# Defining Interdisciplinary Research: Conclusions from a Critical Review of the Literature

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**Objective.** To summarize findings from a systematic exploration of existing literature and views regarding interdisciplinarity, to discuss themes and components of such work, and to propose a theoretically based definition of interdisciplinary research.

**Data Sources/Study Setting.** Two major data sources were used: interviews with researchers from various disciplines, and a systematic review of the education, business, and health care literature from January 1980 through January 2005.

**Study Design.** Systematic review of literature, one-on-one interviews, field test (survey).

**Data Collection/Extraction Methods.** We reviewed 14 definitions of interdisciplinarity, the characteristics of 42 interdisciplinary research publications from multiple fields of study, and 14 researcher interviews to arrive at a preliminary definition of interdisciplinary research. That definition was then field tested by 12 individuals with interdisciplinary research experience, and their responses incorporated into the definition of interdisciplinary research proposed in this paper.

**Principal Findings.** Three key definitional characteristics were identified: the qualitative mode of research (and its theoretical underpinnings), existence of a continuum of synthesis among disciplines, and the desired outcome of the interdisciplinary research.

**Conclusion.** Existing literature from several fields did not provide a definition for interdisciplinary research of sufficient specificity to facilitate activities such as identification of the competencies, structure, and resources needed for health care and health policy research. This analysis led to the proposed definition, which is designed to aid decision makers in funding agencies/program committees and researchers to identify and take full advantage the interdisciplinary approach, and to serve as a basis for competency-based formalized training to provide researchers with interdisciplinary skills.

**Key Words.** Interdisciplinary, transdisciplinary, collaboration, research, definition

As scientific knowledge in a wide range of disciplines has advanced, scholars have become increasingly aware of the need to link disciplinary fields to more fully answer critical questions, or to facilitate application of knowledge in a specific area. For example, the discovery that tobacco use was associated with high rates of lung disease was not sufficient to lead to smoking cessation; the addition of research on risk assessment, motivation, and reasoned action were all important in designing programs that have fostered the current lower rates of tobacco use. This recognition has stimulated a steadily growing interest within the scientific community in developing new knowledge through research that combines the skills and perspectives of multiple disciplines. This may be in part a parallel of the wider societal interest in holistic perspectives that do not reduce human experience to a single dimension of descriptors, and to awareness that a number of extremely important and productive fields of study are themselves interdisciplinary: biochemistry, biophysics, social psychology, geophysics, informatics, and others. Recent publications in *Health Services Research* exemplify the complexities involved in health services research and the need for an interdisciplinary approach (Glied et al. 2005; Gonzales et al. 2005; Hunt, Gaba, and Lavizzo-Mourey 2005; McLaughlin 2005).

A number of research centers funded over the past decade by the National Institutes of Health (NIH; e.g., Center for Evidence-Based Practice in the Underserved; Center on Population, Gender, and Social Inequality; Interdepartmental Neuroscience Center) are labeled as interdisciplinary and have involved scholars from multiple disciplines in productive research endeavors. NIH has identified interdisciplinarity as an essential contributor to needed knowledge and made it an explicit priority in its recent Roadmap.

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The Roadmap, a new strategic plan for future NIH funding (http://nihroadmap. nih.gov/interdisciplinary/index.asp), describes interdisciplinary research as that which:

> *integrates the analytical strengths* of *two or more* often disparate *scientific disciplines* to solve a given biological problem. For instance, behavioral scientists, molecular biologists, and mathematicians might combine their research tools, approaches, and technologies to more powerfully solve the puzzles of complex health problems such as pain and obesity. By engaging seemingly unrelated disciplines, *traditional gaps in terminology, approach, and methodology might be gradually eliminated.* With roadblocks to potential collaboration removed, a true meeting of minds can take place: one that broadens the scope of investigation into biomedical problems, yields fresh and possibly unexpected insights, and may even give birth to new hybrid disciplines that are more analytically sophisticated (emphasis added).

While descriptive statements and lists of disciplines may be of value in informing observers about interdisciplinary research, they lack the precision needed to determine whether a given research effort is truly interdisciplinary, or simply happens to have been conducted by individuals with different credentials or employed in different academic departments.

Although scholars in the health sciences have developed research teams that often include members of multiple disciplines, the nature of interdisciplinarity and the concept of interdisciplinary research varies across disciplines, as do expectations and values of participants regarding the process of interdisciplinary research. A more precise definition of interdisciplinary research is needed so that funding agencies and researchers themselves can identify the competencies and resources necessary for successful interdisciplinary contributions to science. Such knowledge would be of great use in guiding both research design and funding decisions.

One endeavor to support and enhance interdisciplinary research within the Roadmap is the funding of 21 exploratory centers for interdisciplinary research (http://nihroadmap.nih.gov/interdisciplinary/exploratorycenters/). The authors are associated with one of these interdisciplinary centers, the Center for Interdisciplinary Research on Antimicrobial Resistance (CIRAR, http://www.cumc.columbia.edu/dept/nursing/CIRAR/). Currently our research collaborative team includes persons from the disciplines of epidemiology, microbiology, pediatrics, infectious disease, nursing, economics, health policy, education, biostatistics, economics, informatics, public health, and

more. Before joining CIRAR, these individuals had been engaged in research programs that range from bench science at the cellular level, clinical trials in hospitals and communities, cost–benefit and cost-effectiveness analysis and community-based participatory research. All of the members of CIRAR have engaged in collaborative work in the past, using their own sense of good scholarship to guide the process. Like many researchers, their experience with the "practice" of interdisciplinarity is a valuable resource, but in order to realize the full potential of this approach to research there must be an effort made to pool these resources across multiple fields.

### Objective

The purpose of this paper is to summarize findings from a systematic exploration of existing literature and views regarding interdisciplinarity, to discuss themes and components of such work, and to propose a theoretically based definition of interdisciplinary research. Before the review of literature, the authors held interviews with individuals engaged in successful research involving multiple disciplines. A preliminary definition based on the interviews and subsequent literature review was composed. The definition was then field tested and modified to arrive at our proposed definition of interdisciplinary research. The aim of the project was to propose a definition that could then be used, among other applications, to identify the competencies needed for successful interdisciplinary research practice from which curriculum to teach interdisciplinarity could be developed.

## METHODS

This analysis of interdisciplinary research used two primary data sources: interviews with experienced researchers and a systematic literature review. The first data source was a series of one-on-one systematic interviews conducted by the CIRAR director with the 14 researchers (physicians, nurses, and researchers from public health and the social sciences) who were core members of the CIRAR interdisciplinary research center. These individuals had been selected for Center membership because they were experienced and successful researchers whose work bridged several disciplines. In these interviews, respondents were queried regarding their own work styles and the specific characteristics, which they sought in others in order to achieve successful interdisciplinary collaborations. The interviewer asked 10 questions on

the researcher's attitudes and behaviors regarding their own professional lives and their disciplinary and interdisciplinary collaborations. The responses were categorized and summarized descriptively.

The larger data source was a systematic literature review conducted in three bodies of academic literature: education, business, and health care. Each was searched by one or more collaborators with expertise in the respective field. Inclusive dates for searches were January 1980 through January 2005 (25 years); only English language books and peer-review journal articles were included, and search terms used were "interdisciplinarity," "interdisciplinary research," and "collaborative research." Databases searched included Pro-Quest ABI/INFORM Global (http://proquest.umi.com/pqdweb), which includes business, economics, and management literature; PubMed (http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?DB=pubmed) for biomedical literature; and the Educational Resources Information Center (ERIC) database: (Washington, DC: Office of Educational Research and Improvement, U.S. Department of Education) for educational literature. In addition to the peer-reviewed search engines, a review of unindexed reports and publications from health-related foundations with a known interest in interdisciplinary efforts was added. In the articles reviewed, factors identified as important to the success of interdisciplinary research were categorized as environmental/institutional factors, team factors, or individual characteristics of team members.

The initial search produced over 500 sources related in some way to interdisciplinarity. Articles or books were then evaluated for their content; only sources that addressed some aspect of the interdisciplinary research process and theory were included. Many of the sources excluded were examples of interdisciplinary research studies that did not include an analysis of the interdisciplinary process itself or any discussion of definitions.

Based on information synthesized from the literature review and the researcher interviews, a preliminary definition of interdisciplinary research was composed. As a final step, this preliminary definition was field tested by a set of researchers experienced in interdisciplinary work. Twelve individuals (four senior researchers with extensive interdisciplinary experience from academic institutions in three other states and eight members of CIRAR) were asked to review both the NIH definition of interdisciplinary research and the preliminary definition proposed by selected members of the CIRAR Interdisciplinary Working Group based upon a review of the literature. No one involved in the creation of the draft definition participated in the field test. Each individual completed a written survey that included both the NIH

definition and draft definition. They were asked to identify critical elements of the draft definition, delete elements that did not belong in the definition, suggest additions from the NIH definition, and make other suggestions related to additions or refinements.

## RESULTS

### Researcher Interviews

Themes that emerged regarding successful interdisciplinary work included respect for the scientific process and importance of collaborative research; identifying interesting topics; management, focus, and editing of work; and the ability to make mistakes gracefully. The researchers interviewed were seasoned professionals with a history of successful interdisciplinary research; their attitudes and behaviors toward scholarly work and collaboration was greatly informative as successful "case studies." They identified 27 personal characteristics that they valued in collaborators and 13 ways in which interdisciplinary research could contribute to their work. Although the data from these interviews helped in getting a sense for how senior interdisciplinary researchers think, no definitional specifics emerged from these interviews.

### Literature Search

While >500 articles or books related to the general theme of interdisciplinarity were initially identified, only 42 articles or books were specific to the topic of interdisciplinary research (as opposed to examples of interdisciplinary research). The majority of these papers (30/42, 71.4 percent) were from the health and social sciences literature and had a mean of 2.8 (Table 1) (Allen 1992; Barnes, Pashby, and Gibbons 2002; Beersma et al. 2003; Aram 2004; Cummings 2004; Hobman, Bordia, and Gallois 2004; Guimera et al. 2005) authors/article, 59.5 percent of whom were from the social sciences. Of these papers, one-third (14, 33.3 percent) were empirically based research about interdisciplinarity (Allen 1992; White 1999; Kone et al. 2000; Sullivan et al. 2001; Barnes, Pashby, and Gibbons 2002; Lattuca 2002; Beersma et al. 2003; Morillo, Bordons, and Gomez 2003; Schulz, Israel, and Lantz 2003; Aram 2004; Cummings 2004; Hobman, Bordia, and Gallois 2004; Senior and Swailes 2004; Guimera et al. 2005); the others were general discussions (Woollcott 1979; Jacobs and Borland 1986; Bloedon and Stokes 1994; Nissani 1997; Israel et al. 1998; Lindauer 1998; Northridge et al. 2000; Stead and Harrington 2000; Anderson 2001; Aagaard-Hansen and Ouma 2002;

Table 1:   Reviewed Articles from the Health Care, Business, and Education Literatures ($n = 42$)

| Characteristic | Number |
|---|---|
| General field | |
| Health care/health sciences | 16 (38.1%) |
| Social sciences | 14 (33.3%) |
| Business | 7 (16.7%) |
| Education | 5 (11.9%) |
| Number of authors/article | 1–7 (mean: 2.8) |
| Discipline(s) of authors | |
| Social science | 25 (59.5%) |
| Public health | 11 (26.2%) |
| Policy/management | 10 (23.8%) |
| Business | 9 (21.4%) |
| Education | 9 (21.4%) |
| Nursing | 7 (16.7%) |
| Medicine | 6 (14.3%) |
| Other (engineering, economics, basic science) | 5 (11.9%) |
| Type of paper | |
| General discussion | 16 (38.1%) |
| Research | 14 (33.3%) |
| Case study | 11 (26.2%) |
| Literature review | 1 (2.4%) |
| Factors identified as important | |
| Environmental/institutional factors | 23 (54.8%) |
| Interdisciplinarity explicit in mission | 18 (42.9%) |
| Resources for interdisciplinary work provided | 16 (38.1%) |
| Rewards and promotion related to interdisciplinary work | 12 (28.6%) |
| Team factors | 26 (61.9%) |
| Communication/trust/interpersonal relationships | 23 (54.8%) |
| Composition of team/balance of power | 21 (50.0%) |
| Shared values and goals | 15 (35.7%) |
| Leadership | 11 (26.2%) |
| Differences in methods/approaches | 7 (16.7%) |
| Other (time constraints, team size, philosophic convergence) | 8 (19.0%) |
| Individual characteristics of team members | 8 (19.0%) |
| (e.g., commitment, agreeable, flexible) | |
| Includes | |
| Explicit definition of interdisciplinarity | 11 (26.2%) |
| Conceptual framework | 5 (11.9%) |

Board of Health Care Services 2003; Frost and Jean 2003; Nyden 2003; Jacobson, Butterill, and Goering 2004; Slatin et al. 2004), cases studies (Dodgson 1992; Rosenfield 1992; Bisby 2001; Higgins, Maciak, and Metzler 2001; Lantz et al. 2001; Lattuca 2001; Cheadle et al. 2002; Austin 2003; Baba

et al. 2004; Daniels 2004; Tennenhouse 2004) and one literature review (Berkowitz 2000). Eleven (26.1 percent) of the papers included an explicit definition of interdisciplinarity and only five papers (11.9 percent) described or cited any type of conceptual framework or theoretical underpinnings for their approach to interdisciplinary research (three distinct typologies, see Table 2).

Authors described multiple factors essential to the success of interdisciplinary work. In these papers, 54.8 percent discussed environmental/institutional factors such as an explicit institutional commitment to interdisciplinarity and sufficient resources; 61.9 percent mentioned team factors such as communication, leadership, and trust; and 19.0 percent described individual characteristics of team members such as commitment, flexibility, and being agreeable to work with.

*Divergent Paradigms of Interdisciplinary Research.* Divergent paradigms of inquiry were reflected in the physical and social sciences as contrasted with the humanities, with associated differences in methodologies and premises. The physical and social sciences employed a *positivist* or *postpositivist* mode of inquiry in which an appreciable reality exists and is objectively (although sometimes imperfectly) knowable. The methodologies of the physical and social sciences are primarily hypothesis driven and use experimentation and manipulation to achieve objectivism. The typology proposed by Rosenfield (1992) (Table 2), consistent with the hypothesis-driven approach employed by these fields in which the starting point for all collaborations is a common problem or question, was most cited by references from the social, health, and physical sciences. The humanities employed a *critical theory* or *constructivist* mode of inquiry in which reality is experientially based, historically shaped, and its understanding is only relative in nature. The methodologies are not hypothesis driven and the approach emphasizes subjectivism and the inherent interaction between the investigator and the subject, as defined by Guba and Lincoln (1994). The finding that qualitative modes were a key feature suggests that the quantitative approach is more of a technique than a way of knowing. Explicated assumptions and values are part of qualitative inquiry, and perhaps better set the stage for dialogue.

*Key Definitional Components.* Of the 42 references identified, 14 contained some language describing key definitional components of interdisciplinary research. The components offered were a synthesis of both the author's personal experience and his or her knowledge of the interdisciplinary

Table 2: Typologies of Interdisciplinary Research

| | | Typology | |
|---|---|---|---|
| *Author* | *Lattuca (2001)* | *Klein (1996)* | *Rosenfield (1992)* |
| **Degree of synthesis** | | | |
| Least | Informed disciplinarity: disciplinary questions may be informed by concepts or theories from another discipline<br>Synthetic disciplinarity: questions that link disciplines (question either belongs to both or neither disciplines) | Instrumental interdisciplinarity: bridge building between fields. Problem-solving activity, does not seek synthesis or fusion of different perspectives | Multidisciplinary: teams work in parallel or sequentially from their specific disciplinary base to address a common problem |
| Moderate | Synthetic disciplinarity | Epistemological interdisciplinarity: restructuring a former approach to defining a field | Interdisciplinary: teams work jointly but still from a discipline-specific base to address a common problem |
| Greatest | Transdisciplinary: the application of theories, concepts, or methods across disciplines with the intent of developing an overarching synthesis<br>Conceptual interdisciplinarity: questions without a compelling disciplinary basis | Transdisciplinary: a movement toward a coherence, unity, and simplicity of knowledge | Transdisciplinary: teams work using a shared conceptual framework, drawing together discipline-specific theories, concepts, and approaches to address a common problem |

literature. A single exception (Morillo, Bordons, and Gomez 2003) was an attempt to empirically define interdisciplinarity based on bibliometric methods in which the degree of interdisciplinarity of a given field of study was determined by the number of subject categories assigned to disciplinary journals by the various citation indices.

The key definitional components from the literature review were:

(1) *Qualitatively different modes of interdisciplinary research.* There were three predominant typologies of interdisciplinary research cited in the literature. Distinctions were often made based upon where along the continuum of synthesis the various disciplines fell. Different points along the continuum represent qualitatively different forms of collaboration. These typologies are categorized in Table 2.

(2) *Existence of a continuum of collaboration.* In all sources there was common acknowledgement of a continuum with respect to interdisciplinary research and the degree of synthesis involved in the process and achieved in the outcome. One example describing the process: "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."(OECD [1998] quoted in Morillo, Bordons, and Gomez [2003, p. 1237]).

(2a) *Definition and fidelity to disciplinarity.* Several references defined the disciplinarity of interacting members by content (e.g., "thought domains" [Aram 2004], "specific body of teachable knowledge" [Woollcott 1979], "conceptual specificity" [Robertson, Martin, and Singer 2003], or "journal sets" [Morillo, Bordons, and Gomez 2003]) or by social factors (e.g.,"isolated domains of human experience possessing its own community of experts" [Nissani 1997], or "self-regulating and self-sustaining communities" [Lattuca 2002]).

(2b) *Degree of cooperation or interaction.* A critical component of a vast majority of the definitions was the degree of cooperation or interaction between members of the collaborative teams, the amount of contact between team members and the degree of sharing of information. Modes of interdisciplinary research with low degrees of synthesis (see Table 2) necessitate very little, if any, cooperation between researchers. Modes of interdisciplinary research with even a moderate degree of synthesis between disciplines require ever-greater degrees of interaction between researchers.

Distinctions were often made with respect to what is shared, that is, whether it is limited to the specific research topic of concern or extended to include discussions regarding methods and conceptual frameworks.

(2c) *Degree of communication and sharing.* A similar but distinct issue was the degree of communication between interdisciplinary members. Team members may remain loyal to their respective disciplinary languages, learn each others' terminology, or develop and use a common language. In modes with a moderate degree of synthesis, team members will often share a research problem and interact with one another but still employ their respective disciplinary methods, conceptual frameworks, and languages. Transdisciplinarity requires the greatest synthesis of approach. In this mode, teams not only share a common question but also often share and borrow methods, create a common conceptual framework, and either learn each other's disciplinary language or create a new common language. As the literature review proceeded, the existence of a continuum from multidisciplinary to interdisciplinary to transdisciplinary was apparent. Attempting to define interdisciplinary research without attention to the precursor and subsequent approaches made no sense. Table 3 summarizes the defining characteristics of each of these stages with examples from health systems and policy research.

(3) Outcome of the collaboration (e.g., solution to discrete problem, new language). Finally, the outcome of the collaboration was often included as a component of the definition. Authors noted that interdisciplinary research may result in the solution of a discreet problem, a single or group of publications, the development of a new field and/or language, and by some in the humanities, the process of the interdisciplinary endeavor itself was the intended outcome. Transdisciplinary endeavors set out to create synthesis between disciplines and are the mode most likely to result in the development of a new field of study or language.

## Field Test

A preliminary definition of interdisciplinary research was developed, based on the key themes and continuum identified in the literature search: "Any study or group of studies undertaken by scholars from two or more distinct

Table 3:    Characteristics of Multidisciplinary, Interdisciplinary, and Transdisciplinary Research

| | Participants/ Discipline | Problem Definition | Research Style | Presentation of Findings | Examples from Infectious Disease Literature |
|---|---|---|---|---|---|
| Multidisciplinary | Two or more disciplines | Same question but different paradigm OR different but related questions | "Parallel play" | Separate publications by participants from each discipline | Medicaid cost containment and access to prescription drugs, Cunningham (2005) Lichtenberg (2005): The effect of access restrictions on the vintage of drugs used by Medicaid enrollees |
| Interdisciplinary | Two or more distinct academic fields | Described/defined in language of at least two fields, using multiple models or intersecting models | Drawn from more than one, with multiple data sources and varying analysis of same data | Shared publications, with language intelligible to all involved fields | The "Minimizing Antibiotic Resistance in Colorado" Project: Impact of patient education in improving antibiotic use in private office practices, Gonzales et al. (2005) |
| Transdisciplinary | Two or more distinct academic fields | Stated in new language or theory that is broader than any one discipline | Fully synthesized methods, may result in new field | Shared publications, probably using at least some new language developed for translation across traditional lines | Assessing the implementation of the Chronic Care Model in quality improvement collaboratives, Pearson et al. (2005) |

academic fields, based on a conceptual model that links or integrates theoretical frameworks from those disciplines, using study design and methodology that is not limited to any one field, and requiring the use of perspectives and skills of the involved disciplines in all phases from study design through data collection, data analysis, specifying conclusions and preparing manuscripts and other reports of work completed." This preliminary definition was then subjected to a field test of review by twelve experts in interdisciplinary research. All but one reviewer had self-identified expertise in more than one discipline including biochemistry, economics, epidemiology, genetics, health care-associated infections, health policy, infectious disease, internal medicine, medicine, microbiology, molecular biology, nursing, nursing informatics, patient safety, pharmacology, pharmacy, public health, quantitative research, radiology, sociomedical sciences, women's health, and infectious diseases.

Issues raised and discussed by the group included the scope of the definition (i.e., whether it should be limited to health-related research) and the extent to which it should be limited to academic disciplines. One addition to the draft definition was suggested with six reviewers indicating that some variation of the NIH statement "to solve a given biologic problem" should be incorporated, but only two of these reviewers left biologic in the statement. The primary focus of suggestions for replacement text was the phrase "academic fields." In some instances, academic was simply deleted. Other replacements included: scientific disciplines, disciplines, and investigative fields.

Based on the field test, we chose not to include the statement "to solve a biologic problem" in order to retain a broader definition not limited to health sciences and to describe those involved in interdisciplinary research as "scholars" rather than members of an academic discipline.

## DISCUSSION

Based on our systematic literature review, interviews and field test with interdisciplinary researchers, the authors recommend the following definition of interdisciplinary research:

> Interdisciplinary research is any study or group of studies undertaken by scholars from two or more distinct scientific disciplines. The research is based upon a conceptual model that links or integrates theoretical frameworks from those disciplines, uses study design and methodology that is not limited to any one field, and requires the use of perspectives and skills of the involved disciplines throughout multiple phases of the research process.

This definition may prove useful to decision makers in funding agencies or on program committees. The mere addition of researchers from various disciplines or with different academic and professional credentials is not sufficient to make a research effort interdisciplinary. Analysis of the conceptual framework, study design and execution, data analysis, and conclusions can be used to establish the true degree of interdisciplinarity. As noted in the results, serious consideration was given to limiting this definition of interdisciplinary research to biologic problems. While this limitation may apply to much research on the specific topic of CIRAR, or of many NIH-funded studies, the definition was not intended to apply only to those cases. There are many interdisciplinary studies in the heath field that are primarily directed toward a systemic, economic, or social issue with a much more remote link to a biologic problem. Any group of scholars, or any funding agency, will place some limitation on the type of problem to be solved, and could easily do so by modifying "problem" in the generic definition provided.

Further, the use of this definition will provide the basis for the specification of the competencies necessary for an individual researcher to move from accomplishment in his/her original discipline to successful participation in interdisciplinary work. Focus on needed competencies can then drive team development within established interdisciplinary centers and training programs for the next generation of interdisciplinary scholars. Our proposed definition may also shed more light on other practical issues needed to facilitate interdisciplinary research endeavors, as an example, those addressed by the National Academy of Sciences (NAS 2005) such as institutional handling of promotion/tenure, and training for students, fellows, and faculty. Clarification of interdisciplinarity in health-related research will provide the foundation for a more complete understanding of transdisciplinary efforts, if experience proves that this third stage is an essential element of our efforts.

The focus on more holistic views of knowledge and the world have emerged in part as a counter to what is seen as the reductionistic efforts of single scientific disciplines. NIH and others have not abandoned the precision and detail that can emerge from single-discipline studies but the addition of truly interdisciplinary efforts can facilitate moving beyond individually established facts to meeting the complex challenges we face with more dynamic applications of emerging knowledge.

In summary, many researchers have conducted interdisciplinary research because they have recognized the limitations of their disciplinary perspective when faced with complex health care and health policy research questions. At this time, however, such interdisciplinary research often occurs

by default or in an unsystematic manner, depending upon the initiative of individual researchers. We believe that interdisciplinary research must increasingly become the standard rather than the exception because the approaches needed and the implications of health care and health policy research are by their very nature interdisciplinary. The development of an expanded definition of interdisciplinary research is a first step in the evolution of interdisciplinarity within health-related research from a random, unsystematic occurrence to an essential, teachable research approach.

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