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I. The Challenge of Substance Facing Higher Education

Introduction

An eminent scholar of Greek civilization once defined education as the expression of a community’s awareness of a goal or standard for its collective life (Jaeger, 1945). In other words, that which is done in the schools, colleges, and other social agencies reflects the standard of living that a community believes should be achieved by its citizens.

If one accepts this definition of education, then one can only be encouraged by the
many recent calls for reform in higher education, for they seem to reflect an awareness on the part of society of a higher standard to which we would like our colleges to aspire. Furthermore, judging from the written reports, this higher standard concerns the very purpose and content of higher education more than its organization or administration.

Professional educators have taken seriously these calls for reform. In addressing the 1987 annual meeting of the Council for the Advancement and Support of Education (CASE), Derek Bok, president of Harvard University, said, “The current challenge to higher education is not merely a challenge of public relations, but a challenge of substance, and we must treat it as such” (Desruisseaux, 1987, p. 1). As a symptom of the underlying problem, Bok cited the subtitle of the best-selling book at the time, The Closing of the American Mind: Education and the Crisis of Reason (Bloom, 1987).

The “challenge of substance” to which Bok refers we take to include two related challenges: first, higher education is being challenged to provide students with more profound and meaningful knowledge; and second, it is being challenged to develop students’ abilities at deeper and more powerful levels. Both the knowledge and the organizing power that knowledge brings must be strengthened.

In the same year that Bok spoke to CASE, the Carnegie Foundation for the Advancement of Teaching and Learning published a progress report on American colleges by Ernest Boyer (1987). In the introduction Boyer echoed the same concern for substance when he wrote,

The nation’s colleges have been successful in responding to the diversity and in meeting the needs of individual students. They have been much less attentive to the larger, more transcendent issues that give meaning to existence and help students put their own lives in perspective. (p. 7)

The Carnegie Foundation report listed many specific concerns, including the gap between high school and college, the parochialism of most colleges, and the fragmentation of the curriculum. Underlying these concerns, however, was the suspicion that too little was being expected of a college education. As Boyer noted, “It is not that the failure of the undergraduate college is so large but that the institutional expectations are too small” (1987, p. 2).

This “challenge of substance” is expressed also as an increased interest in the measurable outcomes of college. Whereas before college outcomes were the interest of researchers alone, in the last decade taxpayers, politicians, and educators in turn have given support to what has become known as the “assessment movement.” This movement is dedicated to understanding through assessment the impact that college has on students, and to holding colleges and universities accountable for their educational outcomes. Legislatures in fifteen states have mandated that their state institutions measure  

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1 The most influential reports on the state of higher education in the last five years have been the National Institute of Education’s Study Group on the Conditions of Excellence in Higher Education (1984); the Association of American Colleges’ Project on Redefining the Meaning and Purpose of Baccalaureate Education (1985); the report by the Carnegie Foundation for the Advancement of Teaching on the undergraduate experience in America (Boyer, 1987); the “Governors’ 1991 Report on Education” (National Governors’ Association, 1987); and the recent best-selling books, The Closing of the American Mind by Allan Bloom (1987) noted above, and Cultural Literacy by E. D. Hirsch (1987).
the learning outcomes of their students. Furthermore, the United States Department of
Education has used its influence to ensure that regional accrediting boards look at stu-
dent outcomes in the accreditation process, thus putting pressure on private as well as
public institutions to undertake assessment activities. According to Campus Trends,
1989 (El-Khawas) nearly seven in ten institutions of higher education now have some
form of assessment activity in place.

Though the current calls for reform have expanded college assessment programs and
focused public attention on the outcomes of college, research on college impact goes
back more than half a century. We turn next to a few of the highlights from this research
which identify specific areas of concern.

Research on College Impact

In general, the aim of college impact studies has been to answer the question of the
effects of college on its students. In recent decades, however, the question has changed
from, "What are the benefits that come with a college education?" to "Under what con-
ditions do what kinds of students change in what ways?" This latter emphasis persists
today.

One of the earliest compilations of the research, by Feldman and Newcomb (1973),
summarizes 1500 studies (until approximately 1970) in two volumes. In it the authors
conclude that the most salient changes among students were increases in

openmindedness (reflected by declining authoritarianism, dogmatism, and prejudice), de-
creases in conservatism in regard to public issues, and growing sensitivity to aesthetic and
"inner" experiences. In addition, a majority of studies show[ed] a declining commitment to
religion, increases in intellectual interests and capacities, and increases in independence,
dominance, and confidence as well as readiness to express impulses. (p. 48)

As one can see from the list of outcomes, the majority of studies up to that time had
addressed the stability of students' attitudes and values. Intellectual aptitudes, though
admittedly subject to change, are discussed only briefly in a footnote (p. 29) in which
the reader is referred to several articles. Studies of development among young adults
were just appearing.

Since that time, research has increased, focusing on three main areas: values and atti-
tudes, achievement, and human development. We see in these areas even more clearly
the issue of substance in a college education.

Values and attitudes. The changes in values and attitudes reflected in the Feldman
and Newcomb overview have been substantially corroborated by several large-scale
studies by Alexander Astin (1975, 1977, 1985) of changes in student beliefs and atti-
tudes. College attendance in general, he found, tended to strengthen students' compe-
tence, self-esteem, artistic interests, liberalism, hedonism, and religious apostasy, and to
weaken their business interests.

Astin also discovered that these changes in attitudes and beliefs were largely peer-
mediated, based on an indication that greater-than-average involvement in both athletic
and academic activities (e.g., being a member of a college team or being in an honor so-
ciety) was negatively correlated with these overall effects of college and, conversely,
that involvement in student government tended to accentuate these effects. The author
suggests that these two findings together “support the hypothesis that the changes in attitudes and behavior that usually accompany college attendance are attributable to peer group effects” (1985, p. 150).

Astin’s conclusion that the peer group is the main influence in college is in part attributable to his self-report survey method, which is not likely to detect more subtle changes in emotional or cognitive development. Even so, this finding is disconcerting, and it brings into question the extent of the influence of faculty and instruction on student outcomes. A second concern emerges from the nature of the changes taking place—for example, increasing hedonism and religious apostasy. Inasmuch as these do not reflect the goals of any college catalog, they appear to be unintended and (most would say) unfortunate outcomes of college. They imply, rather, increasing skepticism and a retreat from the deeper values of culture which help give meaning and importance to daily life. These two concerns illustrate the effects of the problem of substance in the lives of students.

**Achievement.** A study by Robert Pace (1979) provides an in-depth summary of 50 years’ research with achievement tests and alumni surveys. His review supports—and greatly expands—Feldman and Newcomb’s passing reference to the benefits of college for scholastic aptitude. In general, with respect to achievement, Pace’s summary shows that colleges have been very successful in imparting information. The more that students study a subject, the more they know it, and the more closely related a subject is to their major field, the more they know about it. “Seniors know more than sophomores and juniors know more than freshman” (pp. 166–167).

Pace, by his own admission, was chiefly interested in achievement results, yet he reflects on the unfortunate division in the research between knowledge acquisition and personal development. Researchers who study knowledge acquisition and intellectual skills tend not to study personal development, and vice versa. Anticipating the Vedic Science based assessment approach we will discuss below, Pace calls for further study of the interaction of these two aspects of the college experience.

In recent studies, researchers have begun to probe into the factors behind knowledge acquisition and achievement. Winter, McClelland, and Stewart (1982), for example, undertook a large-scale study of liberal arts education. At one Ivy League college, they found improvements both in students’ ability to form and articulate complex concepts and in their ability to deal flexibly and consistently with rational argument. These findings were contrasted with those from a state teachers college and a two-year community college, which showed little or no change in these same measures. Similarly, at a liberal arts women’s college, Mentkowski and Strait (1983) found longitudinal and cross-sectional differences between freshman and seniors on a measure of critical thinking. Such studies give us hope that at least some institutions are going beyond knowledge acquisition, but simultaneously raise questions about the great majority of state and professional institutions to which these few institutions are compared. Further, one must ask how much beyond information acquisition are even the best institutions moving? To answer this question we turn to research on human development.

**Human development.** The third area of research on college outcomes is human development; that is, the changes that college brings about in stages of cognitive, moral,
and ego development. In the forefront of theory and research in this area is Arthur Chickering. In *The Modern American College* (1981), the 800-page volume he edited, he solidifies the focus of his earlier work (Chickering, 1969), suggesting that “explicit concern for adult development can provide the ‘unifying purpose or idea’ for higher education. . . .” He presents entire chapters on ego development, cognitive growth, growth of intelligence, moral development, and nine other specific areas of human development.

In his work Chickering has provided an extremely valuable service to this area of research by focusing the issues and variables surrounding human development. On the other hand, his work also points up the lack of definitive findings in many important areas. In *The Modern American College*, for example, the chapters on ego development, intelligence, and moral development present little evidence that college has a salutary effect on these aspects of personality. The authors cite one longitudinal study in progress using the Loevinger scale of ego development, no reported longitudinal studies of the development of intelligence in college, and one reported study of Lawrence Kohlberg’s attempt to foster moral development among college students through a course on moral and political choice.

Other research on development during college, including more recent studies, has yielded mixed results. Studies of private, in some cases highly selective, institutions show modest freshman-to-senior differences in cognitive development and intellectual-ethical development (Mentkowski & Strait, 1983; Whitla, 1978). Studies of ego development have found modest gains in some cases (Mentkowski & Strait, 1983; Redmore, 1983; Loevinger et al., 1985) and no change over comparable periods of time in other cases (Adams & Fitch, 1982; Kitchener, King, Davison, Parker, & Wood, 1984.) Even in the instances where change in ego or moral development has occurred, the absolute differences between freshmen and seniors are not impressive within the stage theory itself. In terms of moral reasoning, though the Whitla study shows difference between the groups of freshmen and seniors, both groups functioned at a mean of stage four, where stage six represents the culmination of development. Stage four bases moral decisions on a continuation of authority and social order as compared with stages five and six, which develop the foundations of democratic citizenship and ultimately principled moral judgment. In terms of ego development, though the Mentkowski study shows a cross-sectional (though not longitudinal) difference between freshman and seniors, even the seniors were only functioning at stage four (out of six), labelled “conscientious.” This level represents a stage beyond conformism but still prior to the full integration of the individual’s conflicting inner needs. In neither case can one feel that college as an institution is meeting its responsibility in light of the end goal of human development.

All told, unlike the research with achievement tests, studies of human development remain disquieting. The change observed at even the best schools shows only modest gains, and several studies show little or no gains along this dimension of college impact.

It is clear from this brief review of the literature on college impact that college students do progress on measures of their knowledge and intellectual skills. In addition, their attitudes change, but not necessarily in response to instruction and not necessarily in a desirable direction. On the broader, deeper measures of human development, such as moral or ego development, there is little to inspire us. Some institutions do seem to
have a modest though statistically significant impact on measures of human development (Whitla, 1978; Mentkowski & Strait, 1983), but these remain the exception among the 2,100 baccalaureate institutions in the United States, and on any absolute scale the change at even these institutions is not impressive.

This review, though by no means conclusive, serves to strengthen and focus the view that the vast majority of baccalaureate institutions are not significantly affecting the deeper levels of human experience and behavior. In response to students’ questions about their identity, about right action, or about their purpose in life, colleges have typically supplied more information, more questions, rather than deeper knowledge or ability. As a result the scope of students’ doubts has expanded rather than narrowed. As one report phrased it, “We have reached a point at which we are more confident about the length of a college education than its content and purpose” (Association of American Colleges, 1985, p. 2). This situation may be, as Boyer suggests (1987, p. 2), because expectations are too low, or it may be due to a lack of means to touch the deeper levels of the student’s life. Ultimately, the two causes must go hand in hand: if one does not expect to affect the deeper levels of students’ lives, they are unlikely to be changed; on the other hand, if attempts to address these deeper levels do not produce measurable results, then they are likely to be dismissed as unimportant objectives of the institution. For example, while institutions in higher education would like to develop the general intelligence of their students, most research indicates that fluid intelligence does not significantly increase after late adolescence. As a result, most universities do not attempt to develop intelligence. In either case, the research on college impact only clarifies the need for a system of education that is capable of successfully addressing the full range of human development — body, mind, and self — and such a system in turn requires a broader science of life than has been available in higher education in the recent past.

II. Maharishi’s Vedic Science Based Education in Higher Education

Previous writing on Maharishi’s Vedic Science Based System of Education has focused on general theory and outcomes (Levine, 1972; M.C. Dillbeck, Aron, & S.L. Dillbeck, 1979; American Association for Ideal Education, 1985; S.L. Dillbeck & M.C. Dillbeck, 1987); on individual empirical studies (cf., Orme-Johnson & Farrow, 1977; Chalmers, Clements, Schenklunh, & Weinless, in press; Wallace, Orme-Johnson, & M.C. Dillbeck, in press), or on reviews of research at the elementary and secondary levels (Nidich & Nidich, 1987; Nidich & Nidich, 1989). This paper complements these approaches by reviewing theory and research on Maharishi’s Vedic Science Based Education at the post-secondary level.

Maharishi International University was founded in 1971 by Maharishi Mahesh Yogi, in direct response to the challenge of substance that colleges faced then as well as now. As early as 1959, in a lecture to educators, Maharishi described the modern-day university as “hovering on the surface of knowledge.” As a result, he said, “every subject is suffering and every student of every subject is suffering” (Maharishi Vedic University, 1986, p. 269). There are two sides to knowledge, he explained, the object of knowledge — the known — and the subject, who is the knower. While education at all levels was
providing knowledge of the object, it was missing the knowledge of the subject or the knower, in whose awareness the knowledge is structured. As a result, while students were learning the theories of the sciences or the humanities, the source in consciousness from which the theory was born remained hidden. Thus, even the objective knowledge was missing its foundation. From Maharishi’s perspective, colleges have not realized their potential primarily because they have not been able to develop the knower as systematically as they have developed the known.

In the same address in 1959, Maharishi offered his solution to this lack in education—a technique whereby students could experience the silent, unmanifest source of thought deep within the mind. Maharishi describes this source of thought as the experience in individual life of the absolute basis of all relative existence.

... it is necessary for the student of every subject to connect [a] field of study with the field of the Absolute within. ... If, along with the study of each subject, the experience of the Absolute is taught to the students, then they will be able to fathom the deeper levels of that subject and the whole range of that subject will be studied properly. When the two extremities of that subject—the gross, expanded value and the transcendental value—are connected, then the field of that subject will be complete, and the study of that subject will bring something real and useful in life. (Maharishi Vedic University, 1986, p. 269)

Maharishi International University (MIU) was founded to achieve this integration between the gross, surface values of the various disciplines and the transcendental value in the consciousness of the learner. It brings together the two major streams of knowledge in the world—modern science and Maharishi’s Vedic Science—on the ground of Vedic Science, which itself is a complete science of both objectivity and subjectivity.

At the heart of Maharishi’s Vedic Science is the technology of the Transcendental Meditation (TM) and TM-Sidhi program. This technology systematically cultures the mind’s ability to appreciate surface values along with the transcendent. It develops an intellect that, like a great tree, is diversified in numberless small branches and yet securely unified at its roots—simultaneously infinitely diverse and completely unified (Maharishi Mahesh Yogi, in press).

The Fundamentals of Vedic Science Based Education

The single unifying theme of Maharishi’s Vedic Science Based System of Education is that education, to be ideal, must provide the knowledge and experience of the self-interacting dynamics of consciousness, the self-sufficient source of all creativity in nature and human experience. The student must come to understand the more surface values of the subject matter—its facts and figures—but not see these as the primary reality. The facts and figures must be understood in terms of deeper levels of thought and ultimately as expressions of the wellspring of human consciousness, the absolute level of consciousness at the source of thought. This absolute value of consciousness, by interacting with itself, gives rise to all the disciplines and to all their practical applications.

A complete explanation of the self-interacting dynamics of consciousness is available in Maharishi’s Vedic Science (Maharishi Mahesh Yogi, 1986; M.C. Dillbeck, 1988), but a useful introduction to their range and significance can be found in modern physics. One of the dreams of Albert Einstein in the early days of quantum field theory
was to forge a physical theory that would unify the four fundamental forces of nature: electromagnetism, gravity, and the strong and weak nuclear forces. Einstein did not live to see this happen, but over the last three decades quantum field theory has made tremendous strides toward the realization of Einstein’s dream (see, e.g., Georgi, 1981). In 1978, for example, Weinberg and Salam were able to show how electromagnetism and the weak force were actually diverse expressions of a more fundamental electro-weak force. For this they received the Nobel Prize in the following year. In the last two years, Hagelin (1988) has proposed a grand unified theory linking all the forces except gravity to a grand unified force.

There is little doubt at this time that in principle gravity, too, is susceptible to this same process of unification. Thus physics today has glimpsed the goal that Einstein had set more than half a century ago of a completely unified field giving rise to all the force and matter fields — a unified field theory, or, as popular journals have called it, the t.o.e., the “theory of everything” (Taubes, 1986).

These current events in science would be of merely academic interest except that several of the qualities of the unified field emerging from physical theory remind us more of life in its animate expressions than of the great lifeless machine that Newtonian mechanics first depicted. According to quantum field theory, the unified field is self-interacting in that it must interact with itself in order to give rise sequentially to the known forces and particles (Hagelin, 1987). Mathematically it appears to contain an infinite amount of free energy; hence it is infinitely dynamic. And finally, it is self-sufficient, in that it gives rise to natural laws from within itself, without the need of an external agency. Thus, it appears from physics that nature is more self-aware, more dynamic, and more self-contained than previously thought.

According to Maharishi’s Vedic Science, these qualities of the unified field are salient qualities of consciousness. Maharishi’s Vedic Science explains this resemblance in its description of the origins of human consciousness. The qualities of the unified field at the basis of physical theory appear similar to the qualities of human consciousness because, according to Vedic Science, consciousness is the primary constituent of mind, body, and environment. Maharishi has explained that consciousness in its pure state gives rise, on the one hand, to the flow of consciousness as thought and to human action, and, on the other hand, to the force and matter fields of the objective world. In other words, consciousness, by virtue of its self-awareness and through its own self-interacting dynamics, gives rise to all the diverse levels of the mind and matter. It is this field of pure consciousness that can be directly experienced during Maharishi’s Transcendental Meditation technique.

Maharishi explains the practical value of this understanding of man’s intimate connection to his environment:

The unified field is the unmanifest basis of the whole creation, the creator and governor of the whole universe. Through Transcendental Meditation it is simple to open our awareness to this state of transcendence. Spontaneously, the conscious mind identifies itself with the self-referral unified field, the fountainhead of all the streams of activity in nature. As we gain more and more familiarity with that self-referral performance, our thoughts and actions spontaneously begin to be as orderly and evolutionary as all the activity of nature. (Maharishi Mahesh Yogi, 1986, p. 97)
In this unified field of consciousness the three aspects of the educational process — the knower, the known, and the process of knowing — are unified into one self-referral state where knowledge is its own knower, where the innumerable impulses of natural law which structure objective and subjective creation are found together. This togetherness of knower, known, and process of knowing in the unified field of pure consciousness is called in Vedic Science the Samhita — literally, the “togetherness” — of all the impulses of consciousness.

The fundamentals of Maharishi’s Vedic Science based education can be derived from this single principle of the emergence of both nature and experience from the self-interacting dynamics of the Samhita value of consciousness. Because all knowledge arises from the Samhita value of consciousness, any part of knowledge that is understood separately from its source in consciousness ultimately becomes dry, potentially misleading, and of relatively little use to the knower — the unfortunate result when the various branches of modern science are taught without reference to their source. Conversely, knowledge of the Samhita value of knowledge connects and coordinates all other aspects of knowledge. As the sap brings nourishment and vitality to every fiber of the tree, experience and understanding of the Samhita brings to the parts of knowledge vitality, purposefulness, and practicality.

In addition, by knowing this level of reality one gains access to the source of all the laws of nature, which Maharishi calls “the switchboard of natural law,” bringing mastery over the course of action. This, according to Maharishi’s Vedic Science, is the fruit of all knowledge, the ability to act spontaneously in accord with all the laws of nature, “the ability to know anything, do anything and achieve anything” (Maharishi Mahesh Yogi, in press).

Maharishi offers the experience and understanding of the Samhita as a practical solution to the challenge of substance with which we began; he explains that to identify one’s conscious mind with the transcendental organizing center of human experience is to gain the highest knowledge available about nature and consciousness. Through this experience one develops the ability to act in accord with the orderly and evolutionary force of natural law, to fulfill one’s desires in a way that is naturally and spontaneously fulfilling for oneself and society.

The two ways in which this unification of knower, knowing, and knowledge is gained in Maharishi’s Vedic Science based education are through (1) the regular experience of this Samhita value of consciousness using the technologies of Vedic Science — especially Maharishi’s Transcendental Meditation and TM-Sidhi program, and (2) the connection of all that is learned in the classroom to this Samhita value, the unified basis of knowledge. In 1971, Maharishi founded a new discipline, the Science of Creative Intelligence (SCI), which links the modern academic disciplines with his Vedic Science, connecting the knowledge in each discipline with its source in the unified field, known in SCI as the field of pure creative intelligence. In practical terms, the students and faculty begin each day with the practice of the Transcendental Meditation and TM-Sidhi program, which gives them the direct experience of the self-referral state of their own consciousness. Then in the classroom, by connecting through SCI all new knowledge to this familiar source of knowledge, all parts of knowledge are understood in relation to
the wholeness of knowledge and experience in the student’s own Self.

The effects on individual and collective life of these two aspects of Vedic Science based education stand in contrast to the effects of a college education following the traditional model. Instead of feeling increasingly lost in an ever-expanding horizon of knowledge, students begin to feel increasingly at home with knowledge, at home with themselves. Instead of identifying their minds and whole being with the isolated parts of the traditional disciplines, they begin to identify more and more fully with the Samhita of knowledge and knowing which is their own Self. Instead of their consciousness becoming increasingly dominated by the pressure to achieve, combined with the constant wear this pressure brings to the physiology, they become increasingly at ease with a rapid pace of development. They begin to enjoy and focus on their own progress.

The fundamental features, then, of Maharishi’s Vedic Science based education are the two mentioned above — the experience and the understanding of the Samhita value of consciousness — plus the most advanced knowledge of the traditional disciplines, and specific techniques of teaching which connect the surface values of knowledge with the source of knowledge (see Figure 1 below).

The Fundamental Features of Maharishi’s Vedic Science Based Education

<table>
<thead>
<tr>
<th>Traditional knowledge</th>
<th>PROVIDES</th>
<th>Current knowledge of the sciences, arts and humanities.</th>
</tr>
</thead>
<tbody>
<tr>
<td>The technology of Maharishi’s Vedic Science</td>
<td>PROVIDES</td>
<td>Direct experience of the Samhita value of consciousness, the basis of all streams of knowledge, through Maharishi’s TM and TM-Sidhi program.</td>
</tr>
<tr>
<td>Intellectual knowledge of Maharishi’s Vedic Science</td>
<td>PROVIDES</td>
<td>Understanding of the theoretical principles which govern the self-interacting dynamics of consciousness in the unified field and their expression into all of the levels of objective and subjective life.</td>
</tr>
<tr>
<td>Vedic Science based teaching techniques and curriculum design</td>
<td>PROVIDES</td>
<td>An approach to teaching and curriculum design through which every lesson is taught with reference to the whole of knowledge in the discipline, and the source of all disciplines is shown to be the students’ own Self.</td>
</tr>
</tbody>
</table>

Figure 1. This chart identifies the four distinguishing features of Maharishi’s Vedic Science based education and the role they play in the educational process.
This alternation of direct experience of the self-referral state of consciousness through the TM and TM-Sidhi program, with the intellectual probing into the relationship of that self-referral state to all of knowledge, is designed to lead to more refined states of consciousness, supported by more balanced, integrated styles of physiological functioning. Maharishi has laid out the intended outcomes of this system of education in his descriptions of higher states of consciousness (Maharishi Mahesh Yogi, 1969). Above all, Maharishi states, higher education should be for higher consciousness.

In the next section we will describe in more detail the main features of Maharishi International University, the first institution to implement Maharishi’s Vedic Science based educational system from pre-school to the Ph.D. level. Here many of the abstract fundamentals of the approach discussed above are embodied.

Maharishi International University: The Model of Vedic Science Based Education

At Maharishi International University every aspect of the curriculum is designed to help the student experience the underlying self-interacting dynamics of consciousness and to connect these dynamics to all that is learned.

The main features of the curriculum at MIU are listed below according to the fundamental of Vedic Science based education that they reflect:

A. Applications of the technologies of Maharishi’s Vedic Science.

1. Research in Consciousness course. All students enroll for a course in “Research in Consciousness,” the main feature of which is the personal practice of the TM and TM-Sidhi program. This course, taken concurrently with their traditional coursework, supplies the means for experiencing the principles of Vedic Science that are brought out in classes.

2. Collective practice of Maharishi’s Transcendental Meditation and TM-Sidhi Program. An important feature of the Research in Consciousness course is collective practice of the technologies of Maharishi’s Vedic Science. Approximately 1600 students, faculty, staff, and members of the surrounding community come together twice daily in one place to practice the Transcendental Meditation and TM-Sidhi program.

B. The knowledge of Maharishi’s Vedic Science.

1. Maharishi’s Science of Creative Intelligence integrated throughout the curriculum. SCI describes in the simple language of everyday experience the nature and functioning of consciousness, both in its pure unmanifest form as the unified field and as the manifested, concrete universe. SCI in turn provides the intellectual framework used in all subsequent courses to connect each of the disciplines to the student’s experience of pure consciousness, the unified source of knowledge.

2. Regular courses in Maharishi’s Science of Creative Intelligence and Vedic Science. All students begin their undergraduate study with a course in Maharishi’s Science of Creative Intelligence (SCI), taught on videotape by Maharishi. This course introduces students to the interdisciplinary principles which describe the functioning of intelligence in nature as a whole and in human life. These principles are common to both the subjective approach of Vedic Science and the
objective approach of modern science. Maharishi’s Vedic Science is the science of consciousness in its pure form, describing the self-interacting dynamics of consciousness underlying phenomenal creation and the process by which those dynamics give rise to experience and to natural law. All students also spend a two-week period twice each year studying advanced topics in both Vedic Science and the Science of Creative Intelligence.

3. Interdisciplinary First-Year Program. In the first year at MIU, all undergraduate students take a sequence of core courses, collectively entitled “A Vision of All Disciplines in the Light of Maharishi’s Science of Creative Intelligence,” which connects the fundamental concepts of 14 or more major academic fields to the students’ experience and understanding of their own intelligence. This sequence of coursework is designed to make students feel at home with all knowledge and to enable them to see the various disciplines as expressions of their own intelligence.

C. Vedic Science based teaching techniques and curriculum design.

1. Main Point Charts and Unified Field Charts. In teaching the traditional disciplines, all faculty use visual aids that identify the main points of each lesson and connect these main points to the student’s experience and to the evolutionary dynamics of consciousness elucidated by the Science of Creative Intelligence. In addition, each university department has developed a “unified field chart” which depicts the relationships among (1) the areas of study within a discipline, (2) the unified foundation of the discipline, and (3) the experience of the unified field of natural law during Maharishi’s TM and TM-Sidhi program. This chart ensures that, in learning the subject matter of a course or a discipline, the student does not become lost in a particular topic. With the unified field chart each lesson can be placed in the context of the evolution of consciousness in its subjective and objective expressions.

2. Teaching techniques that refine the mind. All faculty are educated in the use of teaching techniques that create a stress-free learning environment and help to refine the functioning of all levels of the mind. Professors learn to unfold the knowledge of a lesson, for example, in the same way the Samhita itself unfolds, beginning from the wholeness of the main idea and elaborating that wholeness into its constituent parts, while still maintaining the wholeness at every step of elaboration. Thus knowledge is imparted in a way that supports the students’ growth of intelligence toward enlightenment, where the intellect is simultaneously infinitely diverse and completely unified.

In addition to these unique aspects of the MIU educational program, there are other features which, although not defining characteristics of Vedic Science based education, have been developed by the faculty in the context of Vedic Science and contribute to the overall educational impact. For example, all courses at MIU are taught intensively, one at a time. Instead of taking several courses simultaneously over several months, MIU students take each course separately over a period of one to four weeks. This format allows the student to probe deeply into one field without competing demands from other coursework. Two other practices that are likely to contribute an effect include:
(1) a longer academic year (44 weeks) which permits a longer period of exposure to the college experience, and (2) a “tutorial system” — that is, a mentoring system in which every student is assigned to individual faculty for advice and support through an informal relationship.

In the next section we examine the latest research on Maharishi International University. This research documents how the latent potential of students is fostered by Vedic Science based education at MIU. By developing students’ abilities and by providing the integrated knowledge of the knower, the known, and the process of knowing, MIU enables students to resolve the “transcendent issues,” referred to by Boyer, on the ground of pure consciousness, the fountainhead of all the streams of knowledge.

III. Research on Vedic Science Based Education at the Post-Secondary Level

Research on the outcomes of Vedic Science based education can be divided into two areas: (1) research on the Transcendental Meditation and TM-Sidhi program, the core educational technology derived from Maharishi’s Vedic Science, and (2) research on Maharishi International University, a model of Vedic Science based higher education.

Research on Maharishi’s Transcendental Meditation and TM-Sidhi program

At the core of Maharishi’s Vedic Science based education is the Transcendental Meditation and TM-Sidhi program. The TM technique itself is a simple, effortless technique which allows the conscious mind gradually to settle down while remaining completely alert, until thinking is transcended entirely and the mind experiences its own silent, unbounded nature. Maharishi’s TM-Sidhi program is an advanced technology of Vedic Science which can be learned on the basis of several months’ experience with Maharishi’s Transcendental Meditation technique. It accelerates the unfolding of the student’s mental and physiological potential in the same way as the TM technique and develops in addition a highly refined level of mind-body coordination.

Research on the Transcendental Meditation and TM-Sidhi program dates back to 1969 when physiological benefits of the TM technique were first measured. Since this time over 430 studies have been undertaken at 160 independent research institutions and universities in 27 countries. A number of these have direct implications for education. The extent of the research on the TM technique relevant to education makes it one of the most widely researched educational technologies available today.

S.L. Dillbeck and M.C. Dillbeck (1987) summarized 36 studies on the TM and TM-Sidhi program relevant to education. Research has shown improvements in a number of the factors known to contribute to learning, including increases in alertness, intelligence, memory, field independence, self-concept, and emotional stability, as well as greater physiological resistance to stress.

One subset of the research on the Transcendental Meditation and TM-Sidhi program particularly relevant to higher education is composed of studies on the “Students’ TM-Sidhi Course.” Those students who have not learned Maharishi’s TM-Sidhi program before attending MIU may learn it in their first two years of study at the university. In
fact, it is perhaps the single factor in the curriculum that students most strongly asso-
ciate with personal growth.

Several longitudinal studies (M.C. Dillbeck, Landrith, & Orme-Johnson, 1981; Orme-Johnson, 1982; and Wallace, Mills, Orme-Johnson, M.C. Dillbeck, & Jacobe, 1983) have found increases in creativity, functional integration of the brain, and flexibility of the central nervous system among students who took the Students’ TM-Sidhi course, as compared with other MIU students serving as controls who continued with their prac-
tice of the TM technique by itself over the same three-month period. These findings il-
lustrate some of the psychological and physiological changes that develop in students
through regular practice of Maharishi’s TM-Sidhi program at MIU.

Research on Maharishi International University

The body of research on the TM and TM-Sidhi program represents the kinds of
changes that one may expect to occur as a result of adding this technology to a college
curriculum. With the establishment of MIU, however, it became possible to study the
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consciousness.

This section presents the research on MIU’s system of education according to the
standard categories of educational measurement (Sax, 1980): achievement and aptitude,
intelligence, and values and attitudes. From the design of MIU’s educational system one
would predict that students would show improvements along the standard dimensions of
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ticipated in research on other institutions.

Achievement and aptitude. Measures of educational achievement and scholastic ap-
titude are quite similar. By tradition, achievement tests place more emphasis on the spe-
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The Office of Evaluation at MIU has experimented with a number of general education
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(writing, reading, critical thinking, and using mathematical data). Results from this test allow MIU to compare the performance of its seniors with those at 31 other liberal arts institutions in 1988 and 23 other schools that administered the short form in 1989.

Of the seniors who took the test at MIU, only 45% in 1988 and 60% in 1989 listed English as their native tongue, while the national average of students in four-year private colleges who are U.S. citizens is 97.9% (from the CIRP data, Astin, Kenneth, Korn, Schalit, & Berz, 1988). In previewing the test, it was suspected that familiarity with English would affect performance, due to the amount of reading required, and later statistical analysis confirmed that native language was moderately ($r_{pb} = .28$) though significantly ($p = .03$) correlated with composite score. Consequently, the average scores were calculated for the English language group only, as this group most closely resembled the comparison group provided by ETS. Table 1 summarizes the performance of two groups of MIU seniors on the Academic Profile, showing the percent correct and the percentile rank of the English language groups on each of the seven subscales and the composite scores of the test. These ranks were computed from the aggregated data provided by ETS through a process of linear interpolation and therefore represent best estimates of MIU’s standing among the other colleges in its Carnegie classification who administered the exam.

This table shows that the relative performance of the two groups on each of the seven scales varies substantially between 1988 and 1989. The 1988 group performed most strongly in critical thinking and the natural science subject field, while the 1989 group

<table>
<thead>
<tr>
<th>TABLE 1</th>
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<tbody>
<tr>
<td>MEAN PERCENT CORRECT AND PERCENTILE RANK OF THE NATIVE LANGUAGE GROUP OF MIU STUDENTS ON THE ACADEMIC PROFILE TEST</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pilot I 1988 scores</th>
<th>HUM</th>
<th>SOC</th>
<th>NAT</th>
<th>RDG</th>
<th>WTG</th>
<th>THK</th>
<th>DTA</th>
<th>TOT</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=23 students</td>
<td>67</td>
<td>65</td>
<td>69</td>
<td>68</td>
<td>69</td>
<td>63</td>
<td>67</td>
<td>67</td>
</tr>
<tr>
<td>Est. percentile*</td>
<td>N=31 schools</td>
<td>80</td>
<td>87</td>
<td>95</td>
<td>77</td>
<td>77</td>
<td>97</td>
<td>94</td>
</tr>
<tr>
<td>Pilot II 1989 scores</td>
<td>HUM</td>
<td>SOC</td>
<td>NAT</td>
<td>RDG</td>
<td>WTG</td>
<td>THK</td>
<td>DTA</td>
<td>TOT</td>
</tr>
<tr>
<td>N=33 students</td>
<td>71</td>
<td>69</td>
<td>66</td>
<td>77</td>
<td>71</td>
<td>59</td>
<td>68</td>
<td>68</td>
</tr>
<tr>
<td>Est. percentile*</td>
<td>N=23 schools</td>
<td>96</td>
<td>88</td>
<td>81</td>
<td>84</td>
<td>96</td>
<td>92</td>
<td>89</td>
</tr>
</tbody>
</table>

* Percentiles represent rank of MIU among the group of institutions which administered the Academic Profile that year. They are estimates based on the grouped data provided by ETS.

**Key:**
- HUM = Humanities
- SOC = Social Sciences
- NAT = Natural Sciences
- RDG = College Level Reading
- WTG = College Level Writing
- THK = Critical Thinking
- DTA = Using Mathematical Data
- TOT = Composite Score
performed best in the humanities and writing. Review of the majors represented among the two groups reveals that the differences in performance reflect the relative proportions of humanities and science majors in the two groups. The significant discovery, however, is that the total or composite score each year — the most reliable score statistically — is relatively consistent over the two administrations of the test. Further, the composite score of each group (the Total Score) places the English language group at MIU among the top three or four institutions which gave the test each year.

The gain in achievement of the MIU group, relative to other colleges, is not entirely determinable from these numbers, inasmuch there has been no attempt to control for entry characteristics of students. Nevertheless, within the limits imposed by the availability of data, the level of achievement of the MIU seniors is highly respectable for a university that has a liberal acceptance policy with regard to academic preparation.

One other study in a related area looked at field independence, a psychological trait known to influence academic performance. Previous research has correlated field independence with developmental measures such as Piaget’s formal operations stage (Rubenstein, 1980), Piaget’s and Kohlberg’s moral reasoning stages (Arbuthnot, 1971), fluid intelligence, and various measures of both verbal and performance intelligence (McKenna, 1984). One measure of field independence is the embedded figures test (Witkin, Oltman, Raskin, & Karp, 1971). The embedded figures test is not a pure measure of field independence (Arbuthnot, 1972), but detects the ability to de-embed a geometric figure from a complex surrounding and hence to maintain a stable internal reference frame amidst background distractions. It likely involves elements of perception and working memory as well as cognitive style, and performance on the test does not typically improve significantly after ages 15 to 17 (Witkin, Goodenough, & Karp, 1967).

In a longitudinal study by M.C. Dillbeck, Assimakis, Raimondi, Orme-Johnson, & Rowe, (1986), field independence as measured by the group-administered embedded figures test increased among MIU students over four years. Fifty undergraduates in the class of 1984 were measured at the beginning and end of their college career. At entry, students were significantly above the mean for the norm reference group (with an average score of 13.5 out of 18), and over four years they increased to a group average of 15.2 ($F = 10.40, p = .005$).

To summarize this area of research, students at Maharishi International University appear to be developing a stable cognitive style — a more efficient style of learning — at the same time that they are acquiring a high level of proficiency with the knowledge and skills of a general education. This finding supports a major objective of Maharishi International University and Vedic Science based education, which is to develop the intellectual resources of students at the same time that they are acquiring the knowledge and skills requisite for an educated person.

Intelligence. The study of intelligence through psychological tests is a complex process. No test may be said to directly measure intelligence; rather performance on any one test can be partially explained by a general factor that correlates highly with all mental tests and a number of specific factors relevant only to the one test. The general factor has been called “g” for “general intelligence,” also called fluid intelligence. The specific factors have been called the “s” factors (Sax, 1980). An example of the generality
of the “g” factor can be seen in a study sponsored by the Washington State Board of Higher Education. This study found that the Academic Profile, together with a similar general education test prepared by the College Board, involved one factor, called by the researchers verbal and quantitative ability, which accounted for 60% of the variance on those tests (Council of Presidents and State Board for Community College Education, 1989). This finding accentuates the importance of general or fluid intelligence in college achievement. Of five studies on MIU students that measured intellectual ability, four have focused on general or fluid intelligence, per se. We include, in addition, a study on moral reasoning which, though not traditionally viewed as a measure of intelligence, we associate with abstract reasoning in the broad practical sense.

With respect to fluid intelligence, M.C. Dillbeck et al. (1986), Cranson, Alexander, Orme-Johnson, Jones, & Gackenbach (1989), and the author have replicated an initial pilot study by Aron, Orme-Johnson, & Brubaker (1981) on the effects of Vedic Science based education on intelligence. The common measure in these studies was the Cattell Culture Fair Intelligence Test. On this test the examinee chooses from among several options a simple geometric shape or design that either completes a progression of such shapes, completes a pattern, does not belong to a set of similar shapes, or shares a common feature with other shapes. As a group-administered, non-verbal measure of general intelligence, it is particularly suited to evaluation research with populations that have a high proportion of non-native speakers, as MIU has. Previous research (Barton, 1973) has indicated that performance on this test, as with most intelligence tests (Sax, 1980), does not increase significantly after ages 15 to 17; indeed, the study by Cranson et al. included a control group of college students from another university that did not improve significantly between the time of their enrollment in college and the middle of their junior year.

With MIU students, Aron and M.C. Dillbeck found increases equivalent to nine standard IQ points in four years (Dillbeck, \( F(1,28) = 16.88, p < .001 \)). Cranson et al. found in two-and-a-half years a growth of five points (\( t = 2.79, p < .005 \)). Most recently, in an unpublished study, the author found an increase of seven points over the first nine months of the first year (\( F(1,43) = 11.09, p < .002 \)).

To test the generalizability of the results, Cranson et al. employed another measure of intelligence in addition to the Cattell test, the Hick’s measure of choice reaction time. Choice reaction time was chosen particularly because it has been shown to be strongly associated with the “g” factor (Jensen, 1978). With three parameters on this test (two separate tasks and the standard deviation of reaction time for each individual), Cranson found significant improvements among the experimental group and not the controls over the first two-and-a-half years of undergraduate study (the multivariate \( F \) including the Cattell test = 31.20 (4,53), \( p < .000005 \)).

Taken as a whole these studies of intelligence present a remarkably strong case in support of the thesis that Vedic Science based education improves one of the fundamental abilities underlying academic performance. We are not aware of any other research indicating improvement in general intelligence resulting from traditional higher education, and therefore this research in itself offers new possibilities for improving students’ fundamental abilities, one aspect of the substance issue facing post-secondary educational institutions.
One other finding from a different area of research — moral studies — reflects the influence of MIU’s educational system on abstract reasoning ability. Nidich has conducted several studies of moral reasoning as defined by Lawrence Kohlberg (Nidich, 1975; Nidich & Orme-Johnson, 1982; Nidich & Nidich, in press). In the initial studies with college students at a public university he found longitudinal improvement in the level of moral reasoning as a result of starting the practice of Maharishi’s TM technique. In later cross-sectional studies (Nidich & Orme-Johnson, 1982) with MIU students, using the Rest Defining Issues Test, Nidich found levels of principled moral reasoning which were higher than control subjects from another small private college with similar admissions policies. Nidich also compared controls with a group who planned to start the TM technique (pre-TM group) and with a group that was practicing the TM-Sidhi program. There were no significant differences between the pre-TM and the controls. The TM-Sidhi group scored significantly above those who had only learned Maharishi’s TM technique. Both SAT scores and average GPA, known from previous research to affect levels of principled moral reasoning on this measure, were not different among the four groups. In other research Nidich (1975) found that students at MIU, compared to controls, displayed significantly higher levels of moral reasoning on Kohlberg’s Moral Atmosphere Interview.

We will come back shortly to moral reasoning when we discuss consciousness as a whole, but we should note here that moral reasoning, like intelligence, requires discrimination. In this sense Nidich’s research supports the idea that Maharishi’s Vedic Science based education significantly improves abstract reasoning ability.

**Values and attitudes.** The study of values and attitudes is largely the analysis of that which is held as important to an individual and therefore motivates behavior. Over an extended time, the combination of interests and habits may be viewed in educational measurement as the structure of the individual personality.

A study that focused exclusively on values of MIU students was conducted by Gelderloos (1987). He used an in-depth measure of values containing both cognitive and affective dimensions, based on a structured interview after Hermans (1976). He interviewed 15 students from MIU and compared them with 15 undergraduates from a nearby university in a nine-month cross-sectional and longitudinal study. To control for possible interviewer bias, non-meditating interviewers and raters were employed, and double-blind procedures were used in the evaluation process. In addition, subjects and interviewers were not informed of the purpose of the study until after the posttest.

At pretest MIU students, compared with controls, scored significantly higher on all five cognitive value dimensions of psychological health: unifying ability, autonomy, intrinsic spirituality, creativity, and directedness. They began higher also on the two affective dimensions, well-being and integration. Over the nine-month experimental period the MIU students grew more than the controls in five of the seven value areas: autonomy, spirituality, creativity, well-being, and integration.

This study constitutes an important addition to the prior existing body of research because it employed research methods (rated interviews) which are sensitive to the more global, subjective educational outcomes. While these outcomes are an explicit aim of Maharishi’s Vedic Science based education, they are also central to all of liberal education.
Gelderloos notes this when he concludes, “This [research] suggests that there is no reason for education today not to achieve its original goal of developing holistic, well-integrated individuals as well as providing professional training” (1987, p. 486).

The other major study of values and attitudes among MIU students is found in the alumni survey data collected by the University’s Office of Evaluation. This research focuses directly on student satisfaction with the University.

The 1987 Alumni Survey. Another source of data on the effectiveness of educational institutions, as Pace has shown, is surveys of graduates. Findings from this research are especially important because they represent the most direct measure available of long-term satisfaction among those individuals whom the institution is designed to serve, its students. Furthermore, because satisfaction — or fulfillment — is one of the central goals of education according to Maharishi’s Vedic Science, the level of students’ satisfaction with their lives is an important indicator of a Vedic Science based university’s success.

Four surveys (1979, 1981, 1984, 1987) have been conducted in the past using the questionnaire of the American College Testing (ACT) Program. Responses to this questionnaire allow MIU to compare its alumni with those of approximately 90 other institutions that have used the survey between 1983 and 1986 (38,000 entries total). The findings from these surveys have been consistent over the separate administrations at MIU. Yet because previous surveys combined graduates and undergraduates, we use only the figures from the most recent survey to obtain a purer measure of the effectiveness of the College of Arts and Sciences.

Two mailings of the ACT survey were sent to 500 MIU undergraduate alumni between November, 1987, and February, 1988. Of these, 268 (49%) surveys were returned and subsequently scored by the ACT Evaluation/Survey Service. The respondents were well distributed among the 12 years of MIU’s graduating classes (1976 through 1987). For the MIU group the mean number of years since graduation was 4.5, compared with a mean for the ACT reference group of well over 10 years.

One striking finding in this administration, as well as previous administrations, of the survey is the high level of motivation for higher learning found among MIU graduates when compared with the national reference group. Summing the total percentages over all advanced degrees, the MIU group compared with the reference group shows 10% more alumni intending to pursue graduate degrees after their B.A. or B.S. As we can see from Table 2, the greatest distinction is found in aspirations for the Ph.D. degree. Here there is more than a 20 percentage point spread between the MIU group and the national reference group. MIU students’ level of aspiration for higher degrees indicates the high value they place on knowledge for personal and professional development — on the ability of knowledge to inspire and transform their lives.

The other finding that is consistent among the several administrations of this questionnaire is that, compared with the national reference group, MIU graduates rate very highly the contribution MIU has made to their lives. When asked, “Regardless of financial benefits, has college improved the quality of your life?” 91% of MIU alumni responded “definitely yes,” compared with 69.8% of the national reference group. Similarly, the number of MIU alumni who said that the university prepared them
TABLE 2
DEGREE ASPIRATIONS OF ALUMNI

<table>
<thead>
<tr>
<th>Highest Degree Planned</th>
<th>MIU</th>
<th>National Reference Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masters</td>
<td>31.5%</td>
<td>44.8%</td>
</tr>
<tr>
<td>Ph.D.</td>
<td>41.6%</td>
<td>18.4%</td>
</tr>
<tr>
<td>Professional</td>
<td>8.7%</td>
<td>6.8%</td>
</tr>
<tr>
<td>Totals</td>
<td>81.8%</td>
<td>70.0%</td>
</tr>
</tbody>
</table>

“exceptionally well” for their continuing education is 25 percentage points higher than the national reference group.

On another dimension of success after graduation, MIU alumni indicate a high degree of satisfaction with the University in the preparation it provided them for their careers. When asked how well their college prepared them for their current occupation, 89% of MIU alumni reported they were adequately prepared, compared with the national reference group’s 81%. Most notable, however, is the percentage who felt their college prepared them “very well” for their current occupation. Among MIU alumni, 63% responded “very well,” compared with a national figure of 32.4% (the choices were “very well,” “adequately,” “poorly,” or “not at all”).

The last finding from the alumni survey relevant to this discussion was that MIU alumni overall have a very high level of satisfaction with their alma mater. When asked whether they would choose the college again, 79.8% said “definitely yes,” compared with 29.8% in the national reference group (the choices are “definitely yes,” “probably yes,” “uncertain,” “probably no,” and “definitely no”). Of transfer students asked how they would compare the quality of the education at this college with that of other colleges, 83.6% of MIU alumni responded “better,” compared with 35.3% in the national reference group, and 46.0% in the sub-group composed of private colleges only. When questioned more closely on the degree to which their college contributed to 24 different aspects of personal and professional growth, MIU students were above the reference group on 23 of the 24, with an average difference of 26.5 percentage points. The two aspects where MIU alumni felt their college experience contributed most to their development were “caring for your own physical and mental health,” and “understanding the interaction of man and his environment.”

It seems clear from the data gathered on surveyed alumni that the level of satisfaction students express with their education at MIU greatly exceeds the level found in college alumni generally. Even more important is their high level of motivation for higher

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2 Using current salary as another indicator of success after graduation, the MIU alumni seem to be achieving a level of success comparable to students from other more established universities. The national average salary for alumni in the ACT reference group is $22,061. The average for the MIU group is $23,559. This figure is notable particularly in light of the fact that the MIU alumni have been in the work force for a much shorter time on average, and a sizable proportion (22%) of them have chosen to donate time to Maharishi’s Transcendental Meditation movement on at least a half-time basis. A separate analysis was done for those alumni who were not volunteering at least half of their time, and their average salary was found to be $27,239, substantially higher than that for the reference group.
degrees and their overall satisfaction with the contribution college has made to the quality of their life. The former indicates approval for MIU as an individual institution. The latter findings demonstrate the effectiveness of the Vedic Science based system of education implemented at MIU, a system which can be incorporated into any university.

**Research that Expands the Scope of Higher Education Assessment**

Several areas of research on the impact of Maharishi’s Vedic Science based education go beyond the usual paradigm of educational evaluation. Specifically, three areas that MIU has pioneered are the impact of college on (a) consciousness as a whole, (b) physiology and health, and (c) societal trends.

**The effect of Vedic Science based education on consciousness as a whole.** Educational reformers, from Plato onwards, have emphasized development of “the whole person,” but little attention has gone to measuring such an abstract entity. Even Winter, McClelland, and Stewart (1982) in their study of liberal education settled for outcome measures such as dealing flexibly and consistently with rational argument, and showing less egotism and more maturity in one’s response to authority figures. In contrast, several researchers on Maharishi’s Vedic Science based education have concentrated their efforts on understanding the development of consciousness as a whole, based on the understanding that body, mind, and environment all have a common origin in pure consciousness.

The research cited above on intelligence at MIU is relevant to the assessment of the development of consciousness because intelligence is a very general measure of intellectual functioning, predicting 35 to 50% of the variance in academic or occupational performance (Sax, 1980). Nevertheless, it is still far from a measure of consciousness as a whole. The research on electroencephalographic (EEG) change with the TM and TM-Sidhi program, showing intra- and inter-hemispheric coherence, is another broad measure of mental functioning which offers more promise as a measure of the degree of communication or shared information in the brain (Haynes, Hebert, Reber, & Orme-Johnson, 1977). A review of a number of studies has shown that EEG coherence is correlated with a broad variety of performance tasks, including creativity, the paired Hoffman reflex, grade point average, IQ, moral reasoning, and concept learning (Alexander, Boyer, & Alexander, 1987). EEG coherence thus may be the most successful physiological measure to date of the development of consciousness as a whole.

In contrast to these objective, though indirect, means of measuring the overall development of consciousness, Alexander (1982) and Alexander et al. (1987) have developed a measure based on the subjective descriptions of states of consciousness in Maharishi’s Vedic Science. This measure uses statements in simple, direct language which the subject has to rate as descriptive or not descriptive of his or her experience. Many of the descriptions correspond to predicted experiences in the development of higher states of consciousness as set forth in Maharishi’s Vedic Science. Research with adults using this “States of Consciousness Inventory” represents a potentially fruitful approach to the assessment of the growth of consciousness students undergo at Vedic Science based institutions.

The only study to date (Cranson et al., 1989) using this method on Vedic Science based education included an elaborated version of a descriptor from Alexander’s earlier questionnaire which asked for subjects’ experience of inner wakefulness during sleep.
Inner awareness during sleep, called “witnessing sleep” (Maharishi Mahesh Yogi, 1969), is according to Maharishi’s Vedic Science one of the most reliable signs of the growth of higher states of consciousness that develop spontaneously through the regular practice of Maharishi’s TM technique. Specifically witnessing sleep signifies the dawning of cosmic consciousness, the first stable higher state of consciousness (after sleeping, dreaming, waking, and transcendental consciousness). Cranson found that MIU students ranked above controls from another university on the reported frequency of witnessing during sleep, with a mean score of 3.2 on a scale of 11; and they made significant progress in a two-and-a-half-year interval to a score of 3.8. Two more studies with MIU students are in progress using this same questionnaire.

The effect of Vedic Science based education on physiology and health. In an age as conscious as ours of stress and its effects on the body, few doubt anymore the importance of a sound and relatively stress-free physiology to effective mental performance. Yet no college assessment programs, to our knowledge, have looked at the effect of college on health and physiological functioning.3

As discussed above, research on Maharishi’s Transcendental Meditation and TM-Sidhi program with adults and college students has demonstrated the physiological benefits of this educational technology. Studies specifically on Maharishi’s Students’ TM-Sidhi Course by Wallace et al. (1983) found improvements in the overall tone of the nervous system as measured by the paired Hoffman reflex recovery. Similarly, Orme-Johnson (1982) developed a model of the functional integration of the brain using levels of inter-hemispheric and intra-hemispheric coherence of the brain waves. Compared with meditating controls who did not take the TM-Sidhi course, he found, among those who completed the course, increases in coherence at the alpha and theta frequencies from all pairs of electrodes.

Current research on the effects of Maharishi’s Vedic Science based education at MIU is using brain wave evoked potentials as a measure of nervous system functioning, and includes a health questionnaire to directly measure the impact of the institution on students’ health.

The effect of Vedic Science based education on the environment. All students, faculty, and staff of Maharishi International University gather together twice daily to practice Maharishi’s Transcendental Meditation and TM-Sidhi program. The research described above has measured the influence of this technology on the mind and body of the individual; yet the effects of the technologies of Maharishi’s Vedic Science are not limited to the individual. A large, rapidly expanding body of research demonstrates that these technologies have a measurable, positive effect on the environment as well.

3 Thanks to a recent publication of the Assessment Forum of the American Association of Higher Education (Pasko, 1988), it is possible to gain a perspective on the entire range of assessment currently underway in higher education institutions. Of the 28 undergraduate institutions whose assessment programs are summarized in this brochure, 14 use some measure of achievement, and 14 (some of the same ones) use a measure of academic skills (usually the College Outcome Measures Project of the American College Testing program or the newly launched Academic Profile offered by the Educational Testing Service). Only three are looking at changes in personality, with an additional two that are interested in learning styles. Eight employ some surveys of students’ values or interests, usually that of the UCLA-based Cooperative Institutional Research Program, and not usually for the purpose of longitudinal comparisons. Only one university reported measuring basic abilities or traits such as creativity or intelligence. In this case it was moral development. Therefore, one can fairly say that there are still few efforts to measure changes even in basic mental abilities, and none reportedly including physiological maturation.
MODERN SCIENCE AND VEDIC SCIENCE

Though the mechanism responsible for these environmental effects has only recently been explored in terms of modern science, the mechanism has long been a central theme of Maharishi’s Vedic Science. As explained above, according to Maharishi’s Vedic Science, the basis of individual consciousness is the same as the basis of the physical and social environment. Thus, when the individual contacts the pure intelligence at the basis of his own thought and action through the subjective technology of Vedic Science, he simultaneously enlivens the field underlying the total environment. Included in the environment is the “collective consciousness” of society, which Maharishi defines as a wholeness that is more than the sum of the influences of each individual consciousness in the social group. According to Maharishi’s Vedic Science the unified field at the basis of collective consciousness is by nature orderly and evolutionary, and thus when enlivened by individual consciousness these qualities are strengthened in the society as a whole.

The practical relevance of this theory for education is that when students are brought together in a Vedic Science based educational institution, they make a direct contribution to the overall quality of life in the whole society just by practicing the Transcendental Meditation program. Research has shown (Borland & Landrith, 1977) that the number necessary to have a significant influence is only one percent of the population affected.

The TM-Sidhi program has an even more pronounced environmental impact than the TM program, and this impact can be strengthened further by practicing the technology in a group. Based on physical models from macroscopic quantum phenomena, the formula used to predict the extent of the environmental effect for the group practice of the TM-Sidhi program is the square root of one percent ($\sqrt{1\%}$) of a population. Therefore, Maharishi International University has set as a goal for itself to have enough people collectively practicing the TM and TM-Sidhi program each morning and afternoon to increase coherence in collective consciousness and thereby improve the quality of life in all of North America. This number is currently 1600, or approximately $\sqrt{1\%}$ of the population of the U.S. and Canada (“The Sociology of World Peace,” 1979).

In an article on the application of Maharishi’s Vedic Science and its technologies to the creation of world peace, Orme-Johnson and Dillbeck (1987) review over 25 studies on the effect of the individual and group practice of the TM and TM-Sidhi program on social indicators. This effect, known as the “Maharishi Effect,” has been found in a variety of indicators of social health. The most dramatic evidence of the Maharishi Effect has been in the reduction of violence in international trouble spots. For example, a recent analysis of the influence of a group practicing the TM and TM-Sidhi program in Jerusalem during the Lebanon war found that on days of high attendance in the group assembly, war deaths in Lebanon dropped an average of 76% (Davies, 1988).

On the whole, however, the majority of the studies on the environmental impact of the TM and TM-Sidhi program have been done on the quality of life in peacetime. Among these, five have been conducted using primarily the students, staff, and faculty of MIU. These have shown that the MIU group program has had a positive influence on the overall quality of life in the United States from 1960 to 1984 (Orme-Johnson, Gelderloos, & Dillbeck, 1988); on the monthly U.S. and Canadian inflation and unemployment rates—“the misery index” (Cavanaugh, 1987); on notifiable diseases and traffic fatalities in the United States (M.C. Dillbeck, Larimore, & Wallace, in press); and on
the violence index in the U.S. as a whole. Similar research on the group of students, faculty, and staff at MIU’s branch in Washington, D.C., demonstrated the same influence on an urban population. Bandy and Lanford (1984) found that on days when the number of participants in the group program at the campus exceeded a predicted threshold of 400 there was a significant reduction in daily violent and property crimes in the District. In a related study from August, 1980, to November, 1983, Lanford, Dixon and Reeks (1984) found that homicides in the capital decreased by 22% \((p < .02)\) during weeks when the group size was 400 or greater.

These studies of the impact of the group practice of Maharishi’s TM and TM Sidhi program at MIU on the quality of life in the nation, taken together with the more than 20 other studies in the Orme-Johnson and Dillbeck review, provide extensive scientific evidence for the positive benefit of a Vedic Science based institution to its environment. They present an opportunity, previously unavailable to educational institutions, to make a direct and immediate contribution to the peace, harmony, and well-being of their society as a whole.

These three extensions of traditional college assessment complete our review of the research on Maharishi International University. It is clear that Vedic Science based education at the post-secondary level has a very broad effect, and that the effect is at a deep level of the personality. How do we make sense of these outcomes? And what are the implications of this research for addressing the problem of substance in higher education? We will remember that substance, as defined here, involves both the knowledge that is offered and the abilities that proceed from that knowledge. The next section summarizes the research on Maharishi’s Vedic Science based education and relates it to the knowledge offered by an institution.

IV. A Comprehensive Model of Change in Maharishi’s Vedic Science Based Education

Research on college impact is a relatively young field, first summarized by Feldman and Newcomb in their 1973 compendium. Similarly, research on Vedic Science based education is only as old as Maharishi International University, founded in 1971. The findings reviewed in this article, therefore, represent only the beginnings of research in this field. In order to achieve a more comprehensive understanding of the impact of Mahariishi’s Vedic Science based education, this section looks more deeply at the hypothesized mechanism by which Maharishi’s Vedic Science based education transforms the lives of students in the four years or so that they spend in it. Here we integrate the empirical research presented above with theory from education and from Vedic Science, as well as interviews with MIU students.

The Nature of Change in Maharishi’s Vedic Science Based Education

To understand change during college, one must integrate the objective findings of the research with the subjective experience of students pursuing their degrees. In order to gain insight into students’ perspectives, the author conducted 23 interviews of first-, second-, and fourth-year students. We begin, however, with an overview of the objective results.
The empirical research covered in Part III of this article is available in summary form in Appendix A, according to the major areas of environment, body, mind, and consciousness as a whole, and in Appendix B according to the goals of MIU. By "consciousness as a whole" here we refer to individual consciousness as a whole, an area addressed directly in the evaluation research by Alexander et al. (1987) and Cranson et al. (1989). The research as a whole may be further condensed according to the dependent variable and the direction of change of each, as in Table 3.

| TABLE 3 |
| SUMMARY OF RESEARCH ON MAHARISHI INTERNATIONAL UNIVERSITY |

| Environment | Increase in the composite index of quality of life for the United States |
|             | Decreases in the monthly “misery index” (a composite measure including the inflation and unemployment rates) for the United States and Canada |
|             | Decreases in motor vehicle fatalities |
|             | Decreases in the weekly index of fatalities due to violence |
|             | Decreases in violent and property crimes in the District of Columbia |

| Body | Increased flexibility of the nervous system* |
|      | Increased functional integration of the brain (seen in EEG coherence)* |

| Mind | Increased field independence |
|      | Increased creativity* |
|      | Increased fluid intelligence |
|      | Higher levels of moral reasoning** |
|      | Increased psychological health and well-being as reflected in value structure (including increased autonomy, spirituality, creativity, well-being, and integration) |

| Consciousness as a Whole | Increased levels of alertness as measured in self-report of “witnessing sleep” |

* Studies of Maharishi’s TM-Sidhi program, an aspect of the MIU curriculum
** Cross-sectional studies

From this overview one can make several generalizations about the impact of Vedic Science based education:

1. The change resulting from Maharishi’s Vedic Science Based Education is comprehensive, with a range from Self to society — intellect, emotions, and physiology are cultured simultaneously;
2. The change is uniformly positive in direction;
3. From several measures such as EEG coherence, moral reasoning, intelligence, value structure, and alertness, one sees that individual life is being influenced from a deep, integrating level — a level not usually affected by the modern science based approach of contemporary education;

4. From the results on the Academic Profile one can conclude that students receive a quality education in the traditional skill and content areas at the same time that their development is accelerated;

5. The observed changes in students’ learning and development do not reflect selective admissions practices and therefore are relevant to the vast majority of higher education institutions.

The interviews with MIU students both support and explain these generalizations that emerge from a consideration of the objective research. When students were asked what had changed the most, they mentioned outcomes that reflected many of the traditional goals of a college education such as gaining the tools necessary for the pursuit of a profession or learning to apply knowledge to practical situations. They also mentioned changes resulting from specific emphases of the MIU curriculum — for example, improved public speaking ability or improved ability to work in groups — and many of them mentioned gains in general knowledge.

The interviewed students were very articulate, however, in identifying changes, some quite subtle, that most educators would recognize as important goals of higher education, but of which students are not usually conscious. Several of the students, for example, mentioned changes in their manner of thinking. The following statement from a fourth-year student from Kenya is one example:

My thinking has changed now. Actually, I think in terms of all possibilities, not in terms of limitations and bounded possibilities; something which would have taken me a long time to come to where I am, if I had not come to MIU. Some people in thinking about the resources — for example, the limitations of oil — become very depressed. Now I feel that whatever the mind can perceive, it can achieve. Everything is a matter of thinking. My thinking has changed a lot.

The same student noted also that his awareness had broadened, that he was able to keep in mind a broader range of possibilities when planning any action.

Another student, an American student in her second year, expressed a general change in the sharpness and clarity of her thinking that was mentioned by many of the students interviewed: “My intellect,” she said, “has become a lot sharper; my thought processes are clearer and it doesn’t take me as long to get an answer — things come to my head faster.”

Finally, with respect to general changes in thinking, one student expressed clearly a change in his consciousness as a whole, which is characteristic of the development of higher states of consciousness and which helps explain the results that Cranson (in press) found in his study of witnessing sleep. In this development, the mind becomes so familiar with and well established in the Samhita value of pure consciousness, the ground state of human awareness, the total potential of natural law, that it is able to maintain this perfectly silent, self-referral state of consciousness throughout the waking.
dreaming, and sleep states of consciousness. As a result the individual becomes balanced, clear, and perceptive; able to maintain unboundedness along with boundaries; and able to act spontaneously in accord with the progressive values of natural law. The following comment of one student expresses what several mentioned to us:

I feel very much stronger within myself. I feel basic joy and happiness, comfortable in diverse situations, being able to give more and need less from my environment. The biggest factor in my changing attitudes seems to be my deepening [Transcendental Meditation and TM-Sidhi] program experience. This supplies a value of witnessing experience which is the foundation for successful day-to-day activity.

Apart from changes in style of thinking, students also mention what could be considered even more subtle changes in personality resulting from MIU’s educational system. They mention greater interest in acquiring knowledge; this helps explain the differences found between alumni from MIU and those from other colleges in their interest in advanced graduate study. They say that they have become more comfortable with knowledge and that they feel closer to it.

Because the relationship between the individual and the knowledge an institution has to offer is an important theme of this paper, it is useful to quote one student who gave his experience with this aspect of change. This young man, an American student, was interviewed in his second year:

I noticed a change on a subtler level in how I related to knowledge. At MIU when I sit down to a test I feel the relationship between me and the knowledge is close. When I walked into a test in my previous college, in the exact same course, it was far removed. There was a cloud between me and the knowledge. With the same kind of test here I was very comfortable. I was able to see the reflection in myself of the knowledge. It made the exam much easier for me.

Finally, many students mentioned greater happiness as the single most important change they had noticed resulting from their education at MIU. This description by one young man from Japan is typical of many:

My friends told me that when I first came here I was very quiet and unsocial. However, they said that my face became brighter and brighter as the days went by. They are so impressed at how much I have grown in one year.

Among all the changes that students mention, the most significant for understanding the effects of Maharishi’s Vedic Science based education are those which show not a directional shift in personality, but an overall balancing, an integration of personality. This integration is often expressed as a gain in an area that the student previously felt was deficient. Several brought out entirely in their own words the increasing integration that they felt occurring. Said one second-year student, “There is a great integration between heart and mind. I have found balance between heart and mind to be the key to success in action.”

From our research and interviews with MIU students, this integration or balance of heart and mind, mind and body, inner and outer realities, appears to be the most pervasive and yet subtle outcome of Maharishi’s Vedic Science based education.
What Causes Change?

Empirical research on the relative contributions that various aspects of Maharishi’s Vedic Science based education make to an individual’s development is relatively new. The studies we have reviewed used as an independent variable either the institution as a whole, Maharishi’s TM-Sidhi program, or the numbers practicing their meditation program in a group. Therefore, the isolated contributions of the knowledge, the experience, the teaching techniques, or the environment have not been assessed empirically. We have tried in interviews, however, to sort out the various factors influencing change. In this section we present the insights generated by these interviews.

When students were asked specifically what has brought about the changes they had experienced, they mentioned many of the dimensions of college life that are considered conditions for impact at any university: caring professors, relationships with their fellow students, and specific courses or programs. From these comments many of the factors for impact described by Chickering, Astin, and Winter et al. could explain the effectiveness of Maharishi International University. The university is a manageable size, has clear and consistent goal statements, and faculty who are committed to a clear set of values of their own. In addition, MIU provides students with many opportunities to integrate the vast amounts of new knowledge which college inevitably showers on them and gives them a sense of being special because they are part of a university with a clearly articulated mission for the improvement of society.

Other comments which students make, however, go beyond the traditional conditions for impact. For example, some students mentioned the high level of friendliness that develops among members of the MIU community. Students who have attended other institutions consistently cite the level of openness, tolerance, and support among students and between students and faculty as one of the most distinctive features of MIU.

Another unique condition for impact brought out by students is the teaching techniques unique to Vedic Science based education. As mentioned above, all subjects are taught using unified field charts, main point charts, and unity charts. One young woman explained that in her previous university it was often difficult to “gauge” a lecture. Without a detailed syllabus it was easy for the professor to “get off on a tangent.” At MIU, she noted, particularly in the disciplines with which she had less familiarity, the main point charts and the unified field charts helped provide a coherent and unified picture of the subject matter. “You can see visually what is going on,” she said, “as well as hear. It helped me integrate a lot of things that came only with difficulty before.”

The third source of change unique to Maharishi’s Vedic Science based education is Maharishi’s Transcendental Meditation and TM-Sidhi program. Many students mentioned these technologies of Vedic Science as the most influential source of change for them. Said one student from Malaysia,

Looking back, it is quite hard to imagine how a person like me could flourish so much in such a short period of time. If I had to single out an element that is responsible for it, I keep coming back to Maharishi’s technologies of consciousness.

Another student, one already quoted above as experiencing increasing “witnessing value” due to his practice of the TM and TM-Sidhi program, attributed his increasing integration
of heart and mind to the deeper, more integrative levels of the mind that he experienced during this program.

**Maharishi’s Vedic Science as a source of change.** The final discovery in analyzing with these students the sources of change at Maharishi International University was one which we take to be the organizing principle for understanding MIU’s unique effectiveness. One student, when questioned about the elements of a college education — the teachers, other students, the curriculum, and the physical facilities — stopped the line of questioning for a moment. The greatest influence, he said was “the knowledge of Maharishi’s Vedic Science.” In exploring his answer, it became clear that he did not refer solely to his experiences of growth of consciousness during the group practice of Maharishi’s Transcendental Meditation and TM-Sidhi program, or to the knowledge in texts alone. He was not thinking primarily of the theoretical or applied knowledge of Vedic Science he had gained through lectures and class discussions, or even of the practical principles about the development of consciousness that he had gained through discussions outside of class with friends and faculty. In probing further, he seemed to be referring to something larger that encompassed all of these. He was referring to an integration of theoretical and practical knowledge, an integration of understanding with experience of the deepest levels of consciousness.

Other students were less direct in expressing this same idea. One young woman, quoted above in reference to the integrating of heart and mind, had difficulty locating the source of change in her life. “It’s so subtle,” she said, “I can’t put my finger on it. It’s something to do with my schooling, with the environment [structured at MIU]. It’s many different variables.” She also was searching for a term that could encompass more than her experience or her intellectual understanding. This something we feel is the unique integration of knowledge available in Maharishi’s Vedic Science, the science of the Samhita value of consciousness where theory and practice come together as one expression of knowledge, where the knower is the known.

Thus, even though it seems almost tautological on the surface, what we have come to in our analysis of the research, the survey findings, and the interviews we have conducted, is that the most significant factor in any system of education is the knowledge that it offers — but knowledge in the deepest sense, knowledge that is structured in one’s physiology. Hence in Vedic Science based education, the most significant change agent for students’ lives is Maharishi’s Vedic Science — not the intellectual descriptions alone, nor the experience alone, but the organized experience, the directly experienced understanding of the most fundamental level of reality at which the knower is the known. This understanding and experience represent knowledge in its purest and most powerful form (cf. Maharishi Mahesh Yogi, 1969, p. 312 on “knowingness”).

This discovery helps explain the difficulty faced by most higher education institutions today. For here, too, knowledge in this deeper sense of lived knowledge is the most powerful agent for change, but the knowledge which is lived by the students is at a level which lacks the unifying and integrating qualities of pure consciousness, the Samhita value of consciousness. Thus, instruction in physics lacks the experience of that most orderly and energetic level of consciousness, which is the home of all the laws of nature, the unified field. Instruction in mathematics lacks the experience of the field of
all possibilities, which is the universe of sets, the foundation of mathematical theory. Instruction in physiology lacks the experience of the self-interacting dynamics of consciousness which is the basis of the functioning of DNA, the totality of information at the basis of physiology. In every field, lack of the experience of the basis of human consciousness deprives the discipline of the knowledge of its deepest, most fully unified, most fully integrated level. The effect of this knowledge on the life of the student, therefore, is substantially less than an education that provides this experience.

This significance of knowledge for college impact has been expressed in graphic form in a model of college impact presented in Figure 2. The model shows the relation between the various factors that interact to generate "the college experience" and which lead ultimately to the outcomes of college. Thus it is an "Outcome Model for Higher Education." It provides a synoptic view of the major factors which determine the effectiveness of a higher education institution or system and lead to the outcomes of that system.

Because the process variables — those variables which together compose the educational program — stand in an immediate relation to time, they are the ones which, as the graphic indicates, are connected to the knowledge and experience of college. By knowledge here we refer not only to the disciplinary knowledge which most professors consider their primary responsibility, but also to the more practical knowledge of life conveyed explicitly and implicitly in the conduct of the faculty.

In the standard model of college outcomes, the model would stop at this level of knowledge, explicit and tacit, that drives college life. Knowledge in a Vedic Science based institution, however, is integrated and unified by the experience and understanding of a single source for all of the methods and findings of the disciplines — the Samhita of knower, known, and process of knowing. The components of Maharishi’s Vedic Science Based Integrated System of Education described above — the technologies of Maharishi’s Vedic Science, the knowledge of Vedic Science, and the SCI based teaching techniques — all contribute to this integration and unification of knowledge.

Any or all of these components of Vedic Science based education can be — and have been — easily incorporated into any educational system. At MIU they are all employed systematically for the maximum growth of the students.

S.L. Dillbeck and M.C. Dillbeck have shown in some detail (1987) how these components are used in Vedic Science based education and have given a full rationale for each. For our purpose it is necessary only to emphasize that these components are derived from the knowledge and experience of Maharishi’s Vedic Science and that they serve as the means by which teaching faculty connect the knowledge of the discipline to Vedic Science.

This outcome model is meant to present at a glance the logical relationships among the many factors contributing to the impact of a college. It includes those factors found in institutions based on Maharishi’s Vedic Science, but is not meant to be limited to such institutions. It presents in graphic form two of the major conclusions of this paper, (1) that the knowledge offered by an institution is the most fundamental level causing change among students, and (2) that the most significant outcome of higher education is the most general one—the degree of integration, balance and wholeness gained in individual and collective life.
Figure 2. This model depicts the projected relationship between the input, process, and outcome variables in higher education. The grey highlighted boxes are added to the traditional model to explain the contributions of Maharishi's Vedic Science based education. Key to this model are the proposed foundational role which knowledge in general and Vedic Science especially plays in education; and the holistic goals of balance, integration, and wholeness which should result from the educational process and which develop reliably and rapidly through the addition of Vedic Science to the knowledge base.
Summary and Conclusion

We began this article by stating that the challenge in higher education today is a challenge of substance. According to this view, our educational institutions are not addressing the transcendent issues that give meaning to students' lives. Based only on the objective, surface values of knowledge, they expect too little of students and hence deliver too little. The proposed cause for this shortfall has been the unavailability to most institutions of knowledge of the absolute basis of the knower and how to develop this fundamental element of the process of education.

In reviewing the research on college impact, the lack of this knowledge was brought out strongly in Astin's findings which show that it is the peer culture rather than the classroom that thus far has accounted for the main effects of college. The scarcity of significant effects in the crucial areas of human development also highlights the concern over the substance of a college education.

In contrast, the research on Maharishi's Vedic Science based education at MIU shows that students are developing in factors, such as intelligence and field independence, that previous research indicates do not typically develop among college students. In addition, findings on the physiological changes, the development of consciousness as a whole, and the societal effects resulting from the group practice of the technologies of Vedic Science, have expanded the arena of college impact to include a much broader and deeper range of effects than previously thought possible. The figures reported for the alumni surveys reinforce the more objective findings in that they show graduates' remarkably high level of satisfaction with the long-range benefits gained in college. Both sets of findings should inspire a renewed hope in the efficacy of higher education, as well as an expanded idea of what may be conceived as assessment.

Institutions based on modern science and its objective approach to natural law have been found unable to significantly affect the deeper levels of the students' lives. Maharishi International University, by contrast, shows that it is possible, by placing Maharishi's Vedic Science at the basis of the educational experience, to develop the latent mental and physiological potential of the student toward higher states of consciousness. Research on basic knowledge and skills of MIU students indicates that through Maharishi's Vedic Science based education the development of consciousness occurs simultaneously with the growth of the information and skills necessary to play a productive and successful role in society. Finally, research on the "Maharishi Effect" indicates that development of consciousness among students also has a measurable, positive environmental impact that benefits society at large.

From the theory and research we have arrived at two conclusions, significant both for future research and for contemporary practice: first, that the growth of consciousness expressed in increasing integration or balance is the most subtle and important outcome of Vedic Science based education; and second, that the primary agent for this achievement is the knowledge an institution has to offer. Further, we have concluded that it is the knowledge and experience of the self-interacting dynamics of consciousness at the source of creation, available in Maharishi's Vedic Science, that accounts for the rapid and integrated progress experienced by students at MIU.

These dynamics of cause and effect in the educational process are explained most
clearly and concisely in the language of Vedic Science itself, particularly in the Rig-Ved, which Maharishi describes as the essence of the Vedic literature. One verse in the first mandala (chapter) of the Rig-Ved explains this precise connection between the knowledge of the self-referral state of consciousness and balance or integration of life. The verse expresses, according to Maharishi, the essence of his Vedic Science and its application to human life:

Richo akshare parame vyoman  
Yasmin deva adhivishve nisheduh  
Yastanna veda kimricha karishyati  
Ya ittavidus ta ime samsate
(Rig-Ved I.164.39)

Maharishi (Maharishi Vedic University, 1985) translates:

The verses of the Ved exist in the collapse of fullness  
(the Kshara of “A”) in the transcendental field,  
In which reside all the devas, the impulses of creative intelligence,  
the laws of nature responsible for the whole manifest universe.  
He whose awareness is not open to this field,  
what can the verses accomplish for him?  
Those who know this level of reality  
are established in evenness, wholeness of life. (p. 101)

The first half of this verse presents the theme of self-referral and sequential transformation by which the unified field, the Samhita, the field of unity, becomes the field of diversity. The second half of the verse presents the possibility of direct experience of these mechanics, and the value for human life of that experience. In the terms that we have used in this paper, the verse implies that unless students are allowed to understand and experience the Samhita of consciousness at the basis of their lives, the rest of the knowledge they gain in the disciplines will be of little use to them. As they experience the underlying reality of the unified field, however, the knowledge of the full range of the discipline will bring evenness and wholeness to their lives.

Students at MIU describe clearly these mechanics of transformation in their own lives. They describe the growing integration or balance of life and they attribute it directly to their growing knowledge of Maharishi’s Vedic Science, which presents, above all, the knowledge of the Samhita of knower, known, and process of knowing. The “Richo Akshare” verse of the Rig-Ved, therefore, expresses the beginning and end of knowledge as found in the lives of MIU students.

From the perspective of Maharishi’s Vedic Science based education, one can envision a time when higher education institutions will eliminate their current problems, including their fundamental problem of substance. Maharishi has clearly expressed this possibility:

All the problems of education — and further — all problems of life anywhere in the world or in heaven, arise from inadequate education. . . . And the problems of education are the problems of knowledge. . . . This Vedic Science, this science of pure knowledge, delivers the fruit of all knowledge in everyone’s self-referral consciousness. In simple words, the fruit of all knowledge should mean the ability to know everything, the ability to do everything, and the ability to achieve anything. . . . The fruit of all knowledge will be delivered
to everyone in one’s own consciousness as soon as Vedic Science is an aspect of education. (Maharishi Mahesh Yogi, in press)

Beyond the difference Maharishi’s Vedic Science will make to every student, one can foresee an elevation in the role of faculty as they become able to give out scientific knowledge about the full range of life in its subjective as well as objective expressions. They will have an opportunity to regain their natural role as leaders in society. Educational institutions also will be able to fulfill their time-honored role in society by becoming centers of knowledge and organizing power.

We began on the hopeful note expressed by the publication of the recent calls for reform in higher education. We saw in these the rise in expectations that precedes any real progress in society. Based upon the achievements of Maharishi International University and the possibility of the expansion of this system of education to other institutions, however, more than hope is called for. Maharishi has said that “through proper education we can accomplish anything.” Through education he has predicted the dawn of a heavenly life on earth. This life is the natural outcome of the simple system outlined here. We end with Maharishi’s own offer to educators everywhere:

It is our joy to offer to the custodians of education in this generation a perfect, and yet simple system of education which will accomplish the goal of education — the creation of a perfect man and Heaven on Earth. (Maharishi Mahesh Yogi, 1988, p. 9)

References


Bandy, C., & Lanford, A. (1984). A time series analysis of the effects of the collective practice of the Maharishi Technology of the Unified Field on the reduction of crime in Washington, DC. Prepublication manuscript, Maharishi International University, Department of Psychology, Fairfield, IA.


Dillbeck, M.C., Assimakis, P.D., Raimondi, D., Orme-Johnson, D.W., & Rowe, R. (1986). Longi-


Note: Appendices follow on pp. 194-199.
## Appendix A. Summary of Research on Maharishi International University

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Dependent Variable</th>
<th>Design Type</th>
<th>Independent Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ENVIRONMENT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Bandy &amp; Lanford (1984).</td>
<td>Violent &amp; property crimes in the District of Columbia.</td>
<td>4 Days when more than 400 people were practicing the TM-Sidhi program collectively.</td>
<td></td>
</tr>
<tr>
<td>2. Cavanaugh (1987); Cavanaugh &amp; King (1988).</td>
<td>Okun’s “Misery Index” (combining the national inflation and unemployment levels) in the U.S. and Canada.</td>
<td>4 Weeks when Super Radiance threshold (approximately 1600 people practicing Maharishi’s TM &amp; TM-Sidhi program) was exceeded at MIU.</td>
<td></td>
</tr>
<tr>
<td>* Orme-Johnson &amp; M.C. Dillbeck (1987).</td>
<td>Dow Jones industrial average/Commerce Dept. “Leading Indicators.”</td>
<td>4 Days when Super Radiance threshold of $\sqrt{1%}$ of the U.S. population was reached at MIU.</td>
<td></td>
</tr>
<tr>
<td><strong>BODY AND BEHAVIOR</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Wallace, Orme-Johnson, Mills, M.C. Dillbeck, &amp; Jacobe (1983).</td>
<td>Flexibility of the nervous system.</td>
<td>3 Participation in the student TM-Sidhi course at MIU.</td>
<td></td>
</tr>
<tr>
<td>* Findings from studies already cited above</td>
<td></td>
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</tr>
</tbody>
</table>

KEY to Design Types: 1 = Cross-sectional or correlation study. 2 = Pre-post with normative data.
## Appendix A. Summary of Research (cont.)

<table>
<thead>
<tr>
<th>Actual Measure</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ENVIRONMENT</strong></td>
<td></td>
</tr>
<tr>
<td>Secondary analysis of publicly available daily statistics, 1980–1983.</td>
<td>On days when the Super Radiance threshold for Washington, DC was exceeded, there was a significant reduction in violent crime and property crimes in the District.</td>
</tr>
<tr>
<td>U.S. &amp; Canadian gov’t. unemployment &amp; inflation statistics.</td>
<td>The authors found a highly significant correlation between the numbers practicing the TM-Sidhi program at MIU &amp; the sum of the monthly inflation &amp; unemployment rates for both Canada and the U.S. between April 1979 and January 1987.</td>
</tr>
<tr>
<td>U.S. Public Health Service data and Dept. of Transportation statistics.</td>
<td>The index of violent fatalities went down with increasing numbers practicing Maharishi’s TM and TM-Sidhi program collectively at MIU.</td>
</tr>
<tr>
<td>U.S. Dept. of Transportation statistics.</td>
<td>Auto fatalities were reduced on days when the Super Radiance number was exceeded.</td>
</tr>
<tr>
<td>Secondary analysis of publicly available weekly statistics, 1980–1983.</td>
<td>Homicides decreased by 22% ($p &lt; .02$) in weeks during which the size of the group practicing the TM and TM-Sidhi program collectively was 400 or greater.</td>
</tr>
<tr>
<td>Secondary analysis of publicly available annual data reflecting quality of life (1960–1984).</td>
<td>The improvement in quality of life in the U.S. was proportional to the rise in the Maharishi Effect Index ($r = .8$).</td>
</tr>
<tr>
<td>Daily data on Dow Jones (1979–1985); monthly data on the Leading Indicators (1949–1985).</td>
<td>The Dow Jones industrial average increased by a mean .92 points per day ($p = .05$) the day after days when the threshold was reached. Leading Indicators significantly increased the month after months in which Super Radiance threshold was reached.</td>
</tr>
<tr>
<td><strong>BODY AND BEHAVIOR</strong></td>
<td></td>
</tr>
<tr>
<td>Recovery ratio for the paired Hoffman reflex.</td>
<td>At four out of the five latency intervals, males in the experimental group significantly improved ($p &lt; .05$ to $p &lt; .01$) over a 3-month period. Recovery ratio of the paired Hoffman reflex was later (Wallace, Orme-Johnson, Mills, &amp; Dillbeck, 1984) positively correlated with grade point average.</td>
</tr>
<tr>
<td>EEG coherence in the theta &amp; alpha frequencies measured during the TM technique.</td>
<td>Compared with controls, those participating in the TM-Sidhi course increased on the dependent variable in the 4 pairs of EEG leads measured. EEG frontal coherence was later positively correlated to math achievement (Nidich, Jones, Abrams, Orme-Johnson, &amp; Wallace, in press).</td>
</tr>
</tbody>
</table>

3 = Pre-post with control group.
4 = Time series (Box-Jenkins ARIMA impact assessment).
### Appendix A. (part 2)

<table>
<thead>
<tr>
<th>Author(s)</th>
<th>Dependent Variable</th>
<th>Design Type</th>
<th>Independent Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MIND: SENSES, DESIRES, AND THINKING</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Jones (1989b).</td>
<td>Achievement levels on skills and knowledge of a general education.</td>
<td>1</td>
<td>Institution</td>
</tr>
<tr>
<td><strong>MIND: INTELLECT</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Cranson, Alexander, Orme-Johnson, Jones, &amp; Gackenbach (1989).</td>
<td>Speed of mental processing.</td>
<td>3</td>
<td>Institution</td>
</tr>
<tr>
<td>12–14. Jones (1989a); Cranson et al. (1989); M.C. Dillbeck et al. (1986); Aron et al (1981).</td>
<td>Non-verbal fluid intelligence.</td>
<td>2, 3</td>
<td>Institution</td>
</tr>
<tr>
<td><strong>MIND: EGO</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Orme-Johnson &amp; Duck (1977).</td>
<td>Personality profile.</td>
<td>1</td>
<td>Institution</td>
</tr>
<tr>
<td><strong>CONSCIOUSNESS AS A WHOLE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>* Cranson et al. (1989).</td>
<td>Inner wakefulness while asleep.</td>
<td>3</td>
<td>Institution</td>
</tr>
</tbody>
</table>

* Findings from studies already cited above.
### Appendix A. (part 2 — cont.)

<table>
<thead>
<tr>
<th>Actual Measure</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MIND: SENSES, DESIRES, AND THINKING</strong></td>
<td></td>
</tr>
<tr>
<td>Computerized concept learning task after Bruner, Goodnow, &amp; Austin, 1956.</td>
<td>Students who took the TM-Sidhi course improved their efficiency of concept learning, compared with controls ($p &lt; .05$).</td>
</tr>
<tr>
<td>Group administered embedded figures test.</td>
<td>MIU students significantly improved from freshman to senior years ($p &lt; .005$).</td>
</tr>
<tr>
<td>The Academic Profile (Educational Testing Service).</td>
<td>Native English speakers scored in the 93rd and the 91st percentile on the two versions of the Academic Profile, a widely used test of general education.</td>
</tr>
<tr>
<td>Torrance Test of Creative Thinking.</td>
<td>Students participating in the course made significant improvements when compared with meditating controls who did not participate ($p &lt; .02$).</td>
</tr>
<tr>
<td><strong>MIND: INTELLECT</strong></td>
<td></td>
</tr>
<tr>
<td>Hick’s choice reaction time.</td>
<td>MIU students improved their performance compared with controls, who did not change ($p &lt; .005$).</td>
</tr>
<tr>
<td>Cattell Culture Fair Intelligence Test; Raven’s Progressive Matrices.</td>
<td>MIU students increased in their level of intelligence over 1 (Jones), 2.5 (Cranson et al.), and 4 years (Dillbeck et al.; Aron et al.) as compared with normative data as well as with controls from another institution (Cranson et al.) ($p &lt; .001$ to $p &lt; .005$).</td>
</tr>
<tr>
<td>Rest’s Defining Issues Test.</td>
<td>Meditating MIU students displayed a higher percentage of responses demonstrating principled reasoning than did non-meditators or those about to start the TM technique. Those practicing the TM-Sidhi program at MIU showed a rate still higher than the meditators.</td>
</tr>
<tr>
<td><strong>MIND: EGO</strong></td>
<td></td>
</tr>
<tr>
<td>Herman’s self-investigation interviews.</td>
<td>MIU students scored significantly higher at pretest on all dimensions of psychological well-being and integration and made significantly greater gains over 9 months in autonomy, spirituality, creativity, well-being, and integration, as compared with controls from another university.</td>
</tr>
<tr>
<td>Personal Orientation Inventory.</td>
<td>MIU students were significantly higher ($p &lt; .05$) than a reference group of other college students on the subscales of time-competence, inner-directedness, self-actualizing values, spontaneity, self-referral, synergy, acceptance of aggression, and capacity for intimate contact. Their profile was similar to a reference group of self-actualized people.</td>
</tr>
<tr>
<td><strong>CONSCIOUSNESS AS A WHOLE</strong></td>
<td></td>
</tr>
<tr>
<td>Self-report of frequency of witnessing during sleep.</td>
<td>MIU students showed increased frequency of “witnessing” nighttime sleep ($p &lt; .001$) compared with controls. Witnessing sleep, according to Maharishi’s Vedic Science, is an indicator of growth of higher states of consciousness.</td>
</tr>
</tbody>
</table>
Appendix B
Research Supporting Maharishi International University’s Long-Range Goals

The outcomes cited above can be summarized according to the initial seven goals of MIU. The research to date suggests that MIU is making significant progress in meeting these goals.

1. To develop the full potential of the individual
   - Increased flexibility of the nervous system* (Wallace, Mills, Orme-Johnson, M.C. Dillbeck, & Jacobe, 1983)
   - Increased functional integration of the brain* (Orme-Johnson, 1982)
   - High levels of achievement (MIU Evaluation Office data)
   - Increased field independence (M.C. Dillbeck, Assimakis, Raimondi, Orme-Johnson, & Rowe, 1986)
   - Increased fluid intelligence (Aron, Orme-Johnson, & Brubaker, 1981; M.C. Dillbeck et al., 1986; Cranson, Alexander, Orme-Johnson, Jones, & Gackenbach, 1989; Jones, 1989a)
   - Increased creativity (verbal fluency and flexibility)* (Orme-Johnson, 1982)
   - Greater efficiency of concept learning* (M.C. Dillbeck, Landrith, & Orme-Johnson, 1981)
   - Increased speed of mental processing (choice reaction time) (Cranson et al., 1989)
   - Higher levels of moral reasoning (Nidich & Orme-Johnson, 1982)
   - Higher levels of self actualization (Orme-Johnson & Duck, 1977)
   - Increased psychological health (Gelderloos, 1987)
   - More rapid growth of higher states of consciousness (Cranson et al., 1989)

2. To realize the highest ideals of education
   - High levels of motivation for higher degrees (MIU Evaluation Office data)
   - Higher levels of satisfaction with personal and professional development in 23 out of 24 areas of college effectiveness (MIU Evaluation Office data)
   - Increased ego development among graduates (Alexander, Dixon, Chandler, & Davies, in press)

3. To improve governmental achievements
   - Increased peaceful overtures by the United States government toward the Soviet Union (Gelderloos & Cavanaugh, 1990)

4. To solve the age-old problems of crime and all behavior that brings unhappiness to the family of man
   - Improvements in a composite index reflecting quality of life in the United States (Orme-Johnson & M.C. Dillbeck, 1987)
   - Reduced deaths due to violence in the U.S. (M.C. Dillbeck, in press)
   - Reduced violent and property crimes in the District of Columbia (Bandy & Lanford, 1984)

5. To bring fulfillment to the economic aspirations of individuals and society
   - Comparable or higher salaries among graduates (MIU Evaluation Office data)
• Increased levels of the Dow Jones industrial average (Orme-Johnson & M.C. Dillbeck, 1987)
• Decreases in Okun’s “Misery Index” (combined averages of the national inflation and unemployment rates) (Cavanaugh, 1987; Cavanaugh & King, 1988)

6. To maximize the intelligent use of the environment
• Reduced automobile accidents (M.C. Dillbeck, in press)
• Comparatively higher percentages of alumni who “understand the interaction of man and his environment” (MIU Evaluation Office data)

7. To achieve the spiritual goals of mankind in this generation
• Increased functional integration of the brain* (Orme-Johnson, 1982)
• Increased “intrinsic spirituality,” one of the subscales of psychological health, among MIU students (Gelderloos, 1987)
• Increased inner wakefulness during sleep — a sign of rising higher states of consciousness (Cranson et al., 1989)

*These studies are specifically on the TM-Sidhi course for students at MIU.