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American Association of Colleges Project on
LIBERAL EDUCATION, STUDY IN DEPTH, AND THE ARTS AND SCIENCES MAJOR

**SVHE TASK FORCE REPORT ON
INTERDISCIPLINARY STUDIES**

This report was completed in cooperation with a national review of arts and sciences majors initiated by the Association of American Colleges as part of its continuing commitment to advance and strengthen undergraduate liberal learning. The Society for Values in Higher Education (SVHE) was one of twelve learned societies contributing to this review. Each participating learned society convened a task force charged to address a common set of questions about purposes and practices in liberal arts majors; individual task forces further explored issues important in their particular fields.

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In 1991, the Association of American Colleges will publish a single volume edition of all twelve learned society reports with a companion volume containing a separate report on "Liberal Learning and Arts and Sciences Majors." Inquiries about these two publications may be sent to: Reports on the Arts and Sciences Major, Box R, Association of American Colleges, 1818 R Street, NW, WASHINGTON DC 20009.

An expanded version of this report on Interdisciplinary Studies provides additional bibliography, and essays on interdisciplinary teaching, curriculum development, and administration. It appears as a special issue of the journal *Issues in Integrative Studies* (8, 1990). Edited by Julie Thompson Klein and William G. Doty, and entitled **INTERDISCIPLINARY RESOURCES**, it is available from the Secretary-Treasurer of the Association for Integrative Studies: Professor William Newell, School of Interdisciplinary Studies, Miami University, OXFORD OH 45056. [June 1990; r5]

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Preface

This report was commissioned through the Association of American Colleges as part of a national effort to examine arts and sciences majors offered in American colleges and universities. We examine dimensions of strong interdisciplinary studies (IDS) majors and other aspects of IDS programs (minors, campus-wide programs, courses). We provide a framework for self-evaluation and planning by those responsible for interdisciplinary concentrations as well as by institutional leaders whose support is necessary in terms of resources and political encouragement if IDS programs are to fulfill the expectations that students and faculty hold of them.

The Charge of the national study challenged the task forces to look at the intellectual rationale, organizing principles, and cognitive practices of particular fields of study. We address these issues in addition to making observations and recommendations that concern not only the shaping of an undergraduate major, but the entire campus whose intellectual life IDS programs can stimulate. Unlike most of its companion reports, ours focuses not on a particular discipline or profession or subject matter, but on the growing and multi-faceted phenomenon of IDS majors and minors and courses now offered in almost every postsecondary setting.

The strength of any IDS program is strongly influenced by its institutional setting and support, including support for faculty commitment, and our report addresses institutional issues more extensively than the other task forces found necessary in discussing more traditional majors. Furthermore we found that IDS programs usually have a service function to the entire campus that extends well beyond provision of an academic concentration, and we have sought to address this larger campus-wide service as well. Part of such service today is challenging the values and practices of existing curricular structures and faculty research patterns driven by the strict disciplinary defines of the professions; for that reason, also, we have addressed the entire academy rather than restricting ourselves to the IDS major.

A brief historical overview of the origins and development of interdisciplinary research and education appears in Appendix B of this Report. Section 8 of this Report, entitled Resources, indicates sources of more detailed information.

1. THE URGENCY AND DIVERSITY OF INTERDISCIPLINARY PERSPECTIVES

Although educational institutions only devised academic disciplines and professional specializations early in this century, a sense of urgency about the need for interdisciplinary perspectives has developed during the past few decades. There are many reasons, with the most most global embodied in various forms of the observation that "Real life, we need to remember, is interdisciplinary."¹ Of course "real life" has always been interdisciplinary. But in the late 19th and early 20th centuries, scholars were persuaded that the development of deliberately self-restrictive disciplinary methods and subject matter offered a powerful mode of analysis that would yield not only new insights but a scientific understanding of nature, society, and even culture. College majors in the arts and sciences emerged from this era of disciplinary commitment and expectant scientific optimism.

Now, about a century later, many scholars question this earlier view of the power and reach of disciplinary inquiry. They observe that too often monodisciplinary approaches have produced masses of uninterpreted data that are not helpful in the absence of interpretative, interdisciplinary integration. Actual real-world analysis and problem-solving increasingly require collaborative teamwork that brings together several perspectives, disciplines, and specializations, and seeks to synthesize them for comprehensive analysis and problem resolution.

Such a new practical and intellectual ethos has led in turn to a striking growth of interdisciplinarity: many structures within the academy, and a large proportion of research at the frontiers of the modern disciplines, are now fully and inescapably interdisciplinary. Examples include subjects such as biochemistry, molecular biology, and plate tectonics, as well as the social, linguistic, rhetorical, and textual "turns" that are transforming relations among anthropology and literary theory, history and sociology. Interdisciplinary contributions to the traditional academic departments/disciplines have led several national professional societies to sponsor interdisciplinary sub-units and programs expressly designed to further integration and synthesis among several professional specialties.

Such revised conceptions of scholarship and research, and the accompanying new pedagogies and epistemologies have contributed to the remarkable growth of academic IDS programs in colleges and universities across the nation. Today IDS majors, minors, programs, concentrations, and even single IDS courses offer a form of learning that is increasingly sought after and valued. Faculty, students, and academic administrators perceive IDS as an important resource for overcoming the intellectual constraints imposed by traditional discipline-bound divisions, and for practical integration of knowledge derived from disparate contexts and sources.

The development of vigorous IDS programs provides a campus-wide climate of shared discourse and intellectual interaction in which faculty have the opportunity to expand and extend their own training and research-applications. In turn, students become involved in instructional contexts and collaborations that prepare them to graduate into our increasingly diverse and culturally-complex world, a world in which political polarizations are becoming more rather than less extreme and in which the ability to analyze and evaluate competing opinions sensitively and fairly is increasingly important.

Not surprisingly, then, IDS enrollments have increased exponentially, and IDS assumes many forms reflecting the variety of institutional shapes of American college and university campuses. On many campuses, interdisciplinary education provides a framework for a general education or core curriculum, but its forms across these campuses are actually quite manifold. More detailed examples appear in Appendix C, but the major forms include:

- interdisciplinary colleges and universities

¹ The Project on Redefining the Meaning and Purpose of Baccalaureate Degrees, *Integrity in the College Curriculum: A Report to the Academic Community*. Washington: Association of American Colleges, 1985; p. 30.

- interdisciplinary training and continuing education in research centers and institutes
- undergraduate major and minor programs of study in the liberal arts tradition, more specialized areas, and regional studies
- graduate programs in a variety of fields
- cluster courses of a multi- or inter-disciplinary nature
- general education or "core" curricula and honors programs
- academic opportunities for independent study and adult degree programs
- single courses within disciplinary and professional contexts
- courses and programs centered on praxis, such as internships and fieldwork, travel- and work-study, and problem-oriented research teams.

Within such a broad range of programs there is no one "typical" interdisciplinary student, although Appendix C concludes with some representative student profiles. In a growing number of U.S. universities and colleges, students choose interdisciplinary options for satisfying general education requirements, although undergraduate interdisciplinary majors may also pursue more specialized programs, including:

- cybernetic systems
- human services
- regional and ethnic studies
- environmental studies
- human development
- American studies
- cultural studies
- science, technology, and society.
- urban studies
- multicultural education
- border studies
- human ecology
- materials science
- women's studies
- cognition

IDS today reflects an enormous variety of local administrative, pedagogical, social, and cognitive differences, but there are some common structural elements and patterns.² We highlight three basic organizational structures in which the IDS major is likely to be situated:

1. *Established programs*, with permanent staff and program budgets. They often act like other campus departments, have a capstone course, or even an established sequence of courses, and function across a large part of the university (for example, the Eugene Lang College at the New School for Social Research, and the State University of New York/College at Old Westbury).
2. *Interdepartmental committees, programs, or colleges* with independently defined curriculum or degree requirements but no faculty appointed solely by the unit. Such a unit is sometimes called a "cluster program"; it depends upon other institutional units for its existence, although it may have considerable administrative autonomy.

² William Mayville names three significant program models: revolutionary models designed to dispense with the traditional disciplinary apparatus; professional models designed to train specialists by using an interdisciplinary format that acquaints them with the broader and often ethical or social consequences of their chosen profession; and programmatic models designed to broaden the cultural and intellectual frameworks of students. See his *Interdisciplinarity: The Mutable Paradigm* (Washington DC: American Association for Higher Education, 1978; AAHE-ERIC Higher Education Research Report, No. 9), p. 31. One or another of these models may be predominant in any given situation, and we have not argued here that one of the three is better than another. They are helpful models for understanding why there is such a range of types of IDS programs and majors.

3. *Individually-designed majors* or other programs and administrative arrangements wherein students or faculty design degree programs on a year-to-year or ad hoc basis. Many campuses provide this option for a small number of student-designed minors or majors at undergraduate and graduate levels. Structures may be differentiated yet further in terms of their individual institutional contexts, which range from large public institutions in which research expectations determine standards of promotion and tenure, to small liberal arts schools where teaching is more prominent in the reward system and where a distinct interdisciplinary milieu prevails across the campus.

2. THE INTERDISCIPLINARY LIBERAL ARTS AND SCIENCES: CRITICAL INTELLIGENCE, SYNTHESIS, AND DEPTH

Whether or not they are structured into major/minor requirements, a series of IDS courses represents superior preparation for contributions to society by liberally educated college graduates. The Task Force heard repeatedly of the need for employee flexibility to retrain for new and unanticipated applications of knowledge and synthesizing skills, and we were struck by the fact that in well-designed IDS programs, students do indeed learn how to integrate creatively a wide range of information. Certainly the link between IDS and liberal learning is apparent in the disciplined interconnection of intellectual coherence and skills acquisition that marks critical intelligence, creativity, and synthesis.

The metaphor of "depth," as a widely used goal for study in the traditional majors, implies the deepening of knowledge along a vertical axis, and presumes that interdisciplinarity lies along the horizontal axis of "breadth." But the depth vs. breadth dichotomy fails to acknowledge the essential third step of *synthesis*. Thus in IDS, as in an increasing number of traditional majors, the call for "depth" cannot mean merely coverage of one or more disciplines or the mastery of a canon of facts and data.

We prefer to argue that the ideal IDS graduate will demonstrate intellectual facility having depth, breadth, and synthesis. By *depth* we mean having the necessary technical information about, and the methodologies necessary for, analysis of a given problem. Students should know how to master the complexities involved in obtaining germane research findings, and be aware of the methodologies of the disciplinary contexts in which such information is generated. By *breadth* we mean exposing students to a wide knowledge base and training them to organize information in order to make generalizations from particular cases. By *synthesis* we mean being able to apply integrative skills in order to differentiate and compare different disciplinary perspectives; to clarify how those perspectives relate to the core problem or question; and to devise a resolution based upon the holistic interaction of the various factors and forces involved.

Such skills are fundamental to any IDS major or course, the academic integrity of which depends upon clearly defined intellectual abilities and integrative skills. Critical intelligence depends upon utilizing competencies that are typical of IDS approaches:

- analyzing and defining problems
- generalizing from particular cases and awareness of generic patterns
- seeing similarities and differences in situations constructively discerned
- responding flexibly to new ideas and situations
- making sense of ambiguity and contradiction and appreciating that they may not always be reducible
- developing a critical perspective by taking several sides into consideration before arriving at a rigorously reasoned synthesis.

Acquisition of these integrative competencies will insure that IDS graduates are able to deal in an informed fashion with ambiguity and paradox; to outline creatively possible alternative solutions and options while making comparisons with ethical awareness and sensitivity; and to arrive at a carefully reasoned synthesis.

Unfortunately faculty teaching many existing "interdisciplinary" courses have not developed clearly defined interdisciplinary core skills, and have paid inadequate attention to the integrative process. Too often IDS programs are merely *additive* multidisciplinary collections of different perspectives. But inter-

disciplinary synthesis is achieved not by arraying disparate subjects sequentially but by strenuous methodological and conceptual work. Therefore faculty responsible for IDS must pay attention to curricular design and actual teaching praxis by considering the following questions:

- How does the major, program, or course bring the techniques and perspectives of several disciplines to bear upon a problem or question? Is the problem or question carefully defined?
- Are students helped to understand self-consciously how the various elements in integrative synthesis are obtained, and how they interrelate?
- How and when does a comparative analysis of pertinent disciplinary methods and tools take place? Are there occasions for indicating to students where various types of information can be obtained, including on-line databanks?
- Are the goals of both specific intellectual and disciplinary depth and broad interdisciplinary synthesis explicitly defined and pursued?³
- Has the faculty considered the danger that fully-integrative synthesis may be hindered by the lack of a particular disciplinary contribution that should be added to the IDS program's offerings?

3. STRUCTURE AND SEQUENCE

Local resources and design lead to a wide range of IDS majors, as we have noted. The content and structure, and to a large extent the actual sequencing of majors depend upon the size of the IDS program as well as their focus in fields such as various as women's studies, environmental or urban studies, cybernetic systems, materials science, or Renaissance studies. We found that individual courses and clusters of courses are most frequently integrated around a theme, topic, or issue; a question or problem; an author, historical period, historical figure, region or nation, or institution; or a particular interdisciplinary field of study or set of integrative methods or concepts.

Since there is such a wide variety of program structure, we cannot stipulate a normative IDS program curriculum or sequence of courses but can only describe here some of the variety. Most interdisciplinary majors rely upon a two-part sequence consisting of lower-level study of the humanities, social sciences, and science and technology, usually conceived as an additive experience of gaining breadth, followed by upper-level capstone work, usually an integrative seminar and/or senior essay or project. Intermediate (junior level) and capstone (junior and senior level) seminars are the most powerful vehicles for increasing critical and methodological sophistication, and must be considered a *sine qua non* for an adequate interdisciplinary curriculum.

Such seminars allow students to synthesize the various parts of courses, to explore the relationship between various disciplinary perspectives, to explore the ethical and praxis-oriented dimensions of disciplinary work, and to reflect on how disciplinary relations have changed historically. At the same time, synthesis can be promoted across the curriculum through good practices we surveyed:

- in-depth first-year seminars that provide comprehensive orientation to the nature of interdisciplinary study while probing a single field, issue, problem, or question
- advanced seminars that function as integrative capstone courses in which analytical and critical methodologies are refined
- courses focused upon second-order reflections on research methods and upon the immediate course work
- capstone essays and projects

³ See Ernest Lynton, "Interdisciplinarity: Rationales and Criteria of Assessment," in Lennart Levin and Ingemar Lind, eds., *Inter-Disciplinarity Revisited: Re-Assessing the Concept in the Light of Institutional Experience* (Stockholm: Org. for Econ. Co-operation and Devel., Swedish Nat'l. Board of Univ. and Coll., and Linköping University, 1985), pp. 137-52, at p. 149.

- academic-career portfolios in which students maintain a record of contracts, documented work, and evaluations of their course work, with reflection on interrelationships of the intellectual parts
- the use of common living arrangements and shared facilities and equipment
- fieldwork, work-experience, and travel-study settings
- unique courses focused proactively on integrative theories, concepts, and methods
- co-ordinated alignment of parallel disciplinary courses, particularly when accompanied by a formal or informal integrative seminar or discussion group
- use of particular integrative strategies, such as systems theory, feminist theory, Marxism, etc.
- the clustering of separate disciplinary courses around a common integrative seminar, as at Dominican College in California, and in the Federated Learning Communities at SUNY/Stony Brook.

Sequencing must take carefully into account the increasingly-diverse makeup of the student body. No IDS major ought to be locked-in in such a manner that a program cannot be adjusted for the specific qualifications, needs, and interests of particular students. Since on a particular campus the IDS curriculum will frequently provide the greatest amount of student freedom to shape a program of studies in a manner that recognizes former-learning experiences, IDS programs must be designed to be as flexible as possible, while holding at the same time to a disciplined emphasis upon the integrative core of the programs.

Obviously counseling is an important component in balancing the need for disciplined focus upon analysis and integration with the need to adjust sequencing of courses to the interests and experience of returning adults and transfer students. What we found repeatedly was that such balancing was happening, and that IDS programs provide an important venue in the academy for the "unusual" student (who today is becoming the "usual" student in many urban settings--the returning older student, the transfer student, or persons who chose their major program late in their academic careers).

Several IDS majors may serve as exemplary models with respect to sequencing: The curriculum of the Department of Human Development at the University of California/Hayward begins with an initial meeting in which students identify their educational needs and the possibilities of meeting them within the program. The junior level core consists of a series of twelve complementary and contrasting modular courses that represent different approaches to human development. Students also have opportunities to appraise their progress in small group meetings, and their work culminates in a senior level seminar and essay or project.

The core sequence in Earlham College's Human Development and Social Relations Program, a two-term sequence in psychology and social anthropology, introduces the major theoretical paradigms, methodological strategies, and bodies of empirical data in academic disciplines related to particular problem areas. Los Medanos College, a community college in California, has a three-tiered interdisciplinary general education program featuring interdisciplinary courses focused upon social and humanistic issues. The first tier is more encyclopedic in nature; the remaining tiers focus upon integrating concepts and establishing the process of ethical decision-making.

The University of Alabama's interdisciplinary program in Women's Studies introductory courses provide a "sample"; other courses bridge two disciplines, such as psychology and sociology of the family; and an integrative seminar focuses upon gender, race, and class. At Shimer College, a four-year liberal arts college in Illinois based on small classes and "great books," students move from associative generalizations at the basic level to a more rigorous study of interrelationships among the modes and methods of inquiry within various disciplines, then ultimately to synthesis. The Tier II Synthesis developed at Ohio University involves seniors in the final integrative stage of a comprehensive general education program. It stresses the development of a capacity for synthesis, defined as bringing together two or more disciplines to yield patterns or corresponding ideas.

With respect to instructional modes, we found repeatedly that IDS programs are important on-campus sites for pedagogical experimentation and change. In many cases learner-oriented communities facilitate interaction and integration through small-group work, individualized and self-directed learning, and fieldwork

and other applied experiences. On other campuses we found dialogical models of the educational process, active involvement of teachers as co-learners, collective problem-solving, special ways of clustering courses, and opportunities for collaborative research with faculty. In fact campus renewal and experimentation in pedagogy are taking place in many campus IDS programs where it is clear that they represent some of the most potent possible resources for the revitalization of academic instruction.

4. CAMPUS-WIDE ASPECTS OF IDS

A change-agent for overall enrichment of academic quality across the entire college, IDS programs can contribute a reference base of ideas and concepts that generates a common discourse on campus, liberally educating faculty and students alike by exposing them to crucial literature and experiments, significant artistic expressions, and modes of analytical comparison and criticism. Presentations, conferences, and programs offered to the entire campus draw well, since IDS sponsors are recognized for their ability to integrate diverse knowledge and to refine effective new approaches to scholarship. IDS programs and centers offer exceptional resources for non-classroom and campus- and region-wide conferencing, teleconferencing, and workshops and colloquia of importance across academic and professional communities. (Such resources should be accessible to non-IDS majors so that they can integrate them into their existing disciplinary requirements.)

A number of IDS majors serve multiple functions within their parent institutions. At St. Olaf College (Minnesota) students in the interdisciplinary Paracollege take regular college classes, and satisfy the same general proficiencies as other students; regular students, in turn, can take several Paracollege seminars and workshops, or transfer in for a one-semester *Paraloop*. The Hutchins School of Liberal Studies at Sonoma State University (California) offers an interdisciplinary major in liberal arts and a minor in integrative studies as well as serving as an alternative general education program for lower division students. The School of Interdisciplinary Studies at Miami University (Ohio) is integrated into the larger university curriculum in the sense that students take a substantial part of their upper level course work outside the program itself, but in parallel with special seminars and a senior essay or project within the School itself.

Interdisciplinary programs can allow a college to meet student needs quickly and flexibly when a major political change or technological innovation suddenly modifies what a large of students need to study. Courses not likely to be fully subscribed within one department or school, yet of importance to a wide range of students, can be supported. Short academic terms (such as interim terms in January or May, or summer semesters) also permit interdisciplinary additions to the overall curriculum that involve faculty or off-campus instructors not available during the fall/spring academic year.

An IDS program center, advising office, or library/lounge area can ground the identity of the IDS major in a physical place while facilitating collegial dialogue. Such a center can provide also provide important employment information. Jobs that make extensive use of IDS perspectives are not always so advertised, and part of the IDS program design should involve helping prospective graduates to identify likely options as well as contacts with previous graduates who will have networking possibilities.

5. FACULTY IN IDS

Often the sign of an effective IDS major can be identified by faculty commitment to, and administrative support for, regular on-going faculty-to-faculty and faculty-to-student interaction outside the classroom. We found repeatedly that the best programs featured the development of learner-oriented communities whose bounds went far beyond the walls of the classrooms, but often included an informal campus IDS center on campus. Discussion groups, workshops, and conferences held in conjunction with IDS programs offer powerful opportunities for cross-campus dialogue and on-going faculty development; sometimes such special programs are what both faculty and students remember the most about IDS involvement. Likewise, faculty members frequently speak of returning to more traditional disciplinary teaching with revitalized teaching interests.

A faculty member interested in teaching IDS courses is not automatically prepared to do so. While most IDS programs involve extensive faculty participation in their planning and design, preparation for interdisciplinary teaching itself is often limited to a preliminary orientation, a workshop, or sitting in on a course the semester before assuming the instructional mantle. In most cases there is little use of the now extensive IDS literature, and as a result a teacher's graduate-school *disciplinary* training, rather than interdisciplinarity, may predominate in the actual classroom exchange. Programs should insist that instructors have at least some acquaintance with the academic literature on interdisciplinarity and IDS, and should provide workshops for training new faculty and advancing the interdisciplinary skills of existing faculty. (For access to some of the most useful materials, see Section 8, "Resources.")

Faculty will be more inclined to participate in IDS if they know that their institution rewards such efforts when awarding tenure, promotion, and salary increments. Although official institutional statements frequently promote undergraduate teaching and interdisciplinary work, the realities often belie the promotional rhetoric. Several of the programs reviewed by the Task Force lack a healthy mixture of younger and older faculty because younger faculty pursue interdisciplinary teaching only at a real risk to their academic careers. Yet apart from service on a few cross-campus committees or projects, IDS teaching may be one of the few truly co-operative enterprises in which contemporary faculty may be engaged.

6. ASSESSMENT

While well-known national instruments claim to be appropriate for assessing IDS, most assess the liberal arts tradition broadly-conceived, or focus entirely upon specific details of disciplinary knowledge rather than upon the relationships among depth, breadth, and synthesis. They seldom take into account the fact that many IDS programs and courses are rooted in particular clusters of disciplines, and hence they are insensitive to the *particular* needs of many IDS curricula.

Obviously assessment should not just mean testing or questionnaires. Informal critical-incident and qualitative assessment approaches, including in-depth interviews with both present and former students, are more likely to produce usable evaluative information than questionnaires administered without regard for the program context or distinctiveness. Any instrument or set of assessment strategies devised for IDS should focus upon the care and rigor with which students' integration and application of knowledge are developed throughout the program. It should include evaluation of the usefulness of the academic degree to graduate programs and to a wide range of employers.⁴

Beyond careful attention to the integrative process itself, any assessment strategy should highlight as well:

- *personnel* (Who has been teaching repeatedly? Who might be added or placed in rotation?)
- *tracking procedures* (Who advises? Who helps the student keep clear records of progress expected? What post-baccalaureate tracking is done?)
- *transcript patterns within the IDS program* (How different are the closest parallels in the traditional disciplinary majors? What seems to be unique about patterns in the IDS courses elected?)
- *developmental issues* (When are specific competencies such as evaluation, analysis, and integration most likely to be produced? Is there evidence from student work that these competencies are in fact developed?)
- *general education issues* (How do IDS students compare with others in terms of writing across the curriculum? Are objectives clearly defined in classes? Are they actually achieved? Are courses incorporating contents and goals of the campus general education design? Has the IDS faculty considered how it can offer course courses in areas wherein its members have unique experience and expertise?)

⁴ See further Lynton, "Interdisciplinarity."

- *teaching effectiveness* (In what ways are student and peer evaluations shared usefully with instructors? When are workshops on effective IDS teaching most likely to be helpful?)

In conducting assessment, evaluators should be alert to unique problems:

a) *at the level of faculty:*

Younger faculty—who may be the best equipped to venture into new areas—may fear evaluation from persons whose skills or sympathies do not lie within interdisciplinary work. We observed repeated cases in which publications in refereed interdisciplinary journals were disallowed or discounted in favor of more traditional disciplinary publications. In other cases, student evaluations were critical sources of assessment for IDS faculty, and in some institutions, were weighted more heavily than those of faculty peers.

b) *at the level of students:*

Periodic reviews of student performance as a whole, and exit reviews of individual graduating students, can provide useful self-criticism and reassessment. Student feedback with respect to the planning and methodologies of teaching and presentation of their own and faculty research is crucial if IDS students are to learn to own their education. Establishing on-going tracking of recent graduates can also provide important nurturing of one another and assisting new graduates in finding employment opportunities.

c) *at the level of the program:*

Programs that do not incorporate frequent student feedback and administrator/faculty reviews are not likely to succeed. Periodic reviews at least every five years ought to provide information for administrative support of the program and for negotiations with the campus-wide curriculum/instruction committee that reviews degree requirements and approves new courses. Persons outside the program, and from off campus, ought to have a voice in evaluating IDS programs. Retrospective reviews by alums as well as follow-up of graduates should be built in, and reviews of course textbooks and syllabi should be undertaken by both faculty and students.

Assessment provides a means of remaining alert to the fixity that would limit the flexibility toward disciplinary boundaries that has often been the rationale for beginning IDS programs. And assessment ought to be broadly enough conceived that it looks both inward, toward the performance of the IDS program, and outward, toward analysis of the society's present and future needs. When designed correctly, external and internal evaluation can provide an important feed-back mechanism for all those concerned with IDS.

7. RECOMMENDATIONS

Despite the growing attractiveness of IDS approaches in research and education, we found a widespread lack of institutional financing and administrative support for sustaining them. On the basis of our reviews of programs and our consultations with interdisciplinary educators, we list here actions that can be taken to advocate IDS within institutions of higher education and to insure the quality of offerings:

a) *Recommendations to IDS program directors and faculty:*

1. IDS programs should insist upon formal preparation of instructors working in the field, and encourage on-going re-evaluation of the common IDS enterprise.
2. We recognize the wide variety of existing structures of IDS programs and hence the inappropriateness of our recommending a particular sequence of courses for all majors. However we do recommend that any IDS program or major be carefully planned by faculty and administrators with a view toward balancing depth, breadth, and synthesis, as discussed above. Whatever sequence is stipulated must be conveyed clearly and repeatedly to both students and faculty, and possibilities for exceptions spelled out carefully. Wherever possible an ombudsperson should be available for both students and faculty.
3. Regular review of IDS aims and program procedures must be held to insure that instruction is truly integrative and not merely additive, and that student performance is being improved consistently.

b) *Recommendations to academic administrators and faculty*

Curriculum Committees:

4. Attractive faculty-development programs, seminars, and institutes originating in IDS contexts should be integrated into campus-wide academic planning, activities, and funding.
5. Administrative structures must:
 - provide secure budgetary lines in hard money
 - seek funding for IDS public/community programming
 - perform periodic re-examination of the entire university curriculum to assure that existing structures respond adequately to the needs of contemporary society and research communities
 - insure that there are no penalties for engaging in IDS research or teaching, and provide safeguards for faculty who teach in both an IDS program and a specific discipline: contracts or letters of agreement should stipulate precisely how the IDS teaching or administration is to be ranked in tenure, promotion, and salary considerations.
6. Administrators should assist IDS program directors' access to other campus resources, such as community outreach, non-traditional-degree programs, adult degree programs, business-community and education-community groups, international studies, and honors. Such support can sustain efficient utilization of available funds for speakers, workshops, and media resources.
 - c) *Recommendations across the academic campus:*
7. Involvement in and support for national IDS organizations and clearing houses for information is vital: they provide start-up information, good practice examples, bibliography, and knowledgeable and experienced consultants who can help a campus avoid costly mistakes and unnecessary wheel-spinning.
8. Persons concerned about IDS on an individual campus should develop support committees and systems for IDS programs and activities on campus.⁵
9. Campus-wide advisers ought to be kept aware of IDS majors and programs, and asked to help students to learn how to satisfy academic interests and needs that can only be satisfied through IDS courses and programs. Advisers can also help students to identify graduate or professional schools that welcome IDS majors.
10. Everyone involved in IDS must work to see that all granting agencies, national as well as local, do not discriminate against IDS-oriented projects, and to ascertain that the local support for individual and group IDS applications remains as strong as it is for other projects.
11. Library budgets should include provisions for ordering IDS materials that do not fit allocations for the traditional disciplines and departments. A reference bibliographer trained to support interdisciplinary research can be a priceless resource.

8. RESOURCES

The following list of resources provides an introductory orientation to the literature on interdisciplinarity, in general, and on IDS *per se*.

The pioneer work of scholarship is *Interdisciplinarity: Problems of Teaching and Research in Universities* (Paris: Organization for Economic Co-operation and Development, 1972), a work that contains core terminological distinctions. *Integrating Scientific Disciplines*, edited by William Bechtel (Dordrecht: Martinus Nijhoff, 1986), is an important introduction to the interdisciplinary sciences. Raymond C. Miller surveys "Varieties of Interdisciplinary Approaches in the Social Sciences," in *Issues in Integrative Studies* 1 (1982), 1-37, a work to be supplemented by Landau, Proshansky, and Ittelson, "The Interdisciplinary Approach and the Concept of Behavioral Sciences," in Norman Washburne, ed., *Decisions, Values, and Groups* (New York: Pergamon, 1972) vol. II, pp. 7-25. Nancy Anne Cluck offers "Reflections on the Interdisciplinary Approaches to the Humanities" in *Liberal Education* 66/1 (1980), 67-77.

⁵ Seldom do directors of Women's Studies, International Studies, and other IDS programs sit down together to address common problems, issues, and resources, resulting in a further fragmentation of the campus-wide interdisciplinary enterprise.

Much of the interdisciplinary literature is reported in two recent books. Julie Thompson Klein's *Interdisciplinarity: History, Theory, and Practice* (Detroit: Wayne State University Press, 1990) synthesizes modern scholarship on interdisciplinary research, education, and health care; it also includes comprehensive bibliographies on interdisciplinary theory and method, problem-focused research, education, health care, and selected references from the humanities, social sciences, and science and technology. D. E. Chubin et al., eds., *Interdisciplinary Analysis and Research: Theory and Practice of Problem-Focused Research and Development* (Mt Airy MD: Lomond, 1986), anthologizes important essays on interdisciplinary research, and includes an annotated bibliography emphasizing problem-focused research.

Other references focus more fully upon IDS. William H. Newell's *Interdisciplinary Undergraduate Programs: A Directory* (Oxford OH: Association for Integrative Studies, 1986) is the most current compilation. In *Interdisciplinarity: The Mutable Paradigm* (Washington DC: American Association for Higher Education, 1978), William Mayville surveys fundamental definitions, educational models, and model programs. David Halliburton surveys the topic, definitions, types of curriculae, and the value of IDS approaches in "Interdisciplinary Studies," in Arthur Chickering, ed., *The Modern American College* (San Francisco: Jossey Bass, 1981), pp. 453-71. Alvin White edited a collection of reflections on *Interdisciplinary Teaching* (San Francisco: Jossey Bass, 1981), and James Palmer reviewed resources culled from the ERIC database in "Interdisciplinary Studies: An ERIC Review," *Community College Review* 11/1 (1983), 59-64. In addition Hursh, Haas, and Moore provide an important and widely applicable model of interdisciplinary process in "An Interdisciplinary Model to Implement General Education," in the *Journal of Higher Education* 54 (1983), 42-59.

Teachers and administrators should be familiar also with the database of the Educational Resources Information Center (ERIC), sponsored by the US Department of Education. Monthly issues of *Resources in Education* and *Current Index to Journals in Education* can be searched to find in ERIC much of the "buried treasure" in higher education that is otherwise not published.

A number of journals and serials regularly publish interdisciplinary work: *The Association for Integrative Studies Newsletter* and *Issues in Integrative Studies*; *Improving College and Education Teaching*; *Change*; *Soundings: An Interdisciplinary Journal*; *Liberal Education*. A number of organizations serve as professional homes for those interested in interdisciplinary teaching, administration, and research: The Association for Integrative Studies; Association for General and Liberal Studies; The Society for Values in Higher Education; National Collegiate Honors Council; and the National Core Curriculum Association.

APPENDICES

A. TASK FORCE PROCEDURE, DATABASE, CONSULTANTS

The task force included faculty and administrators from a range of academic institutions, private and public, small and large. During the study we had extensive contacts with administrators, faculty, and students, with whom we discussed issues in the Report. Contributions by and support from members of SVHE and the Association for Integrative Studies (AIS) are particularly acknowledged. The chair thanks the College of Arts and Sciences of the University of Alabama/Tuscaloosa for underwriting photocopying, mailing, and telephone costs, and New College for temporary membership in AAC.

Some of the agenda for this report was determined by the national advisory committee to the AAC Project on Liberal Education, Study in Depth, and the Arts and Sciences Major, as well as by the important AAC publication *Integrity in the College Curriculum*. In addition to meeting with the other task forces and national committee members, we engaged in the following activities:

- analysis of extensive program materials submitted by more than thirty programs in the United States and Canada
- survey of AIS publications, including their journals and directory of IDS programs, and of extensive background readings compiled by the staff of AAC
- consultation with officers of AIS and with other professional colleagues who provided feedback on versions of the Report. For detailed critiques and responses, we thank especially Irena Makarushka, Bowdoin; Barbara M. Lawrence, Hartwick; Bernard Sloan, Dean, and the faculty of New College, University of Alabama/Tuscaloosa.
- verbal responses to the first draft of our Report by members of the Philosophy Network of AIS, followed by written responses
- a presentation and discussion session at the annual Fellows Meeting of the SVHE, which included many instructors and administrators of IDS programs and courses
- reference to our own experiences in the field (ranging widely over a considerable number of years and types of situations)
- the project design and budget allowed face-to-face working together at several points during the three-year study; we learned from each other as well as from drafts of the other task force reports
- two presentations and discussion of the first phase of the Task Force findings at the San Francisco 1990 meeting of the American Association of Colleges, and a session with presentations on three examples of IDS practice (Hutchins School of Liberal Studies, Sonoma State; SUNY/College at Old Westbury; East Asian Studies, Wittenberg).

B. HISTORICAL OVERVIEW: IDS IN AMERICAN EDUCATION

Throughout the twentieth century interdisciplinarity has played an important role in the construction of new and alternative institutional structures, and as a change agent in developing new integrative methodologies, conceptual approaches, and theories. The origin of interdisciplinarity is variously dated, though its roots lie in the classical ideas of synthesis and unity of knowledge. As the modern disciplines were institutionalized in the nineteenth-century research university, these ideas were not lost but were transformed in a variety of new forms of research and teaching.

In the first half of the century the most prominent activities were in general education and the social sciences. After World Wars I and II broad, nonspecialized, and thematic-driven courses and programs were introduced into the curriculum. The "general education" movement was interdisciplinary in several respects: in the effort to combat the fragmentation created by burgeoning specialization, in attempts to reorganize and integrate knowledge along other than disciplinary lines, in the commitment to dealing with contemporary issues and problems by drawing on more than one discipline, and in concern for the human problems created by specialization. Interdisciplinarity in the social sciences was propelled by integrative projects organized under several auspices: those of the Social Science Research Council, the interactionist framework, the culture-personality and unity of science movements at the University of Chicago, the area studies approach, the rise of applied social science, and the evolution of hybrid fields such as social psychology.

At mid-century the interdisciplinary landscape expanded because of the dramatic escalation of large-scale interdisciplinary problem-focused projects, a movement that spans the Manhattan Project and the evolution of operations research. It likewise included interdisciplinary collaboration originating in the mission orientation of the U.S. Department of Agriculture, and in defense, aerospace and industrially-related research by the National Aeronautics and Space Administration and the National Science Foundation. While problem-focused research was attaining a visible presence on campuses in the form of research institutes, centers, and projects, a number of synthetic theories were having an impact on the structure of inquiry, among them Marxism, structuralism, and general systems theory. A rich variety of cross fertilizations transformed the nature of modern disciplines: for example, in the impact of plate tectonics on the earth sciences, the borrowing of

methods and concepts across the natural sciences, the drive toward grand simplifying concepts such as the second law and mass-energy equivalence, the impact of the man-land thesis on geography, and the rise of economic and social history.

Today, in the last decade of the twentieth century, interdisciplinarity is characterized by projects that bridge not only disciplines but also government, industry, and the university. This trend is readily apparent in the NSF-funded multidisciplinary engineering centers, as well as in the new science and technology centers. Alongside the escalating presence of this kind of instrumental interdisciplinary problem-solving on campus, the cross fertilization of all sectors of knowledge has led to the various "turns" in disciplines that have promoted communication across once isolated spheres of knowledge. Examples include the "interpretive" and "linguistic" turns in the social sciences; widening awareness of the social and rhetorical construction of knowledge; the expanding influence of "textualism"; the revival of the ancient art of rhetoric; and new alliances among the disciplines of literary studies, anthropology, and sociology. Likewise in the postmodern critique of knowledge the idea of interdisciplinarity is linked with contemporary cultural theory, and expanded. Once characterized by American studies, women's studies, environmental studies, and materials science, interdisciplinary fields now include peace studies, cognitive science, cultural studies, and various types of health-care.

Interdisciplinary education today reflects the enormous vitality and variety of the history we have sketched. Until the 1960s most U.S. college and university programs of general and interdisciplinary education tended to emulate the earlier Harvard, Columbia, and Chicago models in the general education tradition. That changed dramatically in the 1960s and 1970s with the evolution of programs of ethnic and minority studies as well as urban and environmental studies. The period was also marked by the design of interdisciplinary universities structured around multi-subject schools as well as cluster colleges and autonomous programs in traditional colleges and universities. As these programs appeared, new names entered the folklore of US higher education, such as the University of Wisconsin/Green Bay, the University of California/Santa Cruz, the Paracollege at St. Olaf, the Evergreen State College, and the Hutchins School of Liberal Studies at Sonoma State University. Even though a number of the experiments of the 60s and 70s were victims of subsequent declines and shifts in financial and intellectual support, many of the programs currently in existence emerged from that tradition. Moreover, despite the popular association of American interdisciplinary education with strictly general education, IDS today assumes a multiplicity of forms, as is evident in Appendix C.

Concomitantly there is no "typical" interdisciplinary student. In a growing number of US universities and colleges, students choose interdisciplinary options to satisfy general education requirements, which represent curricular reforms and revisions born of a renewed call for coherence and integration in the undergraduate curriculum. Most often this option is available in the first and/or second years of study, although Alaska Pacific University and St. Joseph's College (Indiana) distribute the interdisciplinary general education experience throughout the usual four years. Students may pursue interdisciplinary majors in the liberal arts tradition, combining exposure to essential knowledge in the humanities, social sciences, and science and technology, with electives in the disciplines and an integrative capstone experience.

And there are interdisciplinary majors in a wide variety of more specialized areas, including cybernetic systems, human services, urban studies, multicultural education, regional and ethnic studies, border studies, environmental studies, human ecology, human development, materials science, and the field of science, technology, and society. Furthermore it is possible to pursue graduate interdisciplinary education in such areas as liberal studies, American studies, the history of consciousness, and the humanities. Finally, the professional schools have turned to interdisciplinary courses to acquaint their students with the complexity of professional practice, and are many individual courses are designed to help students comprehend the cross-fertilizations of research in their disciplinary areas.

Students also pursue IDS for other reasons. Nursing students may be enrolled in a course centered on integrated approaches to the care of children with craniofacial anomalies, alerting them to the inter-

relationships among dental, psychosocial, and surgical treatments. Doctors training at a medical school basing its curriculum on the organ model or utilizing interdisciplinary residencies are learning about the inter-relationships among clinical, chemical, rehabilitative, psychosocial, and ethical approaches. A future lawyer or engineer may enroll in an integrative seminar on the social and ethical dimensions of professional practice. A working adult returning to school may decide to pursue an interdisciplinary general studies degree in a curriculum that is theme- and problem-driven, while another student may pursue a more specialized interdisciplinary degree in systems engineering.

Yet another undergraduate may choose an undergraduate major in social ecology or psychology, as background for work in a social service agency, a government office, or a school system. Still another may choose an integrated curriculum in a small church-related college as an alternative to a discipline-based, secular education. One group of students may take interdisciplinary courses to fulfil general education requirements, while another group may enroll in a required interdisciplinary core centered on major ideas and issues in Western history and culture.

C. THE VARIETY OF IDS PROGRAMS

Recent across-the-board integration and synthesis of freshman studies and pre-professional programs, as well as capstone integrative courses, demonstrate that any of these sorts of programs can be self-consciously designed with respect to interdisciplinary effectiveness. IDS programs may both provide minors or majors and serve as umbrellas for integrative courses among several departments or schools. Examples would include programs in Humanistic Studies, Origins of Western Culture, East European or Asian Studies, and Women's Studies. Some IDS programs or committees sponsor cluster-programs that serve majors from several departments in area studies and semester-abroad programs. In addition many schools provide for the exceptional student who desires not merely a double major, but a truly-interdisciplinary concentration. Examples include American Studies; East Asian Studies; Science, Technology, and Science; Environmental Studies; and Cognitive Science.

A science major may take a more "specialized" upper-level interdisciplinary course focused upon the most recent developments on the frontiers bordering chemistry and physics; a social science major may enroll in an honors program integrating mathematical training into the study of social sciences; or a humanities major may elect a course of training in arts management. Also, professors within a single department may bridge in their individual work several disciplinary perspectives and methodologies. Individuals holding appointments in more than one school may connect their methods and research usefully--we observed examples in business law and the psychological or communicative aspects of school administration. Individual students in some institutions may be able to design a major concentrating on overlapping areas. And finally there are expressly interdisciplinary programs that depend for their vitality upon co-ordinated contributions from faculty of several schools and/or departments. Both honors and women's studies programs often operate in such a manner, but the latter is more likely to have devoted careful attention to the overall integration of the resulting instruction or major.

On some campuses there may also be IDS within very large departments. To illustrate, a linguistics specialist may co-operate with a foreign language instructor and a comparative literature instructor to develop a course within one department that integrates all three types of knowledge. These same instructors may subsequently team with a history instructor and instructors from the arts and sociology and psychology, in order to develop a field-wide approach to a particular period or region.

It is also possible to pursue graduate interdisciplinary education in such areas as liberal studies, American studies, the history of consciousness, and the humanities. Finally, professional schools turn to interdisciplinary courses to acquaint their students with the complexity of professional practice, and many individual courses help students to comprehend the cross-fertilizing research current in their disciplinary areas. Examples we found include a physics course designed to familiarize students with work being done on

the frontiers between theoretical physics and biology as well as courses bridging business and law, history and political science.

Interdisciplinary majors that we examined in detail included the following: General Education and BA in Humanities; Arts & Humanities Division of school; entire school; Honors; International Politics and Economics (International Studies packaged variously); East Asian Studies; Russian and Soviet Studies; American Cultures; Psychobiology; Neuroscience; Biochemistry and Molecular Biology; Marine Biology; Environmental Studies; Environment, Technology, and Society; Mathematical Models; Cognitive Science; Public Policy Studies; Labor Studies; Legal Studies; Language and World Business; Social Ecology.

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