

The Multidisciplinary Ph.D. Program at the University of Wisconsin-Milwaukee

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ABSTRACT

The University of Wisconsin-Milwaukee has developed a multidisciplinary doctorate which encompasses all departments. Although initial admission is to a disciplinary Ph.D., the degree is actually granted by the Graduate School itself. This paper discusses the background and operation of the program, as well as problems involved in such a venture.

BRIEF DESCRIPTION

The Multidisciplinary Ph.D. program at the University of Wisconsin-Milwaukee was approved by the Graduate Faculty Council in December of 1984. The first student was admitted to the program in the Spring of 1988. At present, there are now three students formally in the program, one of whom is in a program including Library and Information Science.

Unlike many other multidisciplinary programs, which involve formal agreements among a few departments or colleges, UWM's Multidisciplinary Ph.D. is University-wide. In other words, as long as a disciplinary department which awards a Ph.D. participates, the program may involve any collection of departments, with any combination of subjects. Thus, it is possible for a given student to develop a program combining areas such as geography, education, library and information science, and management, while another might combine library and information science, and philosophy; and another, nursing, psychology, and urban studies.

In short, the Multidisciplinary (M-D) doctorate at UWM is a completely open-ended program: a given student, under the direction of the program's committee, may "create" a Ph.D. specifically to his or her interests. To insure the appropriate

quality in such a program, the Graduate School has been very careful to develop a number of monitoring mechanisms.

While we will discuss the program in some detail below, a brief outline will be useful at this point: The M-D Ph.D. is directed by a committee of graduate faculty chosen by the candidate after admission to the university. The prospective candidate must first be admitted to an existing disciplinary doctoral program, under the criteria used by that program for its own students. After admission, with the advice of the student's mentor, the student prepares a program and the appropriate committee for a multidisciplinary degree. This program proposal must be approved both by the Graduate Faculty Council (through its program committee) and by the Dean of the Graduate School. Part of this proposal is the designation of a degree name. The student will receive the doctorate from the Graduate School, under the approved title, rather than from a disciplinary department.

JUSTIFICATION FOR THE PROGRAM

UWM is an urban institution, and is one of two state-sponsored doctoral universities in Wisconsin. Like many urban universities, it has the dual pressure of maintaining the traditional roles of the academy and also of serving the community of which it is a part. In particular, "The Wisconsin Idea" that the state university should work closely with government and businesses, is seriously maintained as a practical ideal. Thus, by the early part of this decade, it became clear that there were needs in many areas of society not met by the research training in the traditional disciplines.

The tendency has been recognized in a number of places, including anthropologist Clifford Geertz's 1980 essay, in which he noted an apparent "reconfiguration of thought" in the social sciences in which the lines between the disciplines became blurred, while the methods used to draw the lines are also changing. [1] Certainly, the development of such think tanks as the Institute of Advanced Studies at Princeton, or the collaborative efforts at the Research Triangle in North Carolina suggest a change in the way researchers approach problems. A recent survey of such institutions, and the cross-

disciplinary work in such areas as mathematics, linguistics, or "textualism" in literature merely establishes their ubiquity, not their novelty. [2] In fact, one could argue that Western thought (at least) began with a unified approach to knowledge, and then gradually divided "philosophy" into narrower and narrower components. On the other hand, GUSDORF argues that Western science has never abandoned this approach, predicting that we now see the convergence of it with other intellectual traditions.[3]

In practical terms, there is no question that the field of higher education has been experimenting with the multidisciplinary approach for some time. The development of "area studies" in the Fifties in the United States, for example, was one attempt at the college level to treat human knowledge in a way which changed the relationships among traditional academic disciplines. Perhaps the most pervasive application of the multidisciplinary approach, however, has been in the newer two-year colleges, which, whatever their faults, are not bound by long traditions.[4]

One approach to this apparent need to consider the needs of research work (and, obviously, training of researcher/teachers, a traditional goal of doctoral programs), could be the development of new doctoral programs similar to the "area studies" programs. The University of Wisconsin did not feel this approach was suitable due, in part, to the potential number of very small specialized "departments" or "programs" which could result. After all, in theory there are nearly an infinite number of combinations of existing departmental degrees which might be combined for particular purposes. Setting up one or two would at once reduce the flexibility of both faculty and students: which departments would be combined, and in what order?

A second difficulty in meeting the need is purely practical: the state regents, as a matter of policy, frown upon any new programs, especially if they appear to duplicate existing ones in any part of the state system. Thus, it is very difficult for any campus to start up a new degree program if any campus already has a program with a similar focus.

Under these circumstances, the UWM faculty decided to develop a program which would permit any properly justified program and at the same time, would build on the existing departmental structure.

We should note here that the School of Library and Information Science already has a number of joint Master's degree programs with other subject departments. In these programs, the student is able to obtain two Master's degrees for a total credit load less than would be required if the two degrees were sought separately. In effect, both SLIS and the subject departments accept some coursework in common for each degree. These arrangements, with History, Music, Geography, and Urban Affairs, have been successful at the master's level, and have thus demonstrated the possibility of cooperation for de-

partments in different schools and colleges of the university in developing innovative programs without major organizational changes.

HOW THE MULTIDISCIPLINARY PROGRAM WORKS IN GENERAL

Before discussing the operation of the M-D program within the Library and Information Science field, it is useful to describe the general operation of the program.

The first step is the admission of a prospective student to an existing disciplinary Ph.D. In each case, the usual admission requirements of any given department or school must be met. For example, some departments, such as Political Science, require a Master's in their own field; others require the Graduate Record Examination (as opposed to the Miller Analogies Test); and so on. To date, multidisciplinary students have indicated, at the time of first application, that they really intend to pursue the new M-D program; however, under the rules, this is not really required.

All prospective doctoral students, under university-wide rules, must file a formal program plan with the Graduate School, within the first year of residency. This is the stage at which the Multidisciplinary program becomes obvious to the campus at large. First, the student, with the assistance of relevant mentors, must create a committee to direct the degree program. While this committee may eventually be the dissertation committee, it is not required. In effect this ad hoc committee functions as the usual departmental doctoral program oversight committee.

The creation of this committee may well be the most crucial single step in the program. Of course all Committee members must be in the Graduate Faculty and certified by the GFC as capable of serving on doctoral-level dissertation committees. However, in addition to the usual need for personal compatibility, and relevant subject expertise, the members must be generally open to the concept of inter- and multi-disciplinary research. Generally, we assume that each department potentially relevant to the degree will have one representative. Since the committee must consist of five members, there is a certain amount of flexibility in its composition.

Here is the place where the role of the student's mentor becomes critical: what is a reasonable committee in terms of subject areas; who are reasonable committee members in terms of willingness to work in this topic, and availability to assist the student?

To date, the operating pattern has been for the student to contact several faculty before even applying to the program, and thus have defined the most logical department of first admission, plus obtained some idea of plausible committee members. Generally, two or three faculty are identified early

on, and work with the student to develop the rest of the program plan. In the process, this cadre also identifies and recruits the rest of the committee.

Assuming the committee cadre, the second step is development of the program plan. The lack of formal coursework requirements places a much greater burden on the student than a more traditional Ph.D. Generally, prospective students come to the program with at least a general idea of what they want to do, and why they want to do it.

The program plan becomes a rather detailed document. First, the student must justify why the M-D Ph.D. is appropriate: what is the topic of research interest? Why is this topic not appropriate to an existing disciplinary program (e.g. why can't the usual "minor" arrangements deal with the other disciplines)? In the process, of course, the student must also indicate that the appropriate departments/schools have been contacted, and agree with the plan.

Second, the student must establish he/she has the appropriate background to do the necessary work. To date, all applicants have come with significant practical experience, and a disciplinary master's degree. For example, one student has worked for over a decade in the field of sewage and water testing, and already has a chemical engineering degree; another has a masters beyond the MLIS, and over a dozen years' experience in libraries. An unwritten component of this part of the plan is some sort of evidence that the student can work independently, and is a "self-starter." Since nothing about the plan is automatic, (e.g. a "usual" sequence of first and second year seminars), this is very important. But, obviously, this does not appear, as such, in the written plan.

The next part of the plan is a general statement of the subject of the dissertation. Again, the student is not held to this, nor is a specific topic required. But, since the coursework and seminars are intended to fill in gaps in the student's preparation and to build on strengths, so that the research topic can be adequately dealt with, the topic is important. To date, the topic has been as specific as the effect of specific pollutants on a specific species of fish, and as general as "managing effects of technological change in larger libraries."

With the research topic defined, the fourth part of the plan is a list of courses to be taken. At UWM, a doctoral student may take any graduate level course (assuming prerequisites are met) in any department, regardless of the student's departmental affiliation. In addition, it is possible to take courses at other institutions, under the usual transfer rules of UWM's Graduate School. As a result, once the difficult part of defining the research area has been completed, the student has a very wide field of courses from which to pick.

It is clearly necessary for the student to establish some logical connection among all the courses, and to keep some reasonable prospective on the number of hours. UWM requires,

formally, 54 hours beyond the Bachelor's degree, or 27 beyond a Master's. In fact, the typical student completes about 50 to 60 hours beyond a Master's before beginning the dissertation.

We should note here there is no requirement for a timetable for these courses, other than the University rule that all Ph.D. requirements be met within 10 years of admission. Thus, some students have merely listed coursework; others have indicated exactly which courses will be taken by semester.

The next portion of the program plan is rather interesting: it is a proposed TITLE for the degree. As we noted, this degree is awarded by the Graduate School, rather than any department. Thus, in addition to the usual text on the diploma, and the indication that this is a "Doctor of Philosophy", the diploma must also have a name for the degree.

The time required for this plan has varied considerably. Usually, the student and the first mentor spend some time on two or three iterations; then the committee cadre revises this once or twice. Usually, in this process, the sorts of faculty required to complete the committee become obvious, and appropriate people are contacted. As one would expect, these new members tend to make at least a few modifications to the plan, based on their own expertise, experience with the university, and their understanding of interdisciplinary research.

Once the program plan has been completed, it must be approved by the Program Committee of the Graduate Faculty Council, and the Dean of the Graduate School.

The Program Committee of the GFC has general oversight of existing graduate programs (such as policies for five-year reviews), and reviews policies for new programs. It is composed of officers of the GFC, committee chairs of that body's Regulations and Requirements committees, a general delegate from the GFC, and the Graduate Dean and Associate Dean (*ex officio*)

Given the strong tradition of faculty governance at the University of Wisconsin, and the fact that the Dean of the Graduate School sits on the PC, approval of the Graduate Dean is normally assumed, IF the PC is unanimous. Thus, the student, his/her mentors, and the Program Committee take the approval process very seriously. The procedure is simple: each member of the committee receives a full copy of the student's Program Plan, After one to two weeks to review this written plan, the committee meets with the student and his/her major advisor.

Interestingly, in view of the nontraditional nature of the program, these committee meetings have been rigorous, but fair. The committee does not try to convince the student not to try the program, but rather works to insure that the program is sensible and doable. At times, members of the

committee have suggested alternate or additional courses. Always, members of the committee have had cogent questions, along the lines of "what is the point of this program?" A not-so-hidden agenda of this committee is to insure that the program is not in fact an attempt to present a "cheap" doctorate. After three of these formal meetings, by the way, one member who had been opposed to the very idea of the M-D degree on these grounds noted that, in actual operation, the reverse was true: the programs appeared, if anything, to be more rigorous than many disciplinary doctorates.

Assuming approval, the student now formally enters a multidisciplinary program. However, aside from the nature of the coursework and the committee overseeing the program, it does not appear administratively any different from any disciplinary program. The student's records remain administratively in the department of first admission; the primary advisor remains as well. Course grade reports and the like are also handled in the disciplinary department.

The major difference between an M-D program and the usual Ph.D. is in its committee-directed nature. In addition to meeting with the primary advisor on a regular basis, the student typically meets with the committee at least once a year, and with several members perhaps as often as two to three times a semester. However, the student retains a "primary advisor", who is usually the major advisor in the department of first admission.

During the M-D program, the student must meet the residence requirements of the first admission. That is, the M-D program does not, of itself, have any residency requirements. The usual UWM requirements are two semesters at 9 credit hours or three semesters at 6 hours. Regarding coursework, as noted above, the student, (like all UWM doctoral students) may take any course at an appropriate level in any department, as long as prerequisites are met. As may be imagined, scheduling these courses to meet the needs of the student's logical progression, plus his/her availability (time of day, and the like) can become complicated.

The progression of examinations for candidacy is set by the graduate school, again as modified by the admitting department. There are written and oral qualifying examinations, after which the student is formally admitted to candidacy for the degree. The thesis topic has been firmed up well before these examinations, so that work on that may be well underway by the time examinations are passed. The examining board comes from all the departments involved in the degree, but otherwise appears like any Ph.D. examination board.

One difference here may be the content of the examination. Clearly, the intent to maintain standards suggests that the exam will be rigorous. However, some concern has been expressed that the examiners will tend to act as a collection of individual subject experts, rather than as a combined mul-

tidisciplinary board.

The thesis is again directed by a committee. This is probably the same as that in the earlier phases of the program, but need not be. Again, other than the assumption that the committee remains multidisciplinary, there is no set requirement for its makeup. Assuming approval of the dissertation by the advisor and the committee, the student then formally defends the dissertation before this committee.

One interesting aspect of this program remains to be discussed--since the student was originally admitted to a disciplinary doctoral program, she/he retains the option of changing back to that program; presumably at any time. Assuming completion of appropriate requirements in the admitting department's doctoral studies, then, the M-D student always has the option of changing his/her mind, possibly retaining part of the multidisciplinary work as a minor. While this is unlikely, given the amount of effort involved in creating a M-D program to begin with, it is a possibility.

HOW THE PROGRAM WORKS IN LIBRARY AND INFORMATION SCIENCE

Since the M-D Ph.D. program began in the Fall of 1985, we have less than three years experience. In fact, the first students were admitted to the program only in the 1987-88 academic year, so much of this discussion is based only on the last year.

First, it is clear that there is great interest in such a program combining library/information science with other disciplines: nearly forty prospective students have written for information since the program began. At present, one student has been admitted and the program approved by the Graduate School; three others have applied for admission; and a number of others are in the process of applying.

We have set up some simple procedures to deal with this rather large number of inquiries. Most initial contact is by letter, so we have prepared an information packet and form letter to reply to these. The packet includes the graduate school's brochure on the multidisciplinary program, general application forms, catalog copy for all doctoral programs on campus (or, as available, special brochures), and the course catalog for the School of Library and Information Science. The letter attempts to describe the program in brief, and ends with a strong recommendation that the student contact the SLIS Program Coordinator before proceeding further.

Wherever possible, we encourage a personal meeting between the student and the coordinator. If not possible, we try to have a similar conversation by phone. We feel this initial information meeting is very important, due to the extreme flexibility of the program.

A number of misapprehensions seem to be common, and are

worth mentioning. First, a number of applicants, even after (presumably) having read all the material, seem to think the multidisciplinary part of the program is the combination of library science with information science.

Second, a number do appear to be shopping for a "cheaper" doctorate. In particular, the university requirement of only 27 hours beyond a master's seems to attract some interesting people. Some have noted that, since they hold the MLS/MLIS, they expect to complete the program in two calendar years. Others argue that, having two master's degrees, they already have met the coursework requirements and are "ready" for the dissertation work. Since both our letter and the brochure from the graduate school clearly indicate Ph.D.s are not granted merely for completion of coursework, the number of people who seem unaware of this is surprising. In any event, these are rapidly screened out.

Another category of question has to do with the residence requirements: since most students at UWM have at least part-time jobs, many find the potential of even two courses in a semester potentially difficult. The University, on the other hand, perceives the 6-9 hour-per-semester requirement as very liberal.

Perhaps the most complicated part of this initial interview, however, is the discussion of the nature of the "multidisciplinarity" of the program. Some potential students come with a fairly good idea of why they want a doctorate, and what sort of information they are after. Others are rather vague on both points. One might become cynical about the aspirations of some occupational groups after talking with some of these people: their main reason for a doctorate is increased salary (e.g. teachers and academic staff in unionized systems where promotion depends heavily on degrees earned). Again, with a personal interview, it is possible to determine where the applicant is merely unsure of what to do, and where the applicant really wants to "fill in the blanks" of an existing program. We emphasize this particular point because of continuing discussion of the role of research, in academe at large, and in the Library/Information Science profession in particular. One hardly expects everyone working toward doctorate to be passionately driven to do research, and such things as increased pay and prestige are certainly legitimate motivators. But after talking to the four or five people (out of about twenty interviewees) who see research purely as a hurdle to jump over, you begin to wonder what, exactly, is the general image of the Ph.D. Again, needless to say, these people are readily screened out, or at least are forced to reconsider their reasons for getting into a doctoral program.

Along similar lines, it is worth noting the amount of "math anxiety" (or perhaps "research anxiety") which appears to be present. In the process of discussing coursework, the subject

of statistical analysis always comes up--regardless of the research method one uses for the dissertation, a field like Library and Information Science certainly presumes at least a nodding acquaintance with statistics. Having eliminated the unserious students, this appears to be the biggest stumbling block we encounter: no one is happy with the idea of having to have an "intermediate" knowledge of statistical techniques; some are really frightened. To date, by the way, none of the applicants with library science backgrounds have taken any courses in research methods as part of the MLS at all, and several have even avoided any college-level mathematics.

Generally, this first interview takes about an hour and a half. Having explained the program, we try to work with the applicant to determine WHY they want an M-D doctorate, and WHAT they want to learn and WHAT they intend to do with such knowledge. Generally, this interview ends with a request that the student write out a statement answering these questions, and suggesting a second meeting (or phone call).

At the same time, we suggest potential departments of first admission, and recommend that the student contact them. Assuming the student still expresses interest in the process, we then attempt to contact appropriate faculty in other departments: the doctoral program coordinator is a natural; in addition, we attempt to help the student find faculty with the appropriate subject backgrounds who are willing to become involved in a non-traditional program.

The sorts of applicants we have are quite interesting. To date, we have one upper level library administrator, interested in the organizational effects of change resulting from automation; another interested in the development of international information sharing organizations and the role libraries play in these. We also have a pending application from a laser engineer who has discovered the applications of CD-ROM and similar technology in information transfer, and in the process has discovered information science; and another from a non-US student who is in a (US) "Library and Information Science" doctoral program which apparently has very little emphasis on the latter.

Inquiries which appear to be leading to future applications include the following: a school library media specialist who feels a background in information transfer is the best preparation for school superintendents; and an admissions counsellor who hopes to make sense out of the lack of communication among national departments of immigration, foreign relations, and educational establishments.

Sometimes, inquiries come to us which lead to applications to disciplinary programs. For example, to date one person decided to pursue a doctorate in Urban Education, with a library/information science minor, and another decided that the engineering aspects of computer science were what

he really wanted.

We feel it is important to note that, while most of the inquiries have come from those in the library field, about half of those who pursue the program beyond the very earliest stages are from other fields. Thus, as the program progresses, we anticipate that seminars in our school will become inherently more interdisciplinary themselves. And, as a not insignificant point, we are developing a much larger "presence" on campus as a result of this program. At the same time, however, there are some difficulties.

ISSUES AND CHALLENGES

While the tide of developing multidisciplinary doctoral programs is on the rise, there are many unsolved problems, or challenges, and yet unanswered questions. Our experience at UWM shows that it will be sometime before these problems can be solved. This section of our paper will describe these problems and attempt to provide possible solutions.

Recognition by the University

Recognition can be divided into two parts: by the University and by the profession.

Universities, as we all know, are very traditional institutions and are apt to change or respond slowly to change. There are faculty in traditional Ph.D. programs who view multidisciplinary programs as an invasion of their turf by other elements particularly those from the professions. This is most evident in the faculties of the colleges of liberal arts and sciences, many of whom consider themselves purists.

Some of them have gone on the offensive by lamenting multidisciplinary programs as back door entries to doctoral programs by individuals not admissible to traditional Ph.D.'s. The result has been more rigid standards and additional requirements, not imposed on M-D students.

Some of these purists who sat on M-D committees have now been convinced that the opposite is true; that MD candidates have to work harder, appease more faculty, satisfy more requirements and risk the chance of wasting their time and energy in the end. Thus, they have developed more respect for M-D programs, if not for the concept of interdisciplinary research in general.

This latter point has prompted some compassionate faculty to insist that a bridge should remain available for students who for some reason wish to go back to a traditional discipline. But this compassion, while commendable, may prevent total commitment to the program by hesitant students and may provide the needed excuse for an advisor who can not meet his/her obligation to the doctoral student in the M-D program.

The program at UWM has the disadvantage of insisting that a student must be admitted through a gateway represented by one of the existing (mono-disciplinary) Ph.D. programs. The alternative is to have a separate admissions committee affiliated with the Graduate School and the Graduate Faculty Council and reporting directly to the heads of these two bodies. In this case credit will go to the cooperating units which will be responsible also for recruitment, monitoring and supervising faculty members who participated in multidisciplinary studies, but whose departments do not offer the traditional mono-discipline Ph.D. At present, such faculty are not permitted to be chairs or thesis advisors. Thus, they get all the responsibility of supervising students and directing their course work and research and receive none of the credit which goes to the chair because of his/her affiliation with an existing doctoral program.

The number of credits in an M-D program could possibly be much more than a regular program since a student must satisfy a course plan developed by faculty representing a number of subject areas. While it is conceivable that a student can take 27-30 credits beyond the master's degree to satisfy the course requirement for the doctorate, a student in an M-D program will probably take nearly double the number in order to satisfy the course requirements for the doctorate.

A student in an M-D program will typically take courses that he/she did not take when pursuing the master's since they were not within his/her areas of interest. It is estimated that the number of credits needed to satisfy the M-D course requirement will be in the neighborhood of 30 to 80. This situation could possibly change as we get more students who are coming out of M-D master's programs. In the latter case the M-D doctorate becomes a logical extension to the M-D master's.

A good potential for the M-D could possibly be a student who completed a double degree program. At UWM we provide such programs. Students could simultaneously pursue their MLIS with one of the following degree programs: Geography; History; Urban Affairs; and Fine Arts (Music). It is possible that such a program could be extended to cover computer science, management information systems, communication, international relations and other fields.

In the above mentioned cases, it is possible that the number of credits required for an M-D doctorate could be reasonably less.

Recognition by the Information Profession

Unlike the sciences and certain branches of the social sciences in which multidisciplinary studies have taken place over the last decade (ecological studies, urban affairs, systems engineering, econometrics and others), information

science is a relative newcomer to the field. Since information science has been identified from its inception as a multidisciplinary subject, it is conceivable that M-D programs would strengthen this field and contribute significantly to its body of knowledge.

Only a few programs have truly involved a multi-disciplinary approach to information science with active involvement from other non-library/information oriented disciplines. The programs at Syracuse and Rutgers may involve some aspects of communication, but they can hardly qualify as multidisciplinary. Hawaii's program with its present structure and applicants' orientation and the program at UWM are good prospects for what could become a truly multidisciplinary approach to the study of information.

We have reason to believe that the rigors of the program and its multidisciplinary orientation will provide students capable of doing original research. Once graduates of M-D programs find their way to the faculty of library and information science and other information management programs, it is possible that they will influence these programs to the extent that an M-D approach to the information profession will be the norm rather than the exception. This will have a trickle-down effect on our master's degree programs. And, in the long run, this will save the graduates from defending their degrees and M-D programs in general.

This conference also constitutes a giant step in the direction of providing a forum to discuss the issues surrounding M-D programs. We hope that issues will be brought to surface for further discussion, problem-solving and educating the profession and our colleagues on the various faculty of the merits of our programs and their possible impact on the field of information management.

Administrative Issues

We should address the question of the relationship between the regular degree and the M-D program within the same school or department. In other words, what is the relationship between for example the faculty and program in computer science and the M-D in information science in which computer science is only one component of a student's work?

There is also the problem of certifying faculty for eligibility to serve on M-D doctoral committees and as advisors to doctoral students. In traditional programs faculty are selected by their peers in the same department or discipline to serve on doctoral committees. In our M-D program, this is a problem that has not yet been solved since no faculty from outside the traditional doctoral programs could chair the M-D doctoral committee or serve as thesis advisors.

Some of the administrative and academic issues that should be addressed are: the problem of protecting one's turf, admission of students, hostility towards M-D students, and a fear of

the new and unknown. The question of what constitutes "multidisciplinary" should also be addressed. Is it two programs getting together such as in Rutgers? Must an M-D program be structured or does it lose its strength and uniqueness when it becomes structured?

Financial Assistance

At present, the financial aid situation provides an excellent example of the problems of any inter- or multi-disciplinary program within a traditional departmental structure.

Research and other forms of financial assistance should be made available to doctoral students in the M-D program. This is easier said than done since most of the funds for fellowships go to traditional programs and their students with little leftover for new programs. With stronger involvement from the graduate school and possible reallocation of resources, the situation could be improved. But, there could be problems with subject-oriented departments arguing for their "share" of any such money.

CONCLUSION

Our experience with the multi-disciplinary doctoral programs in general and at UWM in particular shows that the future of these types of programs is very promising. New knowledge and discoveries in one discipline are impacting other disciplines and the interrelations among some disciplines are producing a new core of knowledge and new approaches to scientific discoveries and problem-solving.

As in any new and emerging field of study there are differences among universities in administering these M-D programs. There is also apprehension on the part of some who question or do not trust anything new or innovative. Younger students seem willing to put their time, energy and resources in the new M-D programs. They will be the leaders who will convince others, including faculty and hiring institutions, of the merits of M-D studies and research. This will hopefully solve the problems of recognition in the academy and professions.

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