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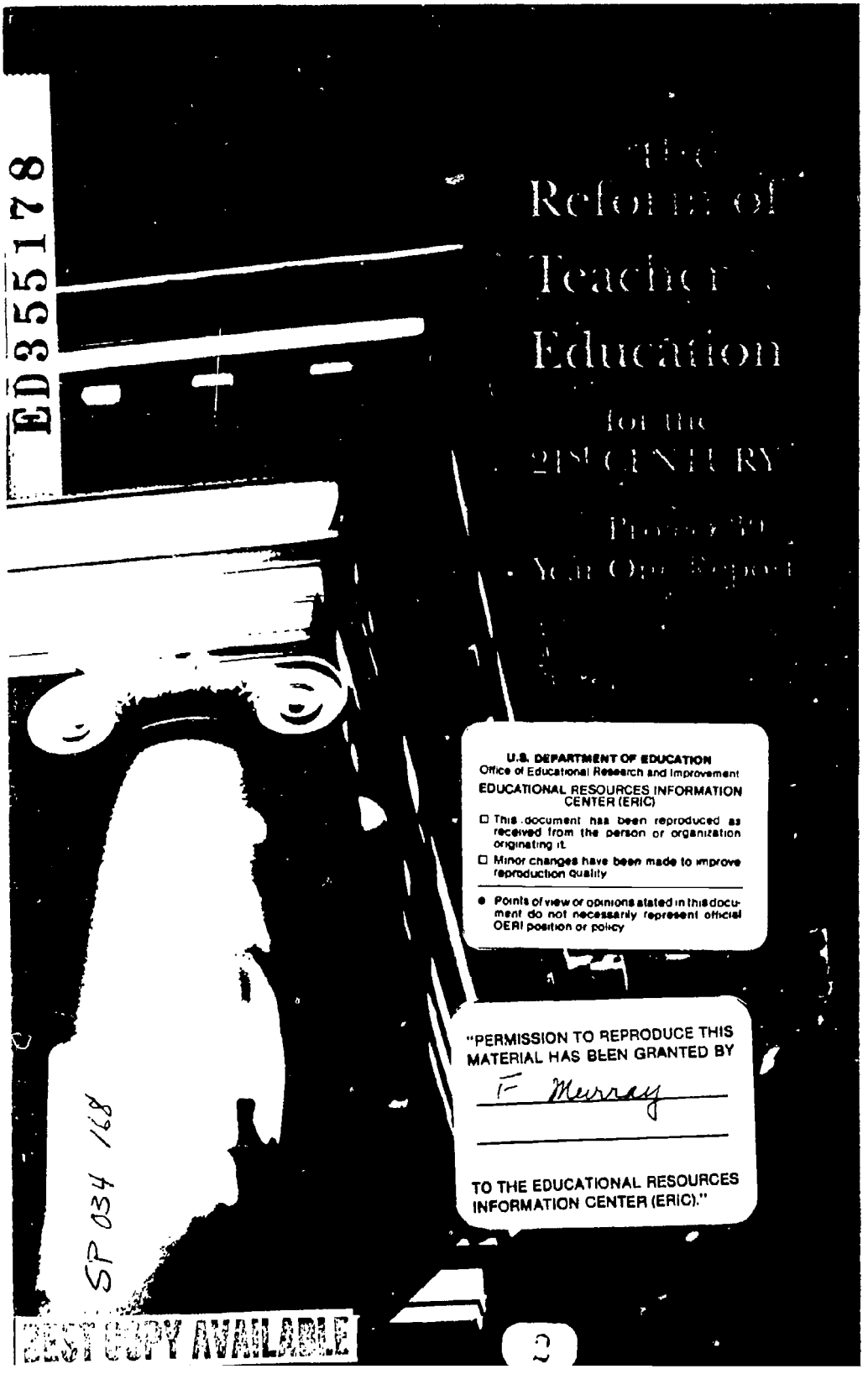
ABSTRACT

Project 30 is a collaborative effort involving 30 representative institutions of higher education whose mandate is the redesign the way that prospective teachers are educated at the nation's colleges and universities. Faculties of arts and sciences and faculties in education are engaged in joint action for fundamental reform. The 30 participating colleges and universities are a cross-section of all four-year institutions in the United States that prepare teachers for certification. This report takes stock of the status of Project 30 after a little more than 1 year, and identifies five themes or conversations taking place among faculties of the participating institutions in an attempt to clarify the intellectual underpinnings of teacher education: (1) subject matter understanding; (2) general and liberal knowledge; (3) pedagogical content knowledge; (4) multicultural, international, and other human perspectives; and (5) recruitment into teaching. Three years after its initiation, Project 30 will have begun reforms on campuses of participating institutions and will issue major publications calling for a national reform effort based on the work and ideas consolidated during the life of the project. Participating institutions are listed. (LL)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THE REFORM OF TEACHER EDUCATION FOR THE 21ST CENTURY: PROJECT 30 YEAR ONE REPORT

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PREFACE

Project 30, sponsored by Carnegie Corporation of New York, is a highly collaborative effort of 30 representative institutions of higher education to redesign the way that prospective teachers are educated at the nation's colleges and universities. What makes the project unusual is the full engagement of faculties of arts and sciences with faculties in education in joint action for fundamental reform. The project is directed by an arts and sciences dean designated by the Council of Colleges of Arts and Sciences, Daniel Fallon, and by an education dean designated by the American Association of Colleges for Teacher Education, Frank Murray.

Selected through an intense open competition that drew more than 600 inquiries and more than 100 final comprehensive applications, the 30 participating colleges and universities are a cross-section of all of the four-year institutions in the United States that prepare teachers for certification: they are large and small, private and public, urban and rural, and include many that enroll large numbers of minority students. **Project 30** reform initiatives center on five conversations taking place among the faculties of the participating institutions. These are about **Subject Matter Understanding; General and Liberal Knowledge; Pedagogical Content Knowledge; Multicultural, International, and Other Human Perspectives;** and **Recruitment into Teaching.**

In two years, three years after its initiation, **Project 30** will have begun reforms on the campuses of the participating institutions and will issue major publications calling for a national reform effort based on the best work and ideas consolidated during the life of the project. The report that follows takes stock of the status of **Project 30** after a little more than one year.

THE REFORM OF TEACHER EDUCATION FOR THE 21ST CENTURY: PROJECT 30 YEAR ONE REPORT

When will teaching take its place as one of the learned professions? This is a pressing educational question for the United States in the 21st century. Medicine moved from an

When will teaching take its place as one of the learned professions?

unrespected occupation of often-ridiculed nonprofessional status in the late 19th century to the very model of a profession in less than half a century. Even if teaching ought not to emulate medicine as a profession, it is still instructive to consider what it would take for teaching to follow the path of medicine or some of the other learned professions. The sheer size of the teaching workforce, of course, might limit certain aspects of professional status, like high income. There are now two and one-half million teachers representing 10 percent of the college-educated working women and 4 percent of the men. Nonetheless, why is it that other attributes of professional status, such as autonomy and prestige, have also eluded teachers, particularly public school teachers? Ironically, when an occupation that is essentially teaching takes on high status today it is no longer thought of as teaching, but as something else that is worth both high fees and the respect that comes from performing important work. Common examples of this include professional coaching in athletics or in the arts or the practice of psychoanalysis.

Why is it that attributes of professional status have eluded teachers?

Some assert of course that teaching is already a profession, and indeed it appears to have many of the appropriate attributes of the professions. Like the learned professions, teaching is connected to a university course of study. It is true that at the close of the Second World War the majority of American teachers, like physicians at the close of the Civil War, did **not** have a

university or college degree. Today, however, the majority of teachers in the United States have a master's degree. Moreover, as in the professions, the degrees are granted by institutions that are accredited in their entirety and in their specialties. Teacher education programs are approved by either the National Council for Accreditation of Teacher Education (NCATE) or the National Association of State Directors of Teacher Education and Certification (NASDTEC).

In addition, and again as in the professions, those who take professional teaching degrees are subjected to lengthy and varied written examinations of their knowledge and competence. Apart from their high school diploma examinations, prospective teachers invariably take a national standardized test of verbal and mathematical achievement, either the Scholastic Aptitude Test (SAT) or one administered by the American College Testing Program (ACT), as well as more than 100 hours of course examinations, graded by 40 independent evaluators, and in many cases the National Teacher Examination (NTE) or some additional test of basic accomplishment. All but six states now require at least one standardized competency test for admission to teaching. There are, as well, reviews by the hiring school district that often entail additional examinations. Even the granting of tenure and the permanent teaching license may be contingent upon the completion of the university examinations for the master's degree. Finally, the professional teacher associations, like the National Education Association (NEA) or the American Federation of Teachers (AFT), provide and encourage additional study through courses, workshops, and institutes that require additional examinations and demonstrations of the teacher's knowledge.

The common view is that the problem with teaching is that the wrong people are studying the wrong things in the wrong places.

Does this scrutiny by universities, national evaluators, state agencies, and lay boards provide assurance that teachers have the knowledge and disposition the public expects? Does it lead to any greater willingness to see the teacher as a professional? Almost no one outside the system thinks so. In fact, the common view, confirmed in the reform reports of the 1980s, is that the problem with teaching is that the wrong people are studying the wrong things in the wrong places. They are the wrong people because there is an over-representation of low scorers on any credible test of intellectual accomplishment. Nearly 40 percent of the bottom

20 percent of scorers on the standardized college aptitude tests are enrolled in teacher education. for example. Prospective teachers seem to be people who have, for whatever reasons, few other

Even the best schools spend disproportionately fewer dollars on their teacher education programs than they do on other programs.

options for white collar work. Moreover, teachers study the wrong things. They study too much pedagogy, a field that at best has slight claim to a scholarly base of knowledge, and they study too little of the disciplines that are, by contrast, well-grounded in long-standing traditions of scholarly work and substance. Finally, too much of the work is done in the wrong place—in the ivory tower—and not in field sites where there are clinical opportunities to validate and practice what has been learned in the college classroom. Worse yet, with about 1,300 teacher education institutions, compared for example with 172 accredited law schools, the teacher education ivory tower is of compromised quality in many instances. Even the best schools spend disproportionately fewer dollars on their teacher education programs than they do on other programs. The direct costs of instruction per year for educating a prospective teacher are half the costs of educating the typical college student.

Almost no one in authority inside the educational system holds the view that teaching is a professional activity.

Few outside teaching have much confidence in the teacher's "professional" preparation. More regrettable is the fact that almost no one in authority inside the educational system views teaching as a professional activity. Our system appears to presume that the wrong people have studied the wrong things in the wrong places because otherwise we would not need to "second guess" teachers on all matters we think are important. A clear example of our lack of confidence is that we hire, on the average, one professional to work outside the classroom to supervise and guide the work of each teacher who works in a classroom. Moreover, the regular assignment of routine, low-level nonteaching tasks to teachers, on the view that it is cost-effective to have the teacher do them, only confirms the conclusion that nowhere is teaching seen as a profession. As if this were not bad enough, all the formal requirements that outwardly seem to indicate that teaching is a profession—the degrees from accredited schools, the examinations, the certificates and licenses—are

routinely waived when there are shortages of teachers or other resources. Teaching is alone among the state-licensed occupations in granting substandard and emergency licenses.

Project 30 does not define a professional as one who holds all the knowledge—and therefore all the power—in the professional-client relationship.

Project 30 does not define a professional as one who holds all the knowledge—and therefore all the power—in the professional-client relationship. To do so would be to define the professional as a person who, as a result of having mastered the techniques and knowledge of the profession, is entitled to decide **alone,** or with other professionals, what is best for the client. Instead, **Project 30** takes the view that a professional will recognize the client's role as a partner. In fact, teaching may provide the model for a modern professional who is a catalyst for, rather than the cause of, the client's acquisition of knowledge or health or justice or salvation. The professional cannot act alone because a professional solution also depends on the client's consent, ability, and disposition. It is more accurate to think of the professional as one who arranges the conditions in which the client achieves such commodities as education, health, or justice. Within this framework **Project 30** seeks to establish the legitimacy of the claim that teaching is one of the learned professions.

The issues and problems raised are well beyond the expertise of the arts and science faculty or the education faculty to solve on their own.

Project 30 has identified five themes that are important in providing a context for the development of teaching as a profession. Through these themes the intellectual underpinnings of teacher education can be clarified, a step that is necessary for the future we envision. The issues and problems raised within each of the themes are well beyond the expertise of either the arts and science faculty or the education faculty to solve alone. Consequently, the engagement of faculties in the arts and sciences with faculties in education is essential to our strategy. As a result, these themes are called conversations between the faculties.

We have organized this report, after one year's work in **Project 30,** around the five conversations that have been taking place between liberal arts and education faculty in the **Project 30** schools. Each **Project 30** team has been charged with becoming a catalyst for reform on these conversation topics:

1. Subject Matter Understanding. Teacher education graduates must have a thorough knowledge of the discipline(s) they are licensed to teach, but we have found that the traditional college major in the teaching field is often insufficient preparation. The structure and purpose of the academic major must be rethought, especially as it applies to teachers.

The traditional college major in the teaching field is often insufficient preparation.

2. General and Liberal Knowledge. Teacher education graduates must be well-informed persons. The core curriculum or general education provided at the nation's typical colleges and universities is usually insufficient by itself to strengthen this essential component of professional standing in prospective teachers. Beyond being well-informed, however, teachers must have the habits of mind that have always been claimed for a liberal education if they are to become more than teaching technicians—persons who know how to teach, but who do not have a well-reasoned sense of the purposes of teaching or how to respond to novel educational problems.

Teachers must have the habits of mind that have always been claimed for a liberal education if they are to become more than teaching technicians.

3. Pedagogical Content Knowledge. Teacher education graduates must know how to convert their knowledge of the subject matter into a teachable subject for a wide range of pupils. This, the weakest link in teacher education programs, requires the most intense and lively cooperation between faculties in education and in the arts and sciences.

The college curriculum must be accurate with respect to recent scholarship on matters of race, gender, ethnicity and cultural perspective.

4. Multicultural, International, and Other Human Perspectives. For all persons, but especially for prospective teachers, the college curriculum must be accurate with respect to recent scholarship on matters of race, gender, ethnicity and cultural perspective. To make the curriculum accurate in this way is a massive undertaking because most higher education faculty were educated in a period when there was little sensitivity to, or awareness of, alternative perspectives in each curricular domain.

5. Recruitment into Teaching. The numbers and proportions of under-represented persons—minorities at all levels, talented persons at all levels, and men and women in selected areas where they are under-represented—must be increased. They must be increased for the right reasons and on a principled basis.

The matters we have taken up resist easy solutions and are worthy of continued analysis leading to fundamental reform.

The **Project 30** conversations on each home campus and among all the **Project 30** schools are designed to assure that tomorrow's teacher education graduates are learned persons who know how to teach well. Considerable progress has been made in the first year, often in unexpected ways along unexpected dimensions. At the same time **Project 30** discussions and plans have shown that the matters we have taken up resist easy solutions and are worthy of continued analysis leading to fundamental reform.

THE SUBJECT-MATTER UNDERSTANDING: ACQUIRING KNOWLEDGE OF WHAT IS TAUGHT.

Everyone agrees that teachers, regardless of what else they know, must know the subject matters they hope to teach their pupils. Criticism of a decade ago that teacher education programs were long on pedagogy and short on academic content has largely been blunted as most education curricula, particularly for prospective secondary teachers, have shifted to require a B.A. degree with an academic major in a subject-matter discipline. The academic major, however, is not by itself an adequate preparation in the subject matter the student will teach. By and large, these major programs do not induce in students the kind of penetrating understanding necessary to be effective teachers. As the **Project 30** schools have worked with this problem, they have not abandoned the concept of the academic major itself. Some, like **Pembroke College,** are seeking a framework that would support an additional academic major in the teacher education program. Overall, the effort has tried to make the major more effective, especially for teachers, who seek to acquire a special kind of integrative subject-matter knowledge.

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Proposed solutions have centered on new majors, interdisciplinary majors, and new types of courses within existing majors. The **Project 30** team at the **University of Texas at El Paso,** for example, has found 50 faculty from various departments to design interdisciplinary cores for prospective teachers. The **University of Maryland** has developed a "capstone" senior seminar for science majors in which the natural science disciplines are related to each other and to the other disciplines required in the **Maryland** general studies core. Both the **University of Georgia** and **Vanderbilt University** are revising entire blocks of natural science courses so that they will be responsive to the needs of prospective school teachers. **Georgia** is educating elementary teachers to have such a strong grasp of science that they can be resource teachers in their schools, and **Vanderbilt** is developing special laboratory sections for prospective teachers and supporting these sections with a comprehensive videodisc series in the sciences and mathematics. The **Project 30** team at the **University of New Mexico** has also attempted to employ technology to promote the surer grasp of mathematics and science by the prospective teacher. **New Mexico** plans to structure much of the mathematics curriculum around the notion of a graph. To facilitate the use of graphs throughout the mathematics and science curriculum, they will use graphing calculators, which give accurate and nearly effortless renderings of complex data, providing teacher education students with insights into science and mathematics that would otherwise be unavailable to them.

The case of the appropriate course of study for the elementary school teacher is particularly instructive for **Project 30** because it illustrates the knotty problems that arise when we examine how teachers acquire the wide range of knowledge they attempt to teach. In the case of the elementary school teacher we are hard-pressed to follow the implications of what we believe too far because it would mean that prospective elementary teachers would need to be well-grounded in mathematics, literature, writing, history, geography, the natural and social sciences, the fine arts, language, and much more. Several **Project 30** schools, like the **University of Delaware,** are investigating what kind of academic course of study could ever lead to such a comprehensive outcome in today's university—for anyone, let alone education students.

At the secondary level the matter is just as complicated for social studies or general science, which are informed by several distinct university subjects or majors, each of which is a full university course of study in its own right. How, in fact, does the elementary teacher, or the social studies teacher, come to know the very

material he or she teaches and, given the latitude in the elementary school curriculum, for example, how do teachers even figure out what that material should be?

Reasonably well-educated college and university graduates find themselves in great difficulty early on in their attempts to answer coherently, and with integrity, the questions that young children are likely to ask.

We do know that reasonably well-educated college and university graduates find themselves in great difficulty early on in their attempts to answer coherently and with integrity the questions that young children are likely to ask. Sooner or later, an elementary school teacher is going to tell children that the world, despite all appearances, is not flat. Upon learning that the earth is round and spinning, children will inevitably wonder why they don't fall off. Teachers, and virtually all educated persons, will say something about the holding power of gravity, and having said that, they have exhausted about all they know about this topic. They have no intellectual resources left to deal with other questions about gravity, such as whether gravity is stronger in the southern hemisphere, i.e., on the earth's bottom where it ostensibly has to do so much more work to keep everyone from falling off. In fact, there is some risk that gravity will be described as a magnetic force, which it is not, and thus the pupils will be misled about a point that will require correction if the pupil is to have even a rudimentary grasp of how the universe operates.

A traditional academic course of study does not always provide conceptual subject-matter understanding.

A traditional academic course of study does not always provide conceptual subject-matter understanding. The nation's "best and brightest" college graduates are, in fact, not well-grounded in some essential, but relatively simple, parts of the elementary school curriculum. A recent videotape done by the **National Science Foundation (NSF)** shows some of Harvard's graduating seniors being asked at their commencement how it is that we have seasons. Without hesitation and with confidence they each replied **incorrectly** that it was because the earth was closer to the sun in the summer and farther away in the winter. Yet each would no doubt know the distance between the earth and sun, that days are of different lengths, the shape of the earth's orbit, that the seasons differ by hemisphere, and so on—all facts

that, upon reflection, are inconsistent with their response. It would not be hard to document gaps like this that exist among our best and brightest in all aspects of the elementary and high school curriculum!

The nation's "best and brightest" college graduates are, in fact, not well-grounded in some essential, but relatively simple, parts of the elementary school curriculum.

Given the shortcomings of the traditional academic course of study, what hope is there for the elementary education majors—who are, as we have noted, not high scorers on any of the common standardized measures of intellectual aptitude and achievement—to master even the subject matters of the grade that they expect to teach? What kind of education, as only one component of a modern teacher education program, could provide the grounding in basic subject matters that would allow teachers to stand up to the ordinary questions they will receive from their pupils, let alone the exotic questions that would tax scholars in the field? How often can teachers simply say, "Good question, look it up," before they discourage all genuine questions from their pupils?

What kind of education could provide the grounding in the basic subject matters that would allow teachers to stand up to the ordinary questions they will receive from their pupils?

Within **Project 30** a variety of approaches are being pursued to improve the acquisition of subject-matter understanding for prospective elementary school teachers. Many of these solutions could also be applied to prospective secondary-school teachers or those interested in special education. Six of the more formally structured possibilities include an interdisciplinary major, four new academic majors, and a new academic minor.

1. Interdisciplinary major. For the elementary school teacher, this option is a collection of reworked minors in the school curriculum areas: mathematics, foreign language, history and social science, English, natural science, and fine arts. Within just the science portion of the elementary school curriculum, the **University of Wisconsin at Milwaukee,** for example, is developing thirteen one-credit mini-courses in the basic science content of the elementary school. Apart from the fact that each minor would be responsive to the unique requirements of the elementary school

teacher, the interdisciplinary minor option is fairly conservative and administratively feasible. It represents about 90 credit hours of focused study, an increase of about 30 credit hours for most of the nation's prospective elementary school teachers, but still affords only minimal levels of study in each area. Yet it is an honest approach insofar as each major area of the elementary school curriculum is addressed. Along these lines, **Texas A&M University** is piloting a course taught by a physicist in physics for elementary teachers. It will be followed by a related course taught by education faculty members. Some **Project 30** schools—**The University of the Pacific, Bridgewater State College, The University of Northern Colorado, California State University at Los Angeles, The University of Texas at El Paso,** and **Winthrop College**—have consulted with public school teachers to determine the nature of the subject-matter majors and minors and have not relied solely on the liberal arts and education faculty for guidance in this matter. **Weber State College** has created a Teacher Academy on its campus for outstanding regional teachers; the Academy focuses on a single discipline each year. This effort not only strengthens the teachers' career development but also provides an opportunity for the **Weber State** faculty to learn from them. **Memphis State University** has made a number of formal linkages with high school science teachers, including the establishment of a Project 30 Advisory Board, to develop a more collegial relationship.

2. Philosophy and structure of the subject matter major. This option might be a major in philosophy with an emphasis on the philosophy or basic structure of appropriate subject matters (e.g. the philosophy of science) in which essential and fundamental aspects of the subject matter are covered. The approach provides a structure to the separate minors described in the interdisciplinary major. **Brooklyn College** is implementing a sweeping set of interdisciplinary courses for prospective teachers organized around the faculty's view of the core dimensions of three comprehensive areas—the social sciences, the arts and humanities, and the natural sciences. The courses are structured around themes that grow out of the college's urban setting, such as the role of the social sciences in accounting for and explaining the nature of the immigrant and the generic process of immigration. From a different perspective, **SUNY Buffalo** has developed a freshman mathematics seminar in which this discipline is treated as one of the humanities.

3. Text approach or "great books" major. This approach entails an unusual course of study that contains a close reading of

seminal texts in each area (the "great books") coupled with an examination of school textbooks for the assumptions they make about the discipline in question. The logic of this proposal, like the philosophy-of-the-disciplines approach, is that the core structure of the discipline is addressed directly, and the "forest for the trees" problem that plagues most university study is minimized. **The University of Delaware** is currently piloting an honors mathematics course and an astronomy course that have these features.

4. Genetic epistemology as a major. This option entails the study of the developmental psychological literature from the perspective of the development of the concepts that make up the curriculum. In this approach, the student learns the relevant developmental constraints upon the child's acquisition of the curriculum and lays out, as an unavoidable part of the discussion, the nature of the subject itself. The story of how the young child develops the notion of number, for example, is valuable in its own right, but also reveals salient portions of number theory, the arithmetical algorithms, and other aspects of this branch of mathematics. Similarly, the account of the child's moral development reveals the principal issues in moral philosophy and political theory. **Vassar,** for example, has developed a science education course, Science and the Young Child, that is taught by a biologist and an elementary science specialist.

5. The cognitive psychology major. In this option the student would simply major in cognitive psychology and make the workings of the mind his or her specialization. The subject matter content would be picked up through the consideration of how the mind operates mathematically, aesthetically, and so forth. Like the philosophy-of-the-disciplines or text approaches, this approach would provide a structure for reformed minors in each subject area. Each area would be approached from the perspective of how we think about and know the content in question. The approach fits well with the current trend in cognitive psychology that stresses the domain specificity of our thinking. **Vanderbilt University** has developed a cognitive science major as an option for its prospective elementary school teachers, and **Winthrop College** has revitalized its science courses for elementary education majors in the light of the contemporary cognitive science literature of misconceptions in science. **Winthrop** has also attempted to apply a "learning cycle" model from the cognitive development literature to the instructional format of these science courses. From a different perspective, the **Vanderbilt** videodisc and

hypermedia innovations have included the expert-novice cognitive science literature in the integration of subject matter content and pedagogy.

Teachers inevitably transform what they know into a teachable subject.

6. The pedagogical content knowledge minor. This approach addresses the fact that teachers, even professors, inevitably transform what they know into a teachable subject. They give the subject a new structure and meaning, one that is appropriate to their students' level of understanding. These structures can be studied and codified. Since this reformulation of the discipline is inevitable in teaching, one might as well address it directly and, as in the other approaches, use it as a way to structure the academic disciplines. In teaching *Huckleberry Finn*, for example, the teacher inevitably interprets the book as a story of race relations, or generation gaps, or an historical period, or latent homosexuality on the frontier, or whatever. The academic minor would explicitly address how this is done. As another example, many science teachers attempt to clarify the nature of electric current by comparing it to the behavior of water currents in various sized pipes and so forth. Is this a good way to think about electricity? How would one know? The answer to the question is not to be found in physics or in education, but in a qualitatively different kind of knowledge that will come from conversations between disciplinarians and pedagogues. This knowledge—the

This knowledge—the knowledge of what is a telling example, a good analogy, a provocative question, a compelling theme—is a proper object of study.

knowledge of what is a telling example, a good analogy, a provocative question, a compelling theme—is a proper object of study. With new courses comprising an academic minor, it could yield a deep and generative understanding of the disciplines. To have multiple ways of representing a subject matter, to have more than one example or metaphor, to have more than one mode of explanation requires a high order and demanding form of subject-matter understanding. The **University of Pennsylvania,** for example, is redesigning some of its history and social science courses around themes found in the elementary school social studies curriculum. Along the same lines, **San Diego State** has formed triads of liberal arts faculty, education faculty, and public school faculty to develop pilot courses in history, biology, and mathematics for education students in their senior level of the

undergraduate program. The ways in which the public school teachers represent these academic disciplines have proved to be very useful to **Project 30** schools in their curriculum revisions.

These possibilities for an academic course of study for the prospective elementary school teacher reveal that the question of what constitutes the most appropriate academic major for a teacher is not as simple as requiring a regular academic major in some university subject. To require prospective elementary teachers to major in some field may be a good thing, but alone it cannot guarantee that they will acquire competence in the subjects they will teach their pupils.

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Several **Project 30** schools, as we noted, are experimenting with "capstone" courses that attempt to integrate the discipline's structure and show how the discipline fits with other bodies of knowledge. Others, like **Baruch College** and **Brooklyn College,** are thematically integrating the subject-matter disciplines with education by grounding the disciplines within the context of the College's location. This is done through the exploration of such problems as urban society, multicultural diversity, or environmental preservation. Still others are using the pedagogy of the discipline itself as a way to make the academic subject matters more comprehensible to the prospective teacher. Those **Project 30** schools that have developed subject matter courses for prospective teachers all report that these tailored courses are very well received by all students in the university—majors and non-majors alike.

GENERAL AND LIBERAL KNOWLEDGE: THE USES OF A LIBERAL ARTS EDUCATION IN TEACHER EDUCATION

Whatever else this decade's educational reform reports may have been about, they each made the unchallenged claim that teachers need to be well-schooled in the liberal arts. Rarely were reasons advanced for this claim, as it has an almost self-evident quality to it. When reasons were advanced, they were really in support of a somewhat different proposition, namely that teachers ought to be well-grounded in the subjects they teach to their pupils. This perfectly plausible proposition, of course, has nothing to do with the liberal arts, unless teachers intend to teach one or more of the

liberal arts themselves. Sometimes the claim for the liberal arts was made on the grounds that teachers ought to be well-educated persons, and well-educated persons are those, and only those, who were schooled in the liberal arts. Even here, there is confusion because being well-informed is not the same thing as being liberally educated. It is a mistake to imply that general and liberal education are the same. They are about different things—the first is about having good and dependable information, while the second is about knowing what the point of something is and what is worth doing.

It is a mistake to imply that general and liberal education are the same. They are about different things—the first is about having good and dependable information, while the second is about knowing what the point of something is and what is worth doing.

Rarer than arguments for the liberal arts as an indispensable component of teacher education programs—sometimes their only component—is any attempt in the reports to specify what the liberal arts are, how many there are, what domains of knowledge are represented, what is essential, what makes the study of some things liberal and others something else, and so forth. Kimball's *Orators and Philosophers*[1] superbly documented the complexity of the history of the liberal arts. It is hard to see how the historical record can support any single claim about the nature and function of a liberal arts education—either now or at some earlier golden period. With such a contested and uncertain foundation, how can teacher educators and others respond to the universal call to base the education of teachers on a firm foundation in the liberal arts?

Before the question can be answered, and before anyone's account of the evolution of our notion of the liberal arts and liberal education can be of service, at least three kinds of knowledge must be distinguished in teacher education:

1. the subject matter for which the teacher is directly responsible in the classroom;

2. the general education knowledge that defines what the well-informed person knows, apart from the knowledge and

[1]Bruce Kimball, *Orators and Philosphers: A History of the Idea of Liberal Education*, New York:Teachers College Press, 1986.

information the teacher is responsible for directly conveying to the pupils; and

3. the knowledge of the liberal arts that does not appear ever to be directly taught to any pupil.

How is the teacher's or the pupil's education served by the teacher's knowledge of the liberal arts as opposed to the other forms of knowledge? The case for subject matter knowledge is conceded by everyone and is a complicated issue in its own right, as many of the **Project 30** schools have discovered. The general knowledge component, by all accounts, enhances the teacher's image as an educated person, but as the material is not required to be taught directly, the benefits to the pupil are not immediately apparent. If the teacher knows his or her subject matter and is reasonably well-informed about other matters, what else can the liberal arts contribute to the teacher's work?

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Orators and Philosophers describes two distinct forms of liberal arts education. One is the **orator** tradition, in which the teacher learns to speak the truth about the best and most noble of what is known so that the pupils will act virtuously and govern themselves wisely. The other is the **philosopher** tradition, in which the teacher's, and subsequently the pupil's, honest and unending pursuit of truth is the outcome of a liberal education. Implicit in the orator tradition is a commitment to a canon of the best of what is known and thought. No such commitment is required in the philosopher tradition other than the mastery of the modes of inquiry, some of which are naturally a part of the orator's canon. In an important sense these two traditions are parts of a whole. It may, therefore, be meaningless to ask whether teacher education should be anchored to one or the other. It does make sense, however, to secure an anchor for teacher education firmly in liberal arts education, because both the orator and philosopher traditions are essential to good teaching.

A number of historical claims have been made for the benefits of studying the liberal arts:

1. They are subjects that are worth knowing for their own sake; they are ends in themselves, activities that make human life complete.

2. They are studies that are appropriate for the free person, the person who is free of utilitarian concerns, free from the need of labor; in other words, they are studies that are appropriate for leisure.

3. They are studies that promote the full realization of what it means to be human and intelligent; studies that support the selection of wise and good ends for the community and oneself.

4. They are studies that set the student free—free from the bondage of convention, unanalyzed custom and opinion, free of the tyranny of dogma and assertion, and free to search out and construct truth.

5. They are studies that make a difference when they are expressed; they have an effect of persuading others to take up virtuous and just courses of action, and they yield good citizens who can lead the society wisely and to good ends.

6. They are studies that show the student how, by the power of human reason, to search for and construct truth—truths not heretofore known and truths that are inevitably provisional because all the thinkers have not, and cannot have, completed their work.

7. They are studies that enable one to tell the truth eloquently about the most durable and best of what we have learned.

The claim that teaching is a profession and not merely an occupation informed by precise rules and procedures for accomplishing the desired outcomes stems from the fact that the teacher must rely upon other bodies of knowledge, besides pedagogy and teaching technique, to teach.

Most important, from the perspective of **Project 30**, is the claim that the liberal arts take us beyond mere teaching technique and procedure to the invention and understanding of good ends and to a clear conception of the good and proper outcomes of teaching. This is the kind of knowledge that directs and guides the wise use of teaching techniques and practices and helps the teacher find solutions to novel problems. The claim that teaching is a profession and not merely an occupation informed by precise rules and procedures stems from the fact that the teacher must rely upon other bodies of knowledge, besides pedagogy and teaching technique, to teach.

The nature of these "other bodies" of knowledge and their connection to the classic liberal arts are difficult problems for the **Project 30** schools, but they are problems for which we must find solutions. The examination of the **ends** of schooling and teaching is an essential part of **Project 30** because as long as the nature of these "other bodies" of knowledge remains unclear, teaching cannot be a genuine profession. The case, frequently made in reform literature and legislation, that the liberal arts or liberal education can strengthen teacher education is, no doubt, correct. Nonetheless, this case is poorly understood and still requires careful analysis.

The **University of Dayton** has taken on the problem of integrating liberal learning with professional education and has, through the design of an "Education Core Program," attempted to show the coordination of the structures of the different disciplines and has then attempted to link this knowledge with a knowledge of domain-specific pedagogy, classroom organization, and human development. In this regard, several **Project 30** schools have taken university-wide approaches to the connection between liberal and professional knowledge. The **University of Northern Colorado,** for instance, cancelled all classes for half a day so the entire university could focus on teacher education by forming twelve discipline-based task forces of faculty, students, and public school teachers. Other schools have focused more precisely on the particular elements of the problem. The **University of Pennsylvania** is developing a course, The Teaching of Thinking, and is encouraging prospective teachers to actively participate in educational research. Research is also central to the work at **Indiana State University,** but there it is a device to forge links between liberal arts faculty, education faculty, and schoolteachers—all of whom will collaborate on research projects on the teaching of subject matters.

While the actual content of the liberal course of study may be somewhat arbitrary, its outcome is not—it must take even the successful teacher beyond technique and algorithms.

The claim for a liberal education component in teacher education is central to the claim, or aspiration, for teaching as a profession. It is a claim for more than "decorative" learning or tradition, although unfortunately some reform reports anchor the desirability of liberal education in a "high culture" tradition alone. While the actual content of the liberal course of study may

be somewhat arbitrary, its outcome is not—it must take even the successful teacher beyond technique and algorithms.

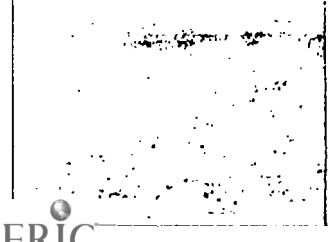
Though not widely appreciated in this regard, the so-called foundations courses in teacher education are also properly a part of the liberal arts component. Rarely do these courses have direct relevance for the classroom and they are therefore often criticized by teacher education students and teachers in the field. It is a misguided criticism, however, because these courses offer explanations of schooling, not prescriptions or remedies for schooling. Their function in the teacher education program is the same as the claims made for the function of the liberal arts; thus, these courses should be held to the standard we set for the liberal arts component.

Finally, the liberal arts course of study, regardless of the particular subjects studied, should confer certain attitudes and dispositions on those who study them. Among these is an attitude of freedom from *a priori* constraints and assertions; a belief in the centrality and efficacy of the intellect and the power of reason; a pervasive skepticism about any answer being a final answer; a tolerance of contrary views and positions; an egalitarianism of thinkers and learners; an overriding value on individual autonomy, development and accomplishment; and finally, the sense that the pursuit and construction of truth is more important in the end than the discovery of "the truth" because truth is always provisional, awaiting the results of subsequent investigations and analyses, and contingent upon the experience and actions of the student and investigator.

PEDAGOGICAL CONTENT KNOWLEDGE

All teachers know that the subject matter they teach is different from the subject matter they learned from their own teachers. The teacher inevitably transforms the subject matter into something else—a teachable subject that has its own structure and logic and makes sense to the pupil. The knowledge that supports this conversion of the store-house of knowledge into the school curriculum, into something that has meaning for the pupil, is what we mean in **Project 30** by the expression, "pedagogical content knowledge."

What does the mathematics professor know about mathematics that the mathematician does not know?



At the college level this knowledge should distinguish the mathematician from the mathematics professor, who knows something more than a mathematician knows, although he or she is a mathematician as well. What does the mathematics professor know about mathematics that the mathematician does not know? He or she knows how to explain mathematics, how to represent it in ways that are accessible to students, and how to show someone how to do mathematics.

Educational critics often say that, owing to the low quality of teaching, school pupils and university students are driven to memorize by rote large portions of the curriculum, with the point of education being little more than to return this rotely memorized and undigested material to the teacher on an examination. However, we know that the human mind cannot memorize very much material by rote, in fact probably not much more than a half-a-dozen unrelated items at a time. We know that even the marginal pupil who confronts the massive amounts of material in the school and university curriculum finds a way to impose some structure, some organizational scheme, on the material. The question is never whether or not there was some structure, theory, scheme, etc., but only whether the structure was good or poor. Whatever the teacher actually did in the lesson, the pupils will find some way to make sense of it, to code it, to assimilate it into what they already know, often with an outcome the teacher may never have intended. The nearly universal "error" of the pupil's mistaking Martin Luther King for Martin Luther in the world history class is just one of a thousand examples, many quite humorous, of the pupil's often desperate attempt to make sense of what is presented by the teacher.

We know that even the marginal pupil who confronts the massive amounts of material in the school and university curriculum finds a way to impose some structure, some organizational scheme, on the material. The question is only whether this structure is good or poor.

In the end, the discussion of pedagogical content knowledge becomes a discussion of the appropriate ways of organizing information and knowledge. It is the search for structures, ways of representing the subject matter, analogies and metaphors, that will take each pupil well beyond what can be held together temporally and spatially through rote memorization. At the lowest pedagogical content knowledge level there are mnemonic

structures that can carry the student past the half-dozen rotely memorized items, but these structures accomplish very little other than improving retention and defending the memorized items against the rapid forgetting that is the hallmark of most rotely learned material. The mnemonic device, "roygbiv" can provide the student with the order of the spectral colors. Like all mnemonic devices, however, it fails to provide understanding—it gives no clue about how or why the phenomenon takes place, or why the order is reversed in the second rainbow of a double set, and so on. Knowing the order of the colors can be very helpful and may be essential information for the solution to many higher order problems, for example, but we want more than this. Pedagogical content knowledge is fundamentally concerned with those structures that confer some appropriate level of understanding, and it is ultimately concerned with those structures that actually advance our understanding.

At several **Project 30** schools the special competencies of the education and arts and sciences faculties have already come together in the discussion of pedagogical content knowledge as they try to determine such things as whether the hydraulic metaphor for electric current is a wise choice or whether electricity would be better represented as a flow of free and unbounded electrons, or as something else entirely. Should light be portrayed as a wave, a particle, or a mental event? Should the social studies teacher represent history as chronology, as biography, as the re-creation of the past, as a moral lesson, as the predictor of the present, or as the manifestation of some deep underlying forces and mechanisms? Would art be better presented as decoration, a celebration of the meritorious, a rendering, or an intellectual and aesthetic solution to some problems of light, space and time? Should fractions be abandoned altogether and replaced by decimals throughout the curriculum? There is no end to the examples, and it is clear that the solution to the each problem requires the expertise of disciplinarians and pedagogues.

To date, some **Project 30** schools have developed interdisciplinary pedagogical content knowledge courses that are taught by teams of educational methods faculty and traditional arts and science faculty or, in the case of **San Diego State,** by teams that include a high school teacher. **Millersville University** has developed a set of pedagogical content knowledge seminars, known as "PG" seminars, that are associated with a traditional arts and science course but are taught by both a liberal arts faculty member and an education faculty member. The subject of discussion in the

"PG" courses is the liberal arts faculty member's teaching—the decisions made, the examples and metaphors that were chosen or discarded, and so forth. These are really case studies of university teaching in each discipline. A similar approach has been used by **Brooklyn College** in its invention of "Studio Courses" that are connected to their new interdisciplinary subject matter courses. The traditional work in the education major will be covered in the "Studio Course," but in the context of each discipline's connection to the teaching arts.

While **Millersville** is mining the minds of its liberal arts faculty for case knowledge of how good teachers teach, other schools, like **Bridgewater, Winthrop, San Diego State,** and the **University of the Pacific** are searching for this information with elementary and secondary school teachers. One school, **SUNY Buffalo,** is approaching the pedagogical content knowledge issue through the study of graduate teaching assistants. At **Buffalo,** the dean of the school of education has participated in a case study group, led by a distinguished teaching professor of biology and devoted to the systematic training of teaching assistants. In the next phase of the work, case studies will be developed from pre-service social studies teachers who will serve as teaching assistants for a new World Civilization course at **SUNY Buffalo.**

Discussions of pedagogical content knowledge are at the heart of our work and cannot be avoided.

We have often noted in **Project 30** that the discussions of pedagogical content knowledge are at the heart of our work and cannot be avoided. We know that the young elementary school child will be taught one of the algorithms for subtraction—but which one, decomposition, equal additions, rule of nine? The matter must be, and will be, decided. Similarly, we know that we will teach *Hamlet* at some point, but how should it be represented—as the use of language to talk about language, the pathology of indecision, the unconscious mind of the adolescent, the re-creation of an historical event?

The pedagogical options merit study by an approach that is as serious as the approach to any question in any academic discipline.

We need to enrich the discussion of pedagogical content knowledge with the notion that some structures are scaffolds, and as scaffolds they are provisional and designed solely to advance the pupil to another place. Thus, it may be appropriate to introduce the "1812 Overture" and, by implication, all classical

music, as the re-creation of an event, as programme music, in which the two national anthems battle each other in the overture as the armies did on the battlefield. This representation, or structure, which is hopelessly inadequate for any later understanding of musical composition, may provide a beginning scaffold that will engage the pupil. In the teaching of descriptive statistics, for example, it may make sense to introduce the notions of central tendency and variation with physical models of equilibrium, or with computer graphics representations of data points, or as calculation formulae, or as the solution to certain questions in the behavioral sciences, or as derivations of algebraic equations, or as part of a system of expressions in calculus or some other branch of mathematics. These pedagogical options merit study by an approach that is as serious as the approach to any question in any academic discipline.

At the cutting edge of a discipline, pedagogical content knowledge and theoretical breakthrough may be the same thing. The "double helix," for example, was as much pedagogical content knowledge as a Nobel Prize winning description because it provided a means for researchers to teach each other to converse about the genetic code.

While all the **Project** 30 schools have seen that the explication of and provision for pedagogical content knowledge in the teacher education program is the heart of the reform we seek, few have seen that this kind of knowledge advances the academic discipline itself. At the cutting edge of a discipline, pedagogical content knowledge and theoretical breakthrough may be the same thing. What happens on the frontiers of a discipline? The researchers invent ways to communicate with each other about the phenomenon under study; they invent ways to make sense of the phenomenon. The "double helix," for example, was as much pedagogical content knowledge as a Nobel Prize winning description because it provided a means for researchers to teach each other to converse about the genetic code.

Success, moreover, will inevitably depend upon the teacher having **multiple** analogies and representations of the subject matter.

When the teacher invents a structure that organizes and gives meaning to a field of study, he or she is doing **exactly** what the scholar or researcher does when the scholar provides a novel or generative structure for his or her peers about some problem in their field. It would be hard to know what kind of contribution, for example, William James's *Psychology* made—was it a contribution that virtually established the discipline itself, or was it a contribution to pedagogy insofar as it clarified and shaped a large body of heretofore unformed and unstructured facts and findings and made these accessible to students for over sixty years? Thus, the study of pedagogical content knowledge can be on the cutting edge of a field, insofar as new modes of representing the subject matter and making it interesting and meaningful are formulated.

Contemporary educational and cognitive research does give a few clues to the invention of pedagogical content knowledge. Lee Shulman[2] sees that successful pedagogical outcomes in this area will avoid oversimplification in the early metaphors and analogies. Success, moreover, will inevitably depend upon the teacher having **multiple** analogies and representations of the subject matter. Successful approaches will exhaustively bear down on a few particular cases, or phenomena, so that each becomes well-understood because it has been fully examined from several perspectives. In this sense, in the elaboration of pedagogical content knowledge, **less is more.** The issue is not a trade-off between breadth and depth, but rather the invention of structures that bring events into focus and clarify them. The focus can be lost in a bewildering array of detail if teaching pursues events at too much of a micro-level; similarly, the attempt to take in the whole field of vision may blur the image. The teacher's effort should be at the point of focus, the point where compelling metaphors and analogies have been invented. It is a matter of whether we have big or little structures, structures that cover a lot of things (epochs or eras or kinetic molecular theory) or single events (like angles of incidence and reflection).

[2]Lee Shulman. Toward a Pedagogy of Substance, *Bulletin of the American Association for Higher Education*, Volume 41, No. 10, July 1989, 8-13.

MULTICULTURAL, INTERNATIONAL, AND OTHER HUMAN PERSPECTIVES: QUESTIONS OF THE ACCURACY OF THE TEACHER EDUCATION CURRICULUM

Consider the fact that at the present time 81 different languages are spoken by the pupils in the Los Angeles schools, with as many as 20 different languages spoken in some classrooms. Or consider the fact that by the 21st century 40 percent of the nation's pupils will be minorities while 95 percent of their teachers will be white; this means that most pupils will not be taught by a single minority teacher at any time in their school career. There is no obvious way for teacher educators to avoid these facts. Tomorrow's teachers will face classrooms of pupils that will be markedly more diverse and varied than today's classrooms. Tomorrow's teachers and tomorrow's pupils will be very different from each other.

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By calling explicit attention to questions of cultural diversity within the nation and around the globe, **Project 30** is an exception to many of the other teacher education reform initiatives, which have either been silent on the question or given it a low priority in their reform agenda. The issue of cultural diversity, as framed in **Project 30**, is not a peripheral matter or a desirable add-on in teacher education; the issue is at the heart of the reform of the courses of study in both education and the arts and sciences. How could it be otherwise when the honesty and accuracy of the curriculum is at stake? The charge that higher education is parochial and insensitive to international and global matters as well as to matters of significance to the nation's many minority groups is fundamentally a charge that the curriculum is wrong, the very thing it cannot be! And if it isn't explicitly in error, it misleads students by its failure to challenge deliberately the student's stereotypical views on all matters in the curriculum.

The issue of cultural diversity is not a peripheral matter; the issue is at the heart of the reform.

Project 30 insists that all claims made in the curriculum be qualified by confirmed scholarship on race, ethnicity, gender, and cultural perspective. We soon see that claims for a monolithic

western civilization need to be qualified by a great number of facts: Beethoven's ninth symphony contains Turkish marches; statues of Buddha are found in Viking graves; mosques become churches and back again; and like the northern rim, the southern and eastern rim of the Mediterranean Sea contributed to the canon. We mislead our students when we leave out the facts that early Africans were using iron while early Europeans were using stone, that learning centers existed at Timbuktu and Sankore when the great European universities were just beginning, or that science and mathematics flourished in the Orient, South America, and Africa before the Greeks and Romans codified parts of these disciplines.

It is wrong to give the impression that the only female 19th century writer was Emily Dickinson or that Mary Cassatt was the only female impressionist painter. The range of literary genres, for example, is extended profitably beyond fiction, poetry, and drama to include journals, diaries, and letters when the literary work of women is seriously considered. The discipline of psychology turns out to be very different from what is presented in the standard introductory textbook when it is qualified by the contributions of black psychologists, as Robert Guthrie brilliantly observed in *Even the Rat was White*[3].

The study of minority issues or the study of global or international issues will fail, as they have in the past, if they are not anchored, passionately and with conviction, in the core values of the academy.

The point is that the study of minority issues or of global or international issues will fail, as in the past, if they are not anchored, passionately and with conviction, in the core values of the academy. Attempts to secure a place for these matters in federal law and regulation, in arguments about compensation for past injustice, in assertions about fairness and decency, in appeals to the specter of failure in the international markets, or in the realization that minorities can exert political power over the allocation of public dollars may produce short-term gains. They will fail ultimately to win a place for cultural diversity in higher education, however, because the effort can be deflected so easily by its critics when it is based on these short-term considerations and arguments. Laws and the enthusiasm of regulators change and

[3]Robert V. Guthrie, *Even the Rat was White: A Historical View of Psychology*, New York:Harper & Row, Publishers, 1976.

wane, for example, and then where are we in the overriding effort to correct the curriculum? Fairness and decency may lead to a "color-blindness" based solely upon performance that actually reduces diversity and re-segregates disciplines along racial and gender lines. Compensation for past injustice cannot really be made, and if it could, one would not know when it was complete or how to think about some minorities who were actually favored at some point in their history. Moreover, the diversity in the educational history of the various American minority groups is too complex and inconsistent for such an approach.

The stories of the various European immigrant minority groups, the various Native American groups, the various groups of Black Americans (e.g., African, Jamaican, Haitian, Melanesian), the various Hispanic groups (e.g., Mexican, Cuban, Puerto Rican, Dominican, Spanish-Portuguese) are each unique. It would be a mistake to consider any one of these groups to be a homogeneous unit because there are important differences within each group across geographical regions and between socio-economic levels. The record of minority experience will not support wholesale interpretations offered in the politics of liberation or in the politics of oppression. Nor will it support the alleged advantages of any group's enduring cultural identity or the melting pot arguments for the necessity of a single national identity.

The core values of the academy are enhanced by the inclusion of more groups.

The one sure anchor for international education and the study of cultural diversity is the core value of the academy, namely the pursuit of truth. The odds for success in this pursuit, for truth yielding its secrets, go up significantly when multiple perspectives are brought to bear in the search. At each stage of cognitive development, moreover, an individual's cognitive growth is enhanced by the confrontation of divergent views, by the clash of paradigms and theories. The history of the great universities is largely the story of an ever widening inclusion of different groups and views—inclusion based in part on inclusion as a value in its own right. More important, the core values of the academy are enhanced by the inclusion of more groups—both among students and faculty—in the quest for a more coherent account of the world. Intellectual evolution, like biological evolution, is enhanced by a base of variability, a base of multiple perspectives and interests, a base that contains many different candidates for success.

The team at the **University of North Carolina at Chapel Hill** has made this theme the focus of its work; they are devising ways to infuse the major freshman courses with information about race and gender issues. They have been conducting workshops that have school principals and teachers as participants, with a view to staffing and developing special sections of courses that will pursue in greater depth the multicultural issues in each discipline. Within **Project 30**, a subgroup—called **Project 5 (Bridgewater State, Vassar College, University of Pennsylvania, Baruch College,** and **Howard University**)—has formed to work on multicultural and recruitment strategies, and **Howard University** hosted the subgroup's first meeting. **Saint Mary's University** has joined with three junior colleges in the San Antonio region to team-teach a multicultural course that will cover Anglo, Black, and Hispanic cultures of the American Southwest. Prospective teachers at **Saint Mary's** will supplement their coursework with volunteer work in health clinics, shelters for the homeless, literacy programs, and county hospitals. The **Santa Clara University** team has revised courses in history, ethics, and English to include more multicultural and global information and thinking. **Weber State College** has approached the issue through pairing international students with elementary education majors; each member of the pair tutors the other about his or her respective homeland's history, culture, and geography. The quality of the tutoring, in fact, was at a level that warranted the production of curriculum guides.

The five themes or conversations of **Project 30** are interdependent, with the conversation about cultural diversity and global perspective being an essential precondition for the teacher's study of subject matter, for the study of the liberal arts to carry the teacher beyond mere teaching technique, and for the invention of pedagogical content knowledge to guide instruction of pupils of the 21st century.

RECRUITMENT INTO TEACHING: INCREASING PARTICIPATION BY UNDER-REPRESENTED GROUPS

Everyone laments that more of the nation's best and brightest do not elect a teaching career, and everyone knows that teaching, as it is currently organized, will not attract an increased share of the nation's best and brightest. As it is, only 10 percent of the top 20 percent of test takers enroll in teacher education. Further, there is not only an under-representation of high scorers but also, as we noted earlier, an over-representation of low scorers.

Teaching, as it is currently organized, will not attract an increased share of the nation's best and brightest.

Teaching has always provided a sure route for the members of the lower socio-economic groups in the United States to move up. There has always been an over-representation of lower SES groups and first-generation college graduates in the American teaching workforce. At the beginning of the decade almost 20 percent of all teachers' mothers had completed only grade school (or less), and over 70 percent had not ever attended college. Only 40 percent of their fathers had been to college, the majority being skilled and unskilled laborers and clerical or sales workers.

There has always been an over-representation of women in teaching, particularly in the elementary school. There is nothing in the current statistics on teacher education students to suggest that the composition of the workforce will change very much in the next decade. Roughly 76 percent of the nation's teacher education students are women, and over 90 percent of our teacher education students are white (4 percent are Black, 1.5 percent Hispanic, 2.5 percent Asian, and 0.3 percent Native American). Currently nearly 20 percent of the students in the public schools are Black and 10 percent are Hispanic and these proportions are expected to increase sharply by the end of the next decade. As only 3 percent of the nation's Blacks who are attending college are enrolled in teacher education, it seems sure that there will be even fewer minority teachers in the near future. The patterns of over- and under-representation of groups in teaching are clear, and almost everyone sees them as a major problem and barrier to the goals of educational reform—there are too few minority teachers, too few men, and too many academically untalented persons.

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What can be done about it? **Project 30** schools, and many others in the country, are pursuing a number of straight-forward strategies—scholarships, internships, earlier recruitment and identification of minority candidates, on-campus summer

recruitment programs, Future Teachers of America programs in the public schools (even in the junior high schools), multicultural courses, alternative certification programs, workshops on racism, faculty mentoring programs between institutions, collaborative recruitment programs, better guidance counseling in the lower grades, elimination of racially sensitive screening tests, and more. Some **Project 30** schools have uncovered promising new approaches to recruitment. For example, **Texas A&I** is concentrating its efforts on teacher's aides in rural South Texas, nearly all of whom are Hispanic women. Consequently, **Texas A&I** is adapting its program to accommodate these students, who are older, often mothers, and whose husbands are skeptical and suspicious about the workings of higher education. Other schools, like **Saint Mary's** and **Vassar,** believe the junior college and community colleges are an excellent and untapped source of potential teacher education students. **Southern University at New Orleans** recently hosted 50 high school seniors at an orientation to the teaching profession. They have also made an agreement with the New Orleans schools to identify tenth graders who are interested in teaching. One **Project 30** school, **Weber State,** has plans to enter into an exchange program with another **Project 30** school, **Florida A&M,** precisely because this arrangement offers a rich pool of minority students and faculty.

While it is true that minority pupils generally achieve more with minority teachers, teacher education must equip majority teachers with the skills and dispositions needed to maximize the performance of their minority pupils.

All these programs, some already implemented, must be placed in a perspective that acknowledges a few key social realities. Career opportunities for talented minorities are excellent, and the under-representation of minorities in all the professions is at least as severe as in education. Teaching was, after all, open to minority participation before minorities had the additional professional career opportunities that are currently available to them. While it is true that minority pupils generally achieve more with minority teachers, teacher education must equip majority teachers with the skills and dispositions needed to maximize the performance of their minority pupils. A thorough study of the research literature on teacher expectations of pupil achievement, for example, is an essential component of all teacher education in this regard. Not only must prospective teachers be aware of the educational consequences of their holding low expectations for some pupils'

achievement, but they must practice teaching techniques, including some that are counter-intuitive and demand steady discipline, that genuinely include the children for whom they have low expectations in the work of the class

Finally, we must make sure that the arguments and programs we advance for the greater participation of some under-represented groups in teaching are applicable to all under-represented groups.

SUMMARY: THE INTERDEPENDENCE OF PROJECT 30 GOALS

The **Project 30** themes and conversations are not independent. One cannot succeed with some while ignoring the others. To fail to recruit under-represented groups into teaching threatens all the other goals, particularly the goal of accuracy of the curriculum with respect to gender, ethnicity, and culture. Pedagogical content knowledge is dependent upon an accurate curriculum as well as mastery of the subject matter and the benefits claimed for the liberal arts. Similarly, a liberal arts education requires the professional and subject matter component, and it cannot exclude any group or perspective and still bring about the ends for which it was instituted.

The Project 30 themes and conversations are not independent. One cannot succeed with some while ignoring the others.

The hopes for a genuine teaching profession rest upon the reform of the relations between teacher education and the arts and sciences, as well as on reforms within each. These reforms are proceeding painstakingly within the colleges and universities that comprise the **Project 30** initiative. Some of the teams of arts and sciences and education faculty members have made greater progress in one area than in others. Indeed, a few appear on the threshold of significant breakthroughs. All the teams have gained confidence in the value of the five conversations and have begun to form new communities of discourse on their campuses that support the reforms they are introducing. From this national effort we can take heart that the elements of a new teacher education curriculum are being forged and that the foundation for a profession of education is being built.

The hopes for a genuine profession of teaching rest upon the reform of the relations between teacher education and the arts and sciences, as well as on reforms within each.

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37

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45
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