The Delphi Study

Round One

The first round of the study consisted of developing, validating, and distributing the initial Delphi questionnaire. In reviewing the professional interdisciplinary literature, five areas of inquiry were identified:

1. Curriculum: Changes affecting the selection or development of coursework, texts, or other materials and formats to be used as educational resources.

2. Teaching Methods: Changes affecting instructional techniques, such as presentation, cooperative teaching, level of student-teacher interaction, fieldwork, or thematic emphasis.

3. Faculty Development: Changes in the training and professional growth of faculty members which will enhance their effectiveness in addressing the interdisciplinary needs of students.

4. Administration—Changes in the policies and procedures governing interdisciplinary studies programs as well as in the hierarchical university structure which makes crucial decisions relating to budget or resource allocation, personnel and staffing, governance, evaluation, advisement, and public relations.

5. Program Delivery—Changes in the formats by which students may complete their coursework outside of a traditional classroom setting, whether through technology, networks, the Internet, distance learning, or independent study programs.

It was made clear in the instructions for the questionnaire that the descriptions of these areas were neither exclusive nor exhaustive. Because interdisciplinary studies programs are administered differently at the undergraduate and graduate levels, each area of inquiry was divided into these two categories. The questionnaire also provided general guidelines for generating ideas and setting priorities for the development of interdisciplinary studies programs. The participants were urged to respond with ideas which could be generalized to interdisciplinary studies programs in all their various incarnations, and they were asked to be mindful that the goal of the Delphi technique is to formulate consensus among a diversity of opinion. In this round, the sample was instructed to generate from one to five ideas in each of the areas of inquiry and to assign the ideas a rank order. The developed questionnaire was approved for content validity by a jury of three faculty members of the Interdisciplinary Studies Program at Texas State University. The questionnaire was then distributed to the participants via email.[2]

This initial round of the study was designed as a shotgun approach, openly gathering ideas from the sample of experts for directions of change in interdisciplinary studies. The responses to round one were collected, and a total of 309 ideas were generated. The responses were collated into idea ar-

eas, in which several individual ideas addressed a common theme. Occasionally, some of the ideas were shifted from the areas of inquiry where they originally appeared into areas that better addressed them. For example, some ideas about fieldwork (i.e., instructional opportunities for students to learn interdisciplinary skills from interaction with the community or other cultures) were originally assigned to the area of teaching methods by some sample members. Because the study's definition of program delivery better suited these ideas, they were shifted to that area of inquiry. By summing the ordinal ranking the collected ideas were assigned, these idea areas were prioritized; and the results tabulated.

Round Two

Using this information, the questionnaire for the second round was designed. The idea areas were synthesized into single statements. Also, some provocative statements made by one or two respondents seemed worthy of further exploration and consequently were included. There were 59 ideas included in the second questionnaire. The sample of experts was instructed to evaluate these ideas, assign them a level of priority from one to five, and provide comments on their strengths and weaknesses. The researcher collected the responses, calculated the mean and standard deviation for each idea, and collated the experts' comments. The level of consensus was determined according to the mean of their level of priority: ideas of 4.0 or greater were considered to have achieved consensus; ideas of 3.5 but below 4.0 achieved semi-consensus, and ideas below 3.5 did not achieve consensus.

The standard deviation of the responses was used to determine whether those ideas on the cusp of consensus or semi-consensus should be included in the third round. For example, a couple of ideas achieved a mean level of priority equal to or slightly greater than 4.0. However, the standard deviation of the responses was also significantly higher than the average of 1.02. This indicated that, although the majority of the respondents placed a high priority on the idea, a significant number of other respondents were in complete disagreement with it. In these cases, the researcher assigned the idea semi-consensual status, even though the mean level of priority was equal to or above 4.0. Consensual ideas were set aside for the final report; non-consensual ideas were discarded, and semi-consensual ideas were included in the next round.

Round Three

The third round of the study consisted of a synthesis of the 20 semi-consensual ideas from round two. These ideas were reformulated, taking into account the comments they received. Ideas that were all but identical at the undergraduate and graduate levels were combined into single general statements. The third questionnaire was distributed to the sample of experts, and their responses were collected and analyzed as in the previous round. In analyzing the responses, the researcher found that the synthesis of the ideas in this round, although successfully bringing some of the ideas to consensus, brought others to a higher state of disagreement. This is indicative of the problems of consensus and subjectivity inherent in the Delphi Technique. By qualifying and rewording the ideas in light of the comments they received, some participants' concerns were addressed, while others' ideas were watered down or distorted to the dissatisfaction of those sample members. Specifically, on a few occasions, the original authors of an idea were so displeased with the way it was reformulated that they assigned the synthesized idea a very low level of priority, effectively "disowning" it. However, a total of nineteen ideas did achieve consensus, and these constituted the conclusions of the final report.

Research Findings

The final formulations of the ideas developed in the study were in some cases reworded for clarity or to incorporate some of the later comments offered by the sample of experts. This process entailed properly qualifying each idea while preventing them from becoming too convoluted. In what follows, each idea is quoted after its heading, using exactly the same wording as appeared in the final report; and the following paragraph or paragraphs comprise the researcher's own comments and recommendations about that idea, information gained from the professional literature related to the idea, and examples of divergent opinions among the sample. The latter is included to give the reader the benefit not only of the broad range of opinions generated by the study, but also of an understanding of the researcher's process in interpreting and synthesizing the ideas themselves.

It is also worthwhile to note that some of the ideas overlap and occasionally reiterate common themes. Although the researcher initially delineated the ideas generated in the first round of the study; thereafter, as the com-

ments aggregated upon each idea, some overlap was inevitable. This study did not emphasize exclusivity in the statements it generated. Indeed to do so would, in the researcher's opinion, have tampered with the methodology of the Delphi itself, which encourages feedback from the respondents to steer the development and synthesis of the ideas. Moreover, the fact that there are general themes which recur in some of the ideas may indicate that there is a more generalized consensus in interdisciplinary thought underlying the specific idea statements.

This is further illustrated by the instances in which many of the ideas expressed in this study correspond to those previously published in the interdisciplinary professional literature. This study was conducted as an original project, and its findings were intended to stand alone. However, the resemblance of its findings to past literature is due, at least in part, to the fact that many participants in the study were undoubtedly familiar with that literature, including the researcher himself. Indeed, some of the experts in the sample have made significant contributions to the literature. Nonetheless, that such a broad spectrum of interdisciplinarians, and the subjective recommendations of the researcher, should concur with many of these previously published ideas regarding the future development of interdisciplinary studies programs, in an original, scientific research project, only serves to reinforce and validate those ideas.

If the time constraints of the study had allowed further iteration, there were many ideas which might have achieved consensus. Examples include the establishment of interdisciplinary doctorate programs, the incorporation of general education requirements into the interdisciplinary curriculum, direct instruction of interdisciplinary methodology at the undergraduate level, support in faculty development programs for the techniques involved in scholastic mentorship, and the need for interdisciplinary studies programs to explore alternative learning opportunities. These ideas, and many others which did not quite achieve consensus as defined by the study's objectives, are worthy of further discussion and exploration in subsequent studies or articles.

Curriculum

In the area of curriculum, five ideas achieved consensus: (1) theme-based interdisciplinary curriculum, (2) interdisciplinary curricular sequence, (3) multidisciplinary text, (4) methods of interdisciplinary studies courses, and (5) philosophy of interdisciplinary methods courses. Ideas 2 through 4 apply to the undergraduate level; idea 5 applies to the graduate level.

1. Theme-Based Interdisciplinary Curriculum

Because interdisciplinary studies is essentially a borderless field, there is a danger that study in this field can become something of an amorphous endeavor, and an interdisciplinary student can become lost in its breadth. Theme based curricula builds an explicit interdisciplinary focus through proactive integration around a designated theme, issue, idea, problem, or question. This provides a hands-on involvement in the process of learning, in which the benefits and limits of disciplinary approaches are revealed and new methods are created. Although students may concentrate in various focus areas, designating a theme proactively ensures that all coursework clearly relates back to the central nature of the curriculum. The application of scholastic rigor, providing a student with academic structure and standards, provides interdisciplinary students with substantive depth in their chosen area.

Many established interdisciplinarians have hailed theme-based curriculums as a way to focus interdisciplinary studies and make it more academically acceptable. As described by the AIS Taskforce on Accreditation Standards for Interdisciplinary General Education Programs (2000), "They [interdisciplinary programs] frequently are organized around themes, problems or issues, cluster disciplines in knowledge-domain offerings [such as humanities, social sciences, natural or life sciences]." This concurs with the earlier assertions of Hursh, Hass, and Moore (1998) that "a general education model using this scheme would be concept based [or theme-based] … rather than discipline based. It would specify certain concepts or problems to be examined from multiple perspectives" (p. 39).

The need to apply the same level of scholastic standards as is done by faculty in the disciplines is important in order to establish interdisciplinary studies as credible. The main arguments against this idea, as will be seen throughout this study, have to do with concerns about focusing interdisciplinary studies too rigorously, thus limiting its practitioners' ability to experiment and innovate. There is a fear that theme-based curriculums might engender a movement for standardization of interdisciplinary programs. Therefore, it is recommended that theme-based instruction should be individualized to each program, according to the needs of the student population and the makeup of faculty members within the program. Students need to participate at some level in the process of determining themes, or at least their individual focus areas, thus ensuring that the program "is interactive, that is, it does not just call for a one-way flow of information into the minds of

students; rather it insists that students act upon that information and construct ways of organizing it. This is essential in order to stimulate cognitive development" (Hursh, Hass, & Moore 1998, p. 39). It is important to balance scholastic rigor with academic freedom; interdisciplinary studies can benefit from more cohesion, but not at the expense of its flexibility to address unprecedented academic problems in novel ways.

2. An Interdisciplinary Curricular Sequence

In order for interdisciplinary studies to achieve a more cohesive identity, it can benefit from a curricular sequence. Such a sequence will undoubtedly vary from program to program, depending on the emphasis of the particular program, the institution within which it is housed, and the needs of the students enrolled within it. However, sequencing avoids the fragmentation common to many interdisciplinary programs and provides a "road map" for students who might choose to participate in a given interdisciplinary program. A general example of such a sequence might include: An introduction to the interdisciplinary field, focusing on the basic tenets of interdisciplinary endeavor, i.e. the mixing of disciplinary approaches as a means to enhance a general scope of knowledge. This could be followed by an interdisciplinary methods course which exposes the student to methodologies specific to interdisciplinarity—the ability to research and synthesize a multiplicity of disciplinary perspectives, and communicate that synthesis within a variety of contexts. Having a foundation of basic abstract interdisciplinarity, upper class interdisciplinary students might then be given the opportunity to apply those methodologies to a specific problem or project. Although such a sequence may now only be generally conceivable, and the specifics of interdisciplinary methodology are presently lacking in definition, through experimentation and practice, interdisciplinary studies programs may enhance their effectiveness via a more organized and sequential curricular approach.

This statement about curricular sequence is an example of that Delphi tendency of synthesizing a diversity of opinions into a statement so highly qualified that it borders on convolution. Although in this instance the statement eventually achieved consensus, there was some dissent in the initial formulations of the idea concerning the nature of the sequence itself. Some thought that a sequenced curriculum might be difficult to execute, might overwhelm students, or might fail to account for students who come into interdisciplinary studies programs at the upper divisional level. Some respondents felt that students should start with a concrete problem and then, through practical

application, go on to explore the more abstract aspects of interdisciplinary theory. The AIS Taskforce (2000) recommends that interdisciplinary general education programs "should consider at what stage undergraduate students take courses in the program, whether there are courses available for students at both the lower and upper divisions, and how students perceive coherence," and they should consider "the integrative coherence of all elements within individual courses" (p. 4).

This curricular issue is still unsettled; therefore, it is recommended that in order for an interdisciplinary curricular sequence to become an established component of interdisciplinary studies programs, it is necessary for various programs to develop prototypes of such sequences. Experimental application of prototype curricular sequences, assessment of their effectiveness, and dissemination of the results throughout the interdisciplinary community can aid interdisciplinary studies programs in structuring their curriculum.

3. A Multidisciplinary Text

The development of a text which provides an overview of various disciplinary perspectives and methodologies, followed by a section providing basic integrational methods along with concrete examples. Such a text is especially important at the lower divisional levels, when beginning students are more dependent upon textbooks to provide structure to their learning process. Furthermore, there is a general need for more textbooks focusing upon interdisciplinary studies which are accessible to classroom instructors.

Few could argue with this idea, and many lamented the fact that such a textbook was not already available. Indeed, this researcher is also unaware of the existence of a textbook as described in the idea above and feels personally unqualified to envision such a text in more detail than is already presented in the idea. Constructing such a text, besides being quite a laborious undertaking, also runs the risk, according to some sample members, of standardizing interdisciplinary education. However, interdisciplinary teachers and students need resources as much as do teachers and students in any discipline, and the development of such a textbook would help establish the field academically and be an invaluable aid to instructors within it. The researcher proposes that a multidisciplinary textbook should be developed by a committee representative of the broad spectrum of the interdisciplinary field. Individual members of the committee should be responsible for individual disciplinary sections of the text and should identify proper text (or commission a specialist to compose text) for each chapter in the disciplinary over-

view. The committee as a whole should identify or commission texts for what is arguably the most needed section on integration: interdisciplinary methods.

4. Methods of Interdisciplinary Studies Courses

Students need to understand interdisciplinary methodology to appreciate the way that disciplines are merged or contrasted. Courses should demonstrate to students how to integrate knowledge across the disciplines in ways that are systematic and synthetic. In terms of research methods, such courses should draw from the different disciplinary approaches, but establish a unique integration of qualitative, quantitative, comparative, historical, documentary, and case approaches. The development of such courses would establish a unique methodological foundation for interdisciplinary studies and provide students with a basic understanding of integrative approaches to learning.

Again, this idea brought out the afore mentioned conflict between the camp of interdisciplinarians who esteem "structure" and that which prefers "openness." Dissenting opinions expressed concern that creating a definition of interdisciplinary methodology is antithetical to interdisciplinarity because it would hamper its ability to address new and uncharted fields of academic inquiry and turn interdisciplinarity into a new discipline by establishing a unique and fixed method. The AIS Taskforce (2000) concludes that what is "particularly important for interdisciplinary programs, however, is having a plan for the development of the curriculum which carefully focuses on its integrative and coherent features" (p. 4). The researcher's own thoughts regarding this conflict is that it need not be a conflict at all. The two approaches, oft-times metaphorically described as Apollonian and Dionysian (see article by Newell et al. in this volume), can themselves be synthesized, as can any allegorical dichotomy. The establishment of a unique interdisciplinary methodology must incorporate the characteristics of innovation and creativity necessary to interdisciplinary endeavor. Agreement on the core values of interdisciplinary methods should come about through an ongoing process of collaboration, experimentation, assessment, dissemination, feedback, and synthesis. The development of integrative methodologies should be in itself an integrative process.

5. Philosophy of Interdisciplinary Methods Courses

It is essential to study interdisciplinary methodology [in graduate interdisciplinary education] so that teachers and researchers can be reflective

about different approaches. The development of such courses would elaborate the relationship between theory and method in interdisciplinary research and expand the realm of interdisciplinary studies vertically, to integrate not only knowledge across disciplines, but also both objective and experiential knowledge embodied in different levels of hierarchical organizational structure—in other words, teach methods of transdisciplinarity. This becomes all the more crucial at the graduate level, where the future faculty are being prepared, whether in disciplines, professions, or interdisciplinary fields.

In essence, this idea is an advanced form of the previous idea at the undergraduate level. It implies that a graduate student of interdisciplinary studies should explore the concept of interdisciplinarity as a thing unto itself, cultivating the skills, practices, and philosophy of a dedicated interdisciplinarian. The establishment of advanced "philosophy of interdisciplinarity" courses would lend more credence to the notion that interdisciplinary studies is indeed a field within which one can gain higher levels of mastery and expertise. In addition to the concerns about establishing a unique interdisciplinary studies methodology at any level, many respondents questioned the use of the term, transdisciplinarity, as a disputed and undefined concept, which would be difficult under these conditions to teach. The term was included in the idea because it was used by one or more sample members who contributed to the original formulation of the idea. Editing the use of terminology would have interfered with the natural progression of the study, where such matters of debate were hammered out within the Delphi methodology. Indeed, a couple of ideas did not achieve consensus due in great part to their use of the term.

Nonetheless, transdisciplinarity is a powerful term with potentially powerful connotations and deserves to be explored and clarified. For the record, Newell (1998) offers a working definition: "Transdisciplinarity . . . differs from interdisciplinarity in that it seeks an integration so comprehensive and fundamental that the contributing disciplines are subsumed under or replaced by a kind of superdiscipline, such as general systems theory, Marxism, or structural functionalism" (p. 531). Such a conceptualization has the promise of moving the interdisciplinary endeavor beyond the integration of disciplines toward the more ambitious undertaking of revisioning the way in which we organize, assess, and apply knowledge. As in most other areas of disagreement within interdisciplinary studies, the clarification of this term should be accomplished through a process of collaboration, dissemination, feedback, and synthesis which eventually leads to productive consensus among the practitioners within the interdisciplinary studies field.

Teaching Methods

Three ideas achieved consensus in the area of teaching methods: (1) team teaching, (2) scholastic mentorship, and (3) joint faculty/student interdisciplinary activities. The first idea applies to the undergraduate level; ideas 2 and 3 apply to the graduate level.

1. Team Teaching

Although team teaching faces time and budgetary constraints, it is an effective way to implement interdisciplinary studies. Involvement of faculty from disciplines in interdisciplinary courses along with interdisciplinarians would draw out their own interdisciplinary possibilities. More team teaching opportunities between the disciplines would give students the benefit of seeing an interdisciplinary dialogue in practice. Such models should include team planning, content integration, development of course materials, delivery (instructional methods), assessment of student learning, and evaluation of the course itself.

Team teaching has been a mainstay of the interdisciplinary canon for some time. Newell and Green (1998) offer one explanation for its popularity: "The interdisciplinary method itself is easily learned through alertness to differences between disciplines and through close examination of disciplinary assumptions, but foremost, it is learned through team teaching with colleagues experienced in interdisciplinary studies" (p. 32). However, team teaching is a difficult process. "The availability of more than one person to present the material is far outweighed by the time necessary for coordination, for melding divergent views … and for developing a language through which to communicate clearly" (Armstrong, 1998, p. 178).

Along with the time and budget complexities mentioned, dissenting responses expressed concern that team teaching might cause the career objectives of individual team teachers to suffer or that it might engender confusion in undergraduate education. These problems can only be addressed through administrative commitment to interdisciplinary studies among the various disciplinary departments whose faculty members are involved in team teaching. Disciplinarians must be convinced that interdisciplinary activity is in the interest not only of the development of those faculty members involved, but also in the development of the disciplines themselves. Thus, team teaching needs to be supported in terms of merit pay and recognition of professional development. Furthermore, so as to have the greatest benefit to students,

team teachers should take a collaborative, rather than adversarial, approach to direct instruction, modeling constructive dialogue as a means to explore more fully issues or problems and helping students to understand that these matters often cannot be definitively resolved by choosing a single, "winning" viewpoint.

2. Scholastic Mentorship

This concept involves the matching of students with advisor/faculty having expertise in focus areas as well as the interdisciplinary approach, as early in the program as possible. It includes the acculturation of faculty to models where teaching, advising, and mentoring are shared responsibilities, incorporating a philosophy of teacher-learner-facilitator, rather than the traditional role of professor, thus engaging in collaborative learning with students. This is crucial in interdisciplinary programs to assure that someone "owns" these students, i.e., that they do not drop through the cracks of traditional organizational units.

Scholastic mentorship is a wonderful ideal which creates a kind of super professor, who is able to personally guide a graduate student through the maze of interdisciplinary education. Although this idea did achieve consensus relating to graduate education, it did not quite achieve consensus relating to undergraduate education, mainly due to concerns about the incredible time commitments required in working with undergraduate students. According to some members of the sample, the time commitments are greater in the undergraduate setting because there are usually a good deal more undergraduate students than graduates involved in a given interdisciplinary studies program.

There were also concerns that the effectiveness of such individualized and interactive advising and mentoring relationships are dependent upon the quality of the faculty members involved. The quality of faculty is important in any educational endeavor, but it is especially crucial when it comes to mentoring which engages additional skills that more traditional teaching methods may eschew. As the AIS Taskforce (2000) asserts, "Knowing the students and providing opportunities for student input and feedback will aid [the process of integration], as will both formal and informal assessment methods" (p. 5). In order for scholastic mentorship to be effective, administrators of interdisciplinary studies programs should allot sufficient time for faculty members to perform this responsibility and count it as part of their professional activities within the program. These efforts should be commen-

surately ranked among their other responsibilities, such as classroom teaching, and should be evaluated and rewarded accordingly.

3. Joint Faculty-Student Interdisciplinary Activities

Examples of these activities could include: the opportunity to participate in, or observe, differing types of teaching and learning methods; participation in team teaching with students or faculty from other disciplines, involvement of students in faculty members' interdisciplinary research projects (regardless of the disciplines involved), an online graduate student/faculty journal of interdisciplinary theory and research methods, or a graduate seminar/mini conference once a semester at which students and faculty present their interdisciplinary research projects to faculty and fellow students.

This idea and the examples that follow it are a compendium of suggestions by various sample members and are not meant to be exhaustive. Joint activities not only enable interdisciplinary faculty development, but also give graduate students opportunities to put theory into practice. On the other hand, as stated by Hewitt and Lanser (1998), collaborative projects are generally time consuming and run the risk of spreading faculty efforts too thin: "One of the difficulties confronted by any collaborative or joint program at the graduate level, is that of fostering a sense of community among students and faculty who have responsibilities to multiple units within the university and often to organizations outside it as well" (p. 237). In order to avoid overloading students, these activities should be a part of an interdisciplinary student's course load or should count as credit toward the completion of their degree. Faculty members should be allowed leeway to conduct such projects and be recognized for participation in such activities as part of their professional development.

Faculty Development

Three ideas achieved consensus in the area of faculty development: (1) official recognition of interdisciplinary activities, (2) promotion of interdisciplinary interests within faculty development programs, and (3) training in teaching methods.

1. Official Recognition of Interdisciplinary Activities

Faculty who conduct innovative teaching or research that is interdisciplinary in nature, whether within or outside of interdisciplinary studies pro-

grams, should receive official recognition within the university system. Such recognition could include awards granted by the university or a national organization, and should count toward professional development requirements of the university and be accorded due weight in decisions regarding the promotion and tenure of faculty members in all programs.

This idea relates to others listed in the area of administration and will be more fully commented upon there. Official recognition of interdisciplinary activities is contingent upon interdisciplinary studies establishing its value within the university as a means of addressing academic problems in a way no single discipline can. Those bodies that recognize and reward faculty development must be convinced of the validity of interdisciplinary activity as an important component of professional growth.

2. Promotion of Interdisciplinary Interests within Faculty Development Programs

Traditional faculty, as well as new arrivals, should have the opportunity to investigate and explore interdisciplinary concepts as a part of the faculty development options available to their evolution as instructors. Such initiatives would not only generate more understanding and support for interdisciplinary study, but could aid in the overall quality of education within the university through the innovative and stimulating nature of the interdisciplinary approach itself. These programs could take many forms, including lectures or workshops led by interdisciplinarians, partnering of traditional faculty with interdisciplinary faculty, etc. Participation in such programs should count toward the professional development requirements of the university.

Faculty development provides a good forum for interdisciplinarians to spread the word. Armstrong (1998) discusses its felicitous effect:

> These dimensions of interdisciplinary efforts—close peer support, a focus for which anyone's previous education is presumed to have been inadequate, and the necessity to be both teacher and learner simultaneously—are ones that simple retraining in a closely allied field cannot offer, and that compel us to consider interdisciplinarity a viable alternative model for faculty development. (p. 177)

Interdisciplinary studies faculty should avail themselves of this forum as a means to advocate and disseminate the value of interdisciplinarity. There are almost assuredly faculty members in every department who feel con-

fined by the boundaries of their chosen discipline. These faculty not only might be enthusiastic about broadening their academic horizons through the collaboration of interdisciplinary activity, but their professional development would also benefit thereby. As West (1999) enthusiastically recommends, "To those who are being poisoned by burnout, where teaching is not as intrinsically rewarding as it used to be and the sense of staleness cannot be shaken, I respectfully prescribe the interdisciplinary antidote for the renewal of your mind and spirit" (p. 85). Faculty such as the ones West describes could take the rewards of interdisciplinary activity back into their disciplinary departments and thus help engender support of interdisciplinary studies in general.

3. Training in Teaching Methods

In order to promote the effectiveness and viability of interdisciplinary faculty within the university, such faculty should avail themselves of training in traditional instruction, while being provided with the opportunity to explore and assimilate innovations in instruction, course design, learning methods, and the technological advancements which impact these areas. Although this applies to all faculty members within a given university, it is especially incumbent upon interdisciplinary faculty, as a keystone to progressive thought in higher education, to keep themselves abreast of the ongoing evolution of academic pedagogy. "Preparing Future Faculty" initiatives could be a component of this process, proactively incorporating faculty development into graduate education, allowing graduate students with aspirations of professorship the chance to receive training in instructional methodologies.

Training in teaching methods is beneficial to all instructors, but in many instances, it has become an afterthought. Most professors at a given university have extensive knowledge of their discipline and thorough training in its skills and methodologies; yet, they are often expected to pick up instructional techniques on their own along the way. Because interdisciplinary study lacks the background of the history and methodology of the disciplines, it is arguably on the forefront of innovations in teaching methods and requires keen instructional skills. Interdisciplinary faculty should not only seek training in this area, but, where it is lacking in current faculty development programs, they should proactively keep abreast of ongoing research in educational models and present this research in faculty development programs, thus promoting through example the betterment of instruction throughout the university.

Administration

Seven ideas achieved consensus in the area of administration: (1) upper echelon support, (2) better incorporation of interdisciplinary studies in the university structure, (3) inclusion of interdisciplinary initiatives in decisions regarding resource allocation, (4) establishment of interdisciplinary tenure lines, (5) higher visibility of interdisciplinary studies programs, (6) the loosening of structural barriers between interdisciplinary studies and traditional departments, and (7) clear vision and articulation of interdisciplinary studies. The first five ideas are related; therefore, the bulk of commentary will follow the fifth idea. Idea 6 applies to the undergraduate level; and idea 7 applies to the graduate level.

1. Upper Echelon Support

Clear statements of support for interdisciplinary initiatives at the highest academic levels (president, provost, vice presidents, deans) are needed to ensure that interdisciplinary faculty and students are full participants in the university experience, i.e. have access to resources, classes, advising, scholarship funding, etc. Upper level administrators should have knowledge of interdisciplinary programs, be willing to champion interdisciplinary curriculum, teaching methods and faculty development, insure protection of interdisciplinary activities, and oversee the coordination of interdisciplinary course work with that of other departments.

This idea not only achieved consensus; it practically achieved unanimity. This response goes to show that, if interdisciplinarians can agree upon anything, it is what they wish their administrators to do for them.

2. Better Incorporation of Interdisciplinary Studies in the University Structure

The ongoing clarification of how interdisciplinary courses and programs are incorporated within the organizational structure of the university will aid in the viability and status of interdisciplinary studies programs, by better defining such issues as resource allocation, enrollment credit, faculty loads, the ability for interdisciplinary courses to fulfill requirements in general education or other departments, and the position of interdisciplinary programs within the degree plans of the university as a whole. However valuable this sense of place in the university may be, interdisciplinary studies programs

should take care to avoid becoming so rooted in the disciplinary structure of the university that they lose their ability to provide innovative approaches to the exploration of knowledge, which is inherently antithetical to the rigorous imposition of structure in general.

As in many of the ideas, this one is carefully worded so as to balance the needs for establishing interdisciplinary studies as a field in its own right and integrating it into all levels of the university, while retaining openness, that is, space for innovation and experimentation.

3. Inclusion of Interdisciplinary Initiatives in Decisions Regarding Resource Allocation

Separate and equal budget resources as other departments, and the ability to distribute them flexibly. Utilization of financial resources to encourage such things as: faculty/student research, attendance at conferences together, joint publication, a visiting professorship in interdisciplinary studies, or the distribution of scholarship funds specifically for graduate students in interdisciplinary programs in order to grant them more free time to form ideas outside the classroom about research projects, to build a team that will work together, etc.

As the AIS Taskforce (2000) makes clear, "In an institution with a well-supported interdisciplinary…program, additional budgeting procedures assure that the program continues to receive stable and adequate support" (p. 9). Although few could debate that adequate financial resources must be made available for interdisciplinary programs, some respondents expressed concern that the competition for resources might engender conflict and resistance to interdisciplinary studies. Benson (1998) presents the argument that in competing for funding among university departments, "the interdisciplinary studies programs, with their heavy reliance on team teaching methods, special events, independent study and relatively low faculty-student ratios, are extravagant and cost ineffective" (p. 107). However, competition over resources is an intrinsic component of the survival of any organizational structure.

4. Establishment of Interdisciplinary Tenure Lines

Tenure lines need to be established in order to guarantee that interdisciplinary activities will be counted in the reward system of tenure, promotion, and salary.

This idea achieved a very high level of consensus. The lack of committed interdisciplinary tenure lines is a great obstacle to the recruitment of dedicated interdisciplinarians in higher education. As a result, interdisciplinary

studies continues to be a fairly risky career choice.

> There is much more to master, and most interdisciplinary scholars have found it necessary to have multiple masteries in order to succeed in the contemporary academy. Even those few whose doctorates are in interdisciplinary fields tend to acquire recognizable disciplinary skills, because job prospects in interdisciplinary programs remain severely limited. (Katz 2001, pp. 522-523)

Joint appointments should also count toward interdisciplinary tenure lines.

5. Higher Visibility of Interdisciplinary Studies Programs

In order to become more recognizable and accessible to students, faculty, and community members alike, interdisciplinary studies programs should promote higher visibility both within the university and in the community. Interdisciplinary programs should be clearly and notably presented and easily referenced in all official publications—catalogs, websites, organizational charts—and within the university's advising structure. Visibility can also be promoted through the proactive activities of interdisciplinary faculty members by involving themselves directly in university-wide committees, seminars, or faculty development events and by otherwise helping to create a more prominent role for interdisciplinary studies as a vital, exciting, and innovative component of higher education. Outreach is also needed in order to make the community aware of the presence of interdisciplinary programs and the value of interdisciplinary techniques in application to practical community problems.

These five ideas all concern themselves with creating a higher level of acceptance of interdisciplinary studies, eventually culminating with its establishment as a fully recognized and funded peer in the university structure. Klein and Newell (1998) point out the marginal status to which interdisciplinary studies programs are often relegated in the university structure: "On too many campuses, good interdisciplinary programs are minimally visible in catalogs and bulletins. Correspondingly, they are underrepresented in admissions and counseling" (p. 11). "An effective interdisciplinary general education program maintains visibility and focus. Ongoing efforts are in place to keep faculty and students aware of the program and informed about its goals" (AIS Taskforce 2000, p. 9). Friedman (2001) recognizes the historical difficulties interdisciplinary studies have experienced along the way:

> The current rush to interdisciplinarity in the academy began at a slow
> crawl, much resisted and often experienced by those who did it as
> terribly risky. This early period was the heyday of disciplinary bound-
> aries, when interdisciplinary work of any kind was largely suspect,
> regarded at best, as a "fad" and at worst as academically illegitimate,
> a kind of intellectual miscegenation that many faculty opposed with
> all the force and emotion of a taboo. (p. 504)

As the AIS Taskforce (2000) points out, "Faculty participating in interdis-
ciplinary education programs, in particular, need support in areas of faculty
development, promotion and tenure processes, and incentives for participa-
tion in the programs" (p. 6). Nonetheless, the process of legitimizing
interdisciplinarity has made significant progress and will continue to do so.
However, it will require activism on many levels for these ideal goals to be
reached. Interdisciplinary studies must become a vested interest of the uni-
versity. This could initially occur through the ongoing advocacy for the value
of interdisciplinary studies to upper administration. At times, senior admin-
istrators may use the term, interdisciplinarity, without the benefit of a deep
understanding of what interdisciplinary studies is all about. This is a state of
affairs interdisciplinarians must strive to correct.

Moreover, for interdisciplinary studies to be truly at home in the univer-
sity, faculty members who have participated in and appreciate interdiscipli-
nary studies programs must eventually seek and obtain positions at these
"upper echelon" administrative levels. In order to influence decisions re-
garding organizational structure, resource allocation, or tenure lines,
interdisciplinarians must have a voice in the decision-making bodies which
establish these policies. Participation in the university structure is a two-way
street; if interdisciplinary studies wants a seat at the table, it must endure its
share of the tedium of committee membership and the drudgery of the nuts
and bolts mechanics of running the university. The AIS Taskforce (2000)
recommends that oversight of interdisciplinary general education programs
should be "shared by faculty representatives from across the units of the
institution" (p. 6). Bringing such a broad cross-section of faculty into the
interdisciplinary fold can provide an inclusive institutional base for the over-
sight of these programs, while simultaneously avoiding the confusion of in-
terdisciplinary studies with the disciplines.

For interdisciplinary studies to establish its value in the minds of adminis-
trators and decision-makers, interdisciplinarians must make a case for inter-
disciplinary studies which is tied to the university's strategic plan. Interdisci-

plinary studies programs are a necessary component of contemporary higher education because they provide unique and necessary educational services. As Newell and Green (1998) point out, "Underlying such calls for an interdisciplinary component to liberal education is a recognition that the interdisciplinary studies encourage breadth of vision and develop the skills of integration and synthesis so frequently demanded by the problems of a culture in the midst of a profound transition" (p. 23). Also, historically speaking, innovation in the arts, science, and philosophy have often resulted from the synthesis of perspectives. Interdisciplinarity is a natural and essential approach to the investigation and application of knowledge.

A case for interdisciplinary studies can be successfully argued and effectively supported, but it is incumbent upon interdisciplinarians to make it persuasive. Promotion requires legwork. Whether it is serving on committees, researching and presenting seminars on teaching methods, meeting with the upper echelon on a regular basis, initiating interdisciplinary faculty development activities, presenting the results of faculty or student interdisciplinary projects, writing copy for university publications, initiating contact with disciplinary faculty for team teaching or collaborative research—promotion of interdisciplinary interests can only occur through the efforts of those who choose to voice them.

6. The Loosening of Structural Barriers Between Interdisciplinary Studies and Traditional Departments

This could be accomplished through such means as joint appointments, cross-listing courses, enabling faculty participation in both, infusing innovations and new research developments into the curriculum, examining carefully the question of program versus department status, by allowing interdisciplinary courses to satisfy core basic studies requirements and to be transferable between departments for credit.

Some of the study's respondents expressed concern that this idea blurred interdisciplinary studies, might confine its role to that of a provider of general education, or could further lead to interdepartmental conflict. Indeed, such conflict is inevitable due to the revolutionary nature of the overhaul to the university structure proposed by this loosening of traditional academic boundaries. Newell (1998) describes problems arising from the growing inclusion of interdisciplinary studies in the university organizational structure: "At the general education level alone, college and university faculty teach thousands of interdisciplinary courses each year in the United States and

face thorny curricular and pedagogical issues" (p. 530). However, this idea
does help distinguish what is essentially unique about interdisciplinary stud-
y's role within the university structure and what fully differentiates it from
the disciplines. Interdisciplinary study serves both as an interface between
disciplines and as a potential means for an integrational overview of all edu-
cation. In this view, it has both a peripheral role as the bridge between disci-
plines and a central role as a provider of the lost ideal of a "liberal educa-
tion."

7. Clear Vision and Articulation of Interdisciplinary Studies

Clear vision and ongoing articulation of what the interdisciplinary initia-
tive is all about is necessary for all participants (students, faculty, adminis-
trators, funding sources, program reviewers, etc.) that can be supported by
specific data (quality of students admitted to such programs, successful
completion rate, good GPAs, reasonable time-to-degree, tracking of gradu-
ates, etc.).

As many respondents commented, this idea is impossible to oppose. Ar-
ticulating a vision goes to the heart of the process of establishing interdisci-
plinary studies' function in higher education, and clarifying its aims and as-
pirations. Interdisciplinarity has been questioned and sometimes denigrated
as a vague and watered-down educational philosophy and is often inadequately
understood. A clear vision is necessary in order to defend, illuminate, and
justify interdisciplinarity as a valid academic undertaking. However, because
interdisciplinary studies embraces ambiguity, no single vision can ever be
applied to all interdisciplinary studies programs for all time. This ambiguity
is part of what separates interdisciplinarity from the disciplines, and it is a
vital component of its vision. Like all of the other aspects of interdisciplinary
endeavor, the vision and articulation of interdisciplinary studies are a per-
petual process of synthesis. As paradoxical as it may sound, part of the vision
of interdisciplinarity consists of avoiding the establishment of a vision which
is so definitive that it becomes static. The craft of interdisciplinarity is wo-
ven, not etched in stone.

Program Delivery

One idea, relating to funding and which was applied only to the graduate
level, achieved consensus in this area of inquiry. Several others came close;
yet, because this area is fairly young and still in the experimental stages,

there was reticence among some members of the sample to make alternative learning a part of the interdisciplinary initiative.

1. Funding for Study Outside the University

Interdisciplinary studies programs should be given a level of funding for study abroad, field study, and conference attendance, etc., commensurate with other programs and departments. Because the practice of interdisciplinarity necessitates breadth of knowledge and expansive inter-communication within a field which essentially knows no boundaries, the avenues for exploration must be kept perpetually open.

Some respondents commented that this idea was stated too broadly. However, the need for graduate students to expand their learning beyond the classroom was generally accepted. Additionally, because interdisciplinary study is often on the forefront of innovation in instructional techniques and program delivery, it is in a position to advocate for alternative learning opportunities for graduate students.

Closing Remarks

In conclusion, I would like to express some of my own personal and general reflections about interdisciplinarity that this study engendered. First of all, I believe that this conflict between structure and liberty in interdisciplinary studies is unnecessary. This dichotomy has been described in classical terms as an opposition between Apollonian and Dionysian schools of thought. Perhaps the best way to define interdisciplinary studies is as a field. To extend the metaphor to its pastoral extremity: within this field can coexist a number of differing environments. One can have the open meadow, where, on the periphery, there is freedom to explore knowledge unfettered by methodological precedent, the space to invite epiphany, to investigate the frontier. Trow (1998) describes the joy of interdisciplinary studies as "the sheer pleasure in the intellectual play that [interdisciplinary studies] afford to students and teachers alike, the pleasures of roaming across disciplinary boundaries and of finding connections and links, illuminations and insights in the ideas and discoveries of disparate disciplines" (p. 181).

To continue the metaphor: at its center, there exists a stable edifice. This is surrounded by gardens, crops, mines, or windmills where more structured inquiries are undertaken. Yet that edifice in the center, the core of interdisciplinarity, is solid and secure, while being constantly under recon-

struction, as the inhabitants of this field come and go, depositing new ideas, ever accruing and synthesizing. What differentiates interdisciplinary studies from the established disciplines is that it is an organism, and an organism, along with possessing an inherent structure, is dependent upon ongoing synthesis in order to adapt and survive. It must rectify contradictions; continually explore, assess, and manage changing conditions; maintain internal and external harmony and cohesion; and synchronize all these things into a system which can sustain consistency and equilibrium over time. Thus, it naturally has both Apollonian and Dionysian characteristics. Interdisciplinarity has the advantage of being compelled by its very constitution to take this organic approach from the onset, thus aiding in the evolution of how we conceptualize and apply knowledge.

Secondly, I believe that interdisciplinarity is a very ordinary occurrence. In everyday human activity—whether discussing current events at the proverbial water cooler; making budget decisions; or deciding whom to vote for, what job to take, how to conduct interpersonal relationships, how to educate children, when and where to go to war, what church to attend (or not), what neighborhood to live within, where to shop and what to shop for, what books to read or events to attend, what to eat, where to sleep, where to go— what to do with one's life—human beings, by nature, assimilate a multiplicity of perspectives and methods all the time. It is the way our minds are designed. Our brains are not definitively categorized, and neither is any other system we find in nature, from the microscopic to the macrocosmic. Even Aristotle himself, perhaps the seminal force behind the establishment of the disciplines, felt that a truly educated person was someone who possessed a breadth of knowledge which he or she was able to integrate into a whole of understanding (1952, p. 161). The interdisciplinary perspective is simply a refinement of what we all do every day as we assimilate life and develop strategies for adaptation. Nature itself, including necessarily one's own human nature, is interdisciplinary. For college students, especially those beginning their higher education, interdisciplinarity should not be viewed as an esoteric educational philosophy, but as a formulation of the critical thinking skills they already use and should continue to cultivate and perfect.

Lastly, if I may return to my esoteric roots to observe: Interdisciplinarity is rediscovering what we have all known since our species developed consciousness—that is, all knowledge is interrelated. All phenomena are interconnected, including our own minds. Anyone who has explored nature in any number of its facets quickly comes to realize that there are recurring, underlying patterns illuminated across the spectrum of natural phenomena which make the

universe both cohesive and intelligible and eventually perhaps generalizable. Such a notion need not be overly metaphysical. It is fairly apparent that all things are intrinsically integrated; they are able to interact because they share a common nature. This idea, which was formulated by the ancient philosophers, refined over the ages through renaissances and revolutions, and dismissed under the dominion of specialization, now comes full circle once again. Integration is not something interdisciplinarity constructs; it is something it uncovers.

In order to survive, our civilization, as a collective organism, must excel at integration, assimilation, and adaptation—just like any other product of evolution. Interdisciplinarity, as an organism grappling to manage myriad inputs and impulses, can provide an example and a methodology for how to regain holism from seemingly disparate divisions and revision the way we apply and conceive of knowledge. Interdisciplinarity serves as a loom which brings the multi-faceted threads of nature and culture together in a coherent form, rather than as a scalpel with which these facets are to be severed asunder. As for myself, I will settle for a decent working knowledge of the universe, and interdisciplinary study is a good vehicle for that as well.

Biographical Note: James Welch IV is a Lecturer in the Interdisciplinary Studies program at the University of Texas at Arlington. He has a Master of Arts degree in Interdisciplinary Studies from Texas State University and is currently beginning doctoral studies in the Humanities (History of Ideas) program at the University of Texas at Dallas, where he hopes to pursue that rumored chimerical beast: the ideal of the adept interdisciplinarian.

Notes

1. This document is available at: http://homepage.mac.com/jlfwiv/
2. The Delphi Questionnaires used in the study are far too lengthy to be included in this article, but they are available in the final report referenced above.

References

Adams, S.J. (2001, October). "Projecting the Next Decade in Safety Management: A Delphi Technique Study." *Professional Safety,* 26-29.
Aristotle (1952). "On the Parts of Animals." In R.M. Hutchin (Ed.), *Great Books of the Western World,* 9, pp. 161-229. Chicago: Encyclopedia Britannica.
Armstrong, F.H. (1998). "Faculty Development through Interdisciplinarity." In

W.H. Newell (Ed.), *Interdisciplinarity: Essays from the Literature* (pp. 171-180). New York: College Entrance Examination Board.

Association for Integrative Studies Task Force (2000). *Accreditation Standards for Interdisciplinary General Education.* Retrieved March 22, 2004 from http://www.units.muohio.edu/aisorg/pubs/reports/genedaccred.html.

Benson, T.C. (1982). "Five Arguments Against Interdisciplinary Studies." In W. H. Newell (Ed.), *Interdisciplinarity: Essays from the Literature* (pp. 103-108). New York: College Entrance Examination Board.

Dalkey, N.C., Rourke, D.L., Lewis, R. & Snyder, D. (1972). *Studies in the Quality of Life.* Lexington, MA: Lexington Books.

Enzer, S., Boucher, W.I. & Lazer, F.D. (1971). *Futures Research as an Aid to Government Planning in Canada: Four Workshop Demonstrations.* Middletown, CT: Institute for the Future.

Friedman, S.S. (2001). "Academic Feminism and Interdisciplinarity." *Feminist Studies,* 27(2), 504-509.

Giri, A.K. (2002). "The Calling of a Creative Transdisciplinarity." *Futures,* 34(1), 103-116.

Gordon, T.J. (1971). *Current Methods of Futures Research.* Menlo Park, CA: Institute for the Future.

Hewitt, N. & Lanser, S. (1998). "Disciplining Feminism? The Future of Women's Studies." *Feminist Studies,* 24(2), 235-427.

Hursh, B., Haas, P. & Moore, M. (1998). "An Interdisciplinary Model to Implement General Education." In W.H. Newell (Ed.), *Interdisciplinarity: Essays from the Literature* (pp. 35-49). New York: College Entrance Examination Board.

Katz, C. (2001). "Disciplining Interdisciplinarity." *Feminist Studies, 27(2),* 519-525.

Klein, J.T. & Newell, W.H. (1998). "Advancing Interdisciplinary Studies." In W.H. Newell (Ed.), *Interdisciplinarity: Essays from the Literature* (pp. 3-22). New York: College Entrance Examination Board.

National Center for Educational Statistics. (2003). *The Condition of Education 2003*. Washington DC, Department of Education, Institute of Education Sciences.

Newbould, P.J. (1975). "Environmental Science at the New University of Ulcaster." *Case Studies in Interdisciplinarity*, (pp. 3-6). London: The Nuffield Foundation.

Newell, W.H. (1998). "Professionalizing Interdisciplinarity, Literature Review and Research Agenda." In W. H. Newell (Ed.), *Interdisciplinarity: Essays from the Literature* (pp. 529-563). New York: College Entrance Examination Board.

Newell, W. & Green, W. (1998). "Defining and Teaching Interdisciplinary Studies." In W.H. Newell (Ed.), *Interdisciplinarity: Essays from the Literature* (pp. 23-34). New York: College Entrance Examination Board.

Strauss, H.J. & Zeigler, L.H. (1975). "The Delphi Technique and its Uses in Social Science Research." *Journal of Creative Behavior,* 9, 253-259.

Sackman, H. (1974, April). *Delphi Assessment; Expert Opinion, Forecasting, and Group Process.* R-1283-PR. Santa Monica: RAND Corporation.

Swoboda, W.W. (1979). "Disciplines and Interdisciplinarity: A Historical Perspective." In J.J. Kockelmans (Ed*.), Interdisciplinarity and Higher Education* (pp. 49-92). University Park, PA: The Pennsylvania State University Press.

Trow, M. (1998). 'Interdisciplinary Studies as a Counter Culture: Problem of Birth, Growth and Survival." In W.H. Newell (Ed.), *Interdisciplinarity: Essays from the Literature* (pp. 181-194). New York: College Entrance Examination Board.

West, G.R. (1999). "Faculty Renewal through Interdisciplinary Collaboration." *JOPERD-The Journal of Physical Education, Recreation, and Dance,* 70(2), 84-85.