independent medical studies:

their potential impact on

the health care system

proceedings

PROCEEDINGS

INDEPENDENT MEDICAL STUDIES:
THEIR POTENTIAL IMPACT ON THE HEALTH CARE SYSTEM

An Invitational Conference Sponsored by

THE PAN AMERICAN HEALTH ORGANIZATION

In Cooperation with

THE OHIO STATE UNIVERSITY COLLEGE OF MEDICINE

and the

ASSOCIATION OF AMERICAN MEDICAL COLLEGES

November 2-4, 1976

TABLE OF CONTENTS

*EDITOR'S NOTE: Dr. Garcia gave a visual presentation at the conference.
A written summary did not adequately convey the critical information con-
tained in his presentation and is, therefore, not included in the proceedings.

P R E F A C E

José Roberto Ferreira, M.D.

The title of this volume highlights a relationship which although quite logical, seldom is realized in the general process of health care delivery.

To analyze the potential impact of independent medical studies on the health care system implies that medicine and health are closely related and -in pragmatic terms- accepts that the training of physicians has to be integrated, not only to the limited area of medical care, but also to the broader scope of the total health care system.

The opening remarks made in the initial pages of this document explain in detail the different views which influenced the orientation of the meeting. Consequently, I would like to make only a few additional observations.

First, the theme suggests a multisectoral approach, bringing together innovations in the educational field, with new alternatives for the delivery of health care. This multidisciplinary approach calls for contributions from educators, physicians, administrators, social scientists, nurses and other health professionals.

The meeting was multinational, which stimulated crossfertilization through exchange of experiences among cultures and levels of development.

Both, the educational technologies (often quite complex in the North American environment), and the South American variations of the community-based approach had their potentials increased in this interchange.

Finally, a very practical aspect emerged as the main focus of the discussions, called by the Spanish-speaking participants "la integración docente-asistencial", literally, however poorly, translated into English as "integration of services and education". Thus, the recognition that total immerse of the learning process in the service environment, not only improved the quality of the physician, but also made him more responsive to the real health needs of the community, was the essence of the meeting.

These proceedings do not discuss a new topic, both the exposure to community medicine and the self-learning, have existed for many years, however the purposed of this publication is to demonstrate the interrelation between the two, and to facilitate greater interaction between education and services.

I am thankful to Dr. Trzebiatowski for sharing the responsibility of organizing this meeting and I congratulate him for his excellent work in editing this document.

To all the participants my wishes for their continuous success in improving the education of health personnel, and my sincere gratitude for their collaboration--without their contribution this effort would have not been possible.

PART I

EDITOR'S INTRODUCTION
By Gregory L. Trzebiatowski, Ph.D.

The need for this conference has grown from several personal
experiences over the last two or three years. The first was the close
observation of the medical curriculum at Ohio State University. I be-
came concerned about the representativeness of the experiences and training
given our medical students. It seemed to me that if our goal in the M.D.
curriculum is to train undifferentiated physicians then the student must
have exposure to the full sprectrum of clinical problems (i.e., primary
care through tertiary care). Appropriate primary care and secondary care
experiences could only be given to the students in community settings in
which they actively participated in the health care delivery of that community.

Second was a series of experiences that centered around my work with
the Pan American Health Organization (PAHO) while I served as a consultant
to help establish the Latin American Center for Educational Technology in
Health (CLATES-Rio). My direct observation of medical schools in Brazil
seemed to indicate that its students lacked the same direct involvement
in the primary care portion of the health care delivery system as ours.

Thirdly, conversations with Dr. Jose Roberto Ferreira, Director of
the Division of Human Resources of PAHO, clearly indidated that this was
a concern to him and a need that he had identified in both North and South
America. It seems that by following the Flexner[1] model, which is based on
the European system of University-based medical education (in the United
States), and the direct adoption of the European system in South America,

---

Flexner, Abraham, Medical Education in the United States and Canada: A
 Report to the Carnegie Foundation for the Advancement of Teaching. New
 New York, NY, 1910.

both North American and South American medical schools are excessively isolated from the health care system. Medical students on both continents suffer as a result of this isolation.

Our successful experiences with the Independent Study methodology led me to believe that this method of instruction could be used successfully to support medical students when they were in a community. The traditional weaknesses in community-based programs which are: a lack of defined curriculum, instructional and educational materials to support the students, and a trained faculty all could be at least partially overcome by the use of the independent study system, particularly if it were combined with a faculty training program.

I, then, conceived the idea for a conference, proposed it to Dr. Ferreira who kindly accepted it, and we began planning more than a year prior to the conference.

At the turn of the century in the United States, physician education was characterized by apprenticeship programs mixed with a high number of low quality proprietary medical schools. The AMA and other influencial organizations were pressing for a European type medical education system. Abraham Flexner was commissioned by the Carnegie Foundation to study the state of medical education in the United States and Canada. His report, which galvanized public opinion, was issued in 1910 and resulted in setting a trend that has continued for sixty-seven years in health professions education with medical education affected first and the other health professions following. This trend followed Flexner's recommendations that medical education be moved into the university so that students could take advantage of the life science departments and be given a strong scientific preparation before their clinical training. He also recommended that clinical training be conducted in an

academic hospital (i.e., a teaching hospital) which is owned or closely associated with the university. As a result of Flexner's report, many proprietary medical schools were closed and the remaining schools became affiliated with universities.

Other health professions have followed the same trend as medical education. Hospital-based nursing diploma programs became university-based baccalaureate oriented programs. This trend continues today. Ohio State University offers baccalaureate degrees to students of medicine, dentistry, pharmacy, optometry, veterinary medicine and fourteen allied health professions.

While a great deal has been gained by moving the health professions education out of the health care delivery system and into a university environment, something has also been lost. The university "ivory tower", as it is typically characterized, lacks a practical orientation and it is very easy to lose touch with reality. A steady barrage of criticism of medical education is leveled by a wide variety of critics who maintain that medical student education was overly scientific and had lost its humanistic orientation. The critics contend that physicians are more interested in how much money they personally accumulate and have little concern for the quality of health care in the nation. Large populations of citizens go unserved because of the poor distribution of physicians and other health care delivery manpower. Extensive pressure is being brought to bear by the United States government to not only increase the output of medical schools but to solve the geographic distribution problem. Many medical schools are concerned with responding to this criticism and are looking for mechanisms to achieve a more balanced curriculum and more balanced experiences for their students without losing the high quality which Flexner so rightly recommended. Little will be gained by sending poorly trained but humanistic physicians to inner

city and rural populations. The best of both worlds must be maintained. Experiences with independent study at Ohio State University and other institutions around the world have accumulated a considerable body of know-ledge on the effectiveness of this instructional methodology. Students can, indeed, learn on a relatively independent basis outside of traditional university frameworks. The purpose of this conference, then, sponsored by the American Association of Medical Colleges, the Pan American Health Organization and The Ohio State University College of Medicine, was as follows:

1) to promote an understanding by the conference participants of the potential benefits of using independent study as a pedagogical methodology for community-based medical education programs.

2) to discuss the issues involved in using independent study in community-based medical projects.

3) to assess the potential impact of community-based medical projects.

4) to assess the potential impact of community-based independent study medical education programs in the health care delivery system.

5) to disseminate the deliberations of the conference to medical education in both North and South America.

The meeting was held in Washington, D.C., November 2-4, 1976, with representatives from the World Bank, the World Health Organization, and the Kellogg Foundation all of whom have contributed a great deal to support of innovative ideas in medical education.

The conference was designed to be really two conferences. Part I was a series of papers which would bring to those individuals at the conference who did not have direct experience in independent study a background of information necessary to discuss its implications for use in the health care delivery system. Major papers were given on the following topics:

1) A Conceptual Framework: The Health Care System in Education

2) A Conceptual Framework: Independent Study Programs

3) Learning Styles and Mastery Learning

4) Evaluation of Independent Study Programs

5) Faculty Role in Independent Study Programs

6) Curriculum Organization and Administration of Independent Study
   Programs

These papers, then, served as a prelude to Part 2 of the conference

which was entitled "Independent Study Programs and Health Care Delivery

Systems". Panels of experts from each of the groups discussed the following

topics:

1) Interrelationship of Education and Health Care Delivery for
   Independent Study Programs

2) Resources and Support Systems for Independent Study Programs

3) Curriculum and Program Administration in Independent Study
   Programs

4) Summary Session - Independent Study Programs, Present State of
   the Art and Its Potential Impact on the Health Care Delivery
   System

As one might expect when intelligent, dedicated individuals meet to

dialogue on a given issue, the proceedings of the conference can be

characterized as lively. Confusions also abounded, partially due to

language differences, and, in large measure, to disciplinary orientations

and misunderstandings of concepts basic to a particular discipline. All

participants were challenged by concepts and ideas brought forward from all

groups.

The impact of the conference cannot be measured at this time. Such conferences as these are really designed to open the participant's awareness and to plant the seed of new ideas, some of which will germinate and grow, become extremely productive, while others will lay dormant for years. As the principal architect of this conference, I personally can attest to the enormous benefits that I achieved from the three days of dialogue.

I must pay a strong tribute to Dr. Jose Roberto Ferreira, Director of the Division of Human Resources Development, Dr. Luis Carlos Lobo, Director of CLATES, Federal University of Rio de Janeiro, Brazil, and Dr. Emanuel Suter, Director, Division of International Medical Education, AAMC, and the Pan American Health Organization who spent many hours planning the conference with me. A final tribute goes to all those participants who gave so freely of their intelligence and dedication to make the conference a successful event so that the benefits of the conference may be spread as wide as possible. If, after reading these proceedings you have any questions, would like any additional information, or simply would like to continue the dialogue, please feel free to write me directly and I will make every effort to provide you with as complete and comprehensive information as possible.

I, alone, will accept full responsibility for the editorial privileges taken in preparing this document, but I would like to express my sincerest gratitude to Mr. Luis Ramirez, M.S., Department of Medical Education, Faculty of Medicine, University of Concepcion, Concepcion, Chile for his assistance in translating and editing the conference proceedings. Finally, I would like to thank my secretary, Sallie Rosenik Mitchell, for her patience and outstanding work throughout this entire effort.

OPENING REMARKS AND CONFERENCE REVIEW
Dr. Hector R. Acuña

I am very happy to welcome you to this seminar on "Independent Medical
Studies: Their Potential Impact on the Health Care System," organized by
the Association of American Medical Colleges, The Ohio State University
and the Pan American Health Organization. This seminar is especially
significant because it includes topics about critical matters related to
the development of human resources for the area of health.

Among others, we hope that the problem of the number of students in
relation to the quality of the instruction will be considered, especially
if we insist on continuing a formal educational system within an orthodox
structure and with the use of traditional educational methods. In contrast
to this formal system, maybe we will find among these new problems new and
modern creative and innovative solutions.

In this constantly changing world, the institutions dealing with training
must propose their own changes and not limit themselves to the acceptance
and adoption of proven solutions which were developed in other times and
under other conditions. It is also necessary to be ready to analyze the
problems without assuming to defend current practices or maintain situations
to which we are accustomed. We need to be mentally prepared to study new
concepts, analyze innovative ideas and face the constantly changing social
process which is a very dynamic process.

If we accept the fact that every individual has the right to access
of an educational system through which he can develop his hereditary potent-
ialities, we must also admit that it is necessary not only to broaden these
opportunities for learning, but also to individualize the educational process,
adjusting it to the particular characteristics of each individual learner.

The student should be recognized as the prime agent of the teaching/learning process, taking into special consideration what the student learns and not just what the teacher teaches.

Independent study, self-instruction and informal education are some of the strategies that we have to use for the education and training of personnel for health programs and these strategies simultaneously accomplish the goals stipulated in PAHO's Ten Year Plan for Health.

Our goals and objectives are not finished with the training of health manpower. We must recognize that the students now in training will be the professionals that will be part of the work forces of the future and that our task includes preparing them to face today's health problems and the ones that will prevail in the future.

Health and education are not privileges of a few and the right of others. Health seminars and the opportunity for learning must be extended to the entire population. We must provide enthusiasm and knowledge so that the governments are able to broaden the area of health services through a system of levels of care of growing complexity, especially oriented to the rural areas and through multidisciplinary teams that give primary care for the maintenance and recovery of health and the control of the environment.

We hope that the independent study programs will allow for the use of the resources of the national system of health care in the training of personnel, thereby extending health care systems. We also hope that they will offer training opportunities for the several components of the health team. Their learning experiences sould prepare them to face the most important health problem in their countries.

With this approach, the Pan American Health Organization has used the materials of the Independent Study Program of The Ohio State University in

CLATES of Rio de Janeiro through an agreement that has allowed CLATES to develop educational material for self-instruction courses in basic sciences which are used by students of several specialties in health.

Many training programs have been developed in which self-instruction has played an outstanding role. I consider the adoption of these strategies to be of great relevance in assuring the training of a larger number of health personnel at all levels, and thus, extend the coverage of health services, maintaining throughout the desired quality.

By accepting and endorsing such views the Association of American Medical Colleges has joined in the organization of this seminar and this action pleases us very much.

Ladies and gentlemen, welcome to our home. It is my hope that these tasks we are about to initiate will be productive and motivating and that all of us may leave here having shared our experiences and be in a better position to understand the integrated concept of health services and of the necessary resources for their development.

Thank you for your contribution to the success of this seminar, the success of which I consider, of course, to be already assured because of the high quality of the participants.

OPENING REMARKS AND CONFERENCE REVIEW
By Dr. Emanuel Suter

Good morning, ladies and gentlemen, Dr. Acuña. It is a great pleasure
for me to welcome you on behalf of the Association of American Medical
Colleges to this conference. As you know, the Association is dedicated
to the promotion of health professions education and especially of medical
education and medical research, and through these two to promote improve-
ments in health services and health care. The expertise of participants
in this conference is interesting since it brings together individuals who
usually do not engage in a dialogue of this type, namely people who are
particularly interested in educational development and those individuals
who are more interested in health services delivery. Maybe there is a risk
in bringing those people together -- they'll either reason together or
they will separate and feel they have no common goals. Maybe one group
is missing today at this conference and that is the students, the object
of our discussions, and maybe in future discussions we will be able to correct
this deficiency because it is their active participation in any individual,
independent study program that makes such programs successful.

Why do we talk about independent study programs? In a way I think that
they offer a response to outside pressures impinging on our educational
institutions. They are responses to modern technical developments and they
are responses possibly to a dilemna in which we find ourselves today in
academic medical centers. Some of the challenges have been mentioned by
Dr. Acuna already, namely the large number of students that are hammering
at the doors of our medical schools, the rejection of traditional educational
methods which we were all accustomed to and which we have adhered to, the
developments in our knowledge of the learning process, the role of teaching

in the process of learning, and particularly the development of new techno-
logies that make resources available to our learners that were not present
earlier. Finally, a note of recognition that medical education and medical
schools have to relate much more closely to the health care needs of their
region of the country - and a new look at the way a physician continues his
education over his or her whole lifespan.

Independent study programs offer unique opportunities but they also
involve some hazards and risks. If we look at the continuym of medical
study, that is from the beginning of the decision of an individual to be-
come a physician and the end of his or her career as a doctor, we have
some difficulties or some hurdles to overcome to introduce the concept of
life-long study. And, in order to develop this behavior in the early phases
of medical education, we must develop a few essentials -- learn to utilize
and live with a few essentials that are necessary; namely, we have to
assess the performance of the physician, identify more clearly educational
objectives or the learning objectives, introduce the concept of independent
and self study, and, finally, we need the methodologies to evaluate what the
organization and what the students are doing. This we must do for all three
recognized phases of medical education, namely, undergraduate medical edu-
cation, graduate education, and continuing education of the physician.
Finally, this has to be related to health care objectives.

Now, what are some of the requirements that we have to be concerned with
and what are the difficulties? First of all, we need only the key element in
any development - the faculty. Without their interest and without their
dedication and willingness to accept the newer methodologies and new con-
cepts we cannot even get started. Developing their interest and dedication
might take considerable time. Each of us within our settings need to develop

more clearly defined and clearly stated objectives. In order to facilitate
the development of comprehensive educational objectives, we need to develop
new means of rules to measuring physician competence and physician perfor-
mance because ultimately it is not exclusively the cognitive knowledge
which we acquire as physicians, but really it is the patient care outcome
that counts in the long run. We have to develop the necessary teaching and
learning resources to support our educational programs, some of which may
be very simple - paper and pencil style and others may be highly sophisticated
and involve computer assisted education and telecommunication networks.

We need to carefully consider the organization of our educational pro-
grams because independent study programs depend on better correlation and
better organization. The initial development of independent study programs
is obviously expensive but the opportunities and the stakes are high and
at the moment we are just at the beginning. It will require an enormous
amount of energy, of innovation, and initiative from our faculties and from
those who provide the funds for medical education to develop successful
independent study programs. The Association, for instance, is particularly
interested in two aspects of independent study. First is the training
or the continuing education of the faculty in their role as educators. It is
also interested in the development of educational resources that may pro-
vide a basis for independent study programs, and it is interested, of course,
in the faring or experience among medical students in the United States and
abroad.

I, personally, hope that this conference will be a stimulus to all of
you and us, that it will also provide some guidelines which we can use when
we go back to our offices, laboratories or students. In particular, the
Association is very grateful to the Pan American Health Organization for having
organized the conference. Thank you very much.

OPENING REMARKS AND CONFERENCE REVIEW
### By Dr. Gregory L. Trzebiatowski

Thank you very much. It is a pleasure to be a part of this conference.
On behalf of the president of Ohio State University, Dr. Harold Enarson,
and Dr. Henry G. Cramblett, Acting Vice President for Medical Affairs and
Dean of the College of Medicine, I bring you best wishes for the success
of the conference. Both of these men would have liked to have been here
with us but their schedules did not permit. Dr. Enarson, the president of
Ohio State University, is particularly interested in international work and
international cooperation so I know that on behalf of Ohio State, I'm in a
very good solid position. On a personal basis I am particularly pleased to
be here. This is a bicentennial year for the United States, being here in
the capital city on a national election day and being part of an international
conference touches me as an individual.

One might wonder whether or not conferences like this make any difference
and whether or not you really ever make any progress, or whether it's worth
the time it takes to meet together and to talk, think, and to share ideas.
It's interesting that smallpox is being eradicated in the world under the
leadership of WHO. The North and South American continents were declared
free of smallpox in 1973 and I'm sure a great many conferences went on to
eliminate this scourge which has killed so many tens of thousands of people
over the decades and over the centuries. History shows that man can pro-
gress but is also reminds me of a report that I read in a book on the history
of American medicine about Cotton Mather. Cotton Mather was an American
clergyman who lived from 1675 to 1750. As a clergyman he was a very curious
individual who did a great deal of reading in medicine. He is credited with
starting the field of preventive medicine in the United States or at least

in the colonies which are now known as the United States. One of the things
that Mather was very interested in was smallpox. During his extensive
reading he discovered that in the Orient, Circa 1723, inoculation was being
practiced and that in Turkey inoculations were also being used regularly.
He learned from his Negro slave who was his houseboy that this particular
slave had been inoculated. He asked his houseboy, "Have you ever had small-
pox?" and the fellow said, "Well, both yes and no; I had a light case of it
and so I've had it, but then again I haven't had it because I'm alive and
I don't have any of the usual psychological and physical scarring left by
that great scourge. "

It took Mather five years to get the Boston physicians to even consider
doing inoculations since in London and in England the climate was very anti-
inoculation. They really felt that there was nothing they could do about
smallpox in one medical culture of the time. Yet, in other cultures this
problem had at least been partially solved.

What this incident tells me is that we can gather ideas in many,
many places and we can all benefit from the exchange. The ability of the
human mind to delude itself constantly amazes me -- that people can say that
I have the right way, I know my way is right, therefore, it must be. So it is
with medical education. Many challenges have been alluded to -- the number of
students, the rapid impact of change on the health care system. Because
Dr. Acuna and Dr. Suter identified the key challenges, I won't restate them,
but I would like to say that we have a methodology in independent study (IS)
that we need to explore together, not because Ohio State has many years of
experience with IS - - we know there are problems in it and there are many
issues to be resolved. These issues come to the forefront, in particular,
when we talk about taking independent study programs and medical students
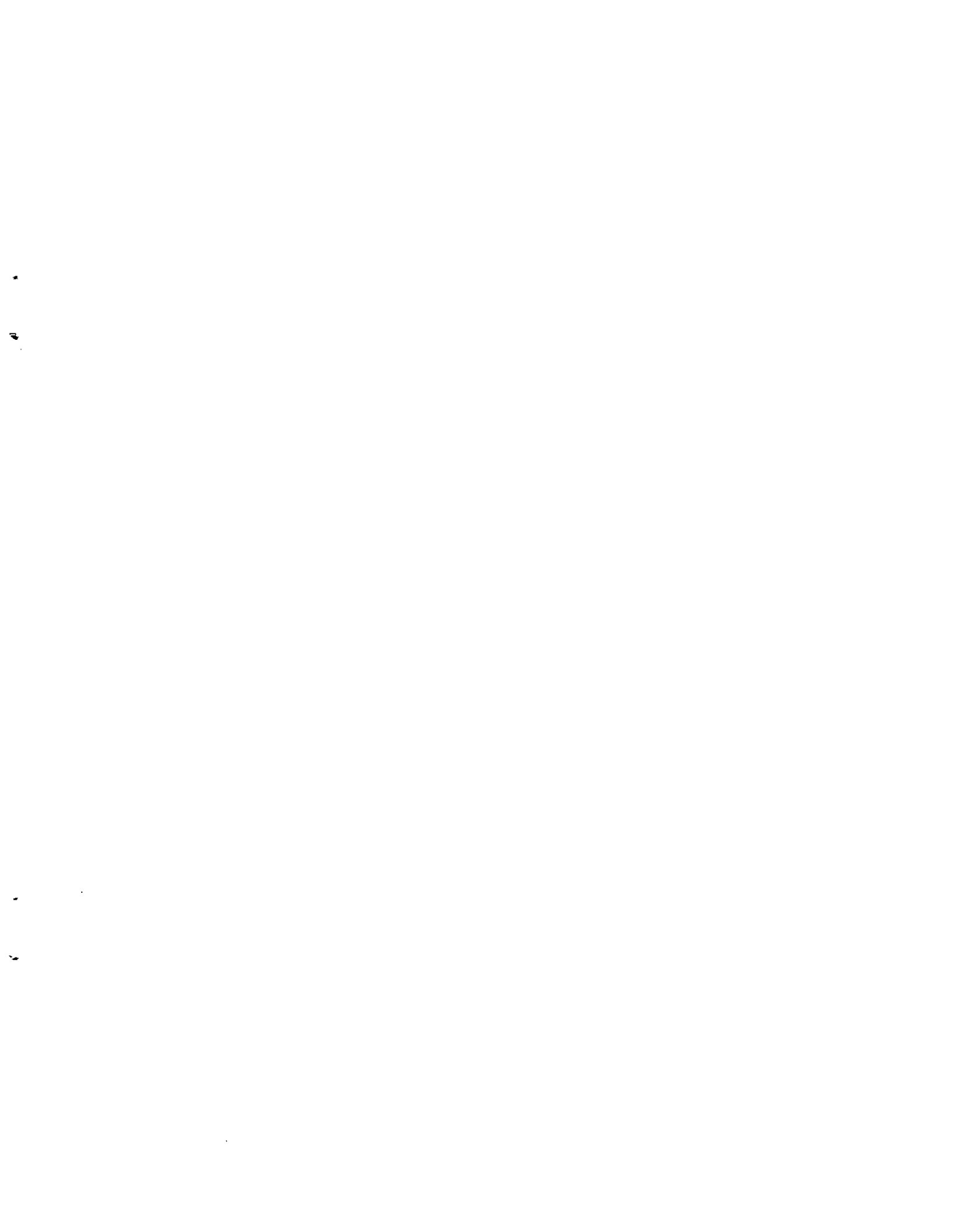
concern is taking care of patients. I think their second concern is to

train their own kind, that is residents in endocrinology, cardiovascular

surgery, etc., etc. Their third major interest in our teaching hospital

is to do research, to come up with new drugs, new treatment procedures,

new operational procedures that will improve and extend our tertiary care

ability. In fourth place is the training of medical students. It took me

a while as the chief academic officer of the College of Medicine to adjust

to this idea and I resolved that even though teaching was fourth in priority

in a teaching hospital, it did not mean that it had to be badly done.

Actually, I think it is quite well done. However, our students, from a

curricular standpoint, are short changed. If you define a pre-MD education

as a broad preparatory experience, then to have the training done exclusively

at the tertiary care level is inappropriate because there is a good deal of

basic medical knowledge that can only be found at the primary care level or

in community hospitals and in community clinics. So the need to take programs

back into the community is very great, but the problems are also great. All

we need to do is reread Flexner's report which talked about the lack of a

curriculum, the lack of any kind of structured organization, educational

resources, textbooks, evaluation procedures, and trained faculty. We can see

what's ahead of us if we don't proceed carefully.

The second goal of the conference is to discuss the issues involved in

using independent study in community-based projects. I think there are clear

issues around the question "what to teach, i.e., curricular issues."

When is the best time; when is the most appropriate time to take a student

into the community? Should it be at the very beginning, as Michigan State

has done with their upper Peninsula Project, where students spend practially

their entire medical education in a community-based clinic? Should it be near

the end of their training just before graduation as we're doing at Ohio
State and many other schools?

There are many issues as already alludêd to around evaluation. It has
been my experience that community practitioners who receive students are so
delighted to have a student with them that any student, even the worst
student that we have, comes back with very, very high ratings - ("This
boy or young lady is fantastic! He has excellent scientific background,
relates well to patients, etc.") The reports are glowing and yet I know
by looking at that student's previous academic record that it simply cannot
be true. Every student we send out is not a superstar. Now how can we develop
an evaluation system, not only on the academic and the scientific factors,
but on those other intangible factors that make a physician's success so
important? Perhaps we can use technology. We have many, many technologies
at Ohio State. My institution probably has gone as far with technology as
any other school. We have extremely sophisticated television systems; we have
a medical microwave television system into the Appalachian area of Ohio,
which is really one of the poor areas of this country; and we have several
types of computers to aid us. We also have technologies in terms of curri-
culum, instructional and evaluation technologies which are not hardware
oriented and which are not expensive to develop.

The fourth major issue that I'd like to address is faculty development.
I dislike that term because I think it has a derogatory kind of flavor to
it. It's very popular here in the States to talk about faculty development
as if they were underdeveloped and those of us in education who have the
"word" will raise these individuals to a fully developed level. I prefer
faculty renewal or some other less insulting term. But, in the case of
community physicians I think the term is probably correct -- that most of

these individuals who are heavily involved in practice since they
left their training programs and suddenly find students on their doorsteps,
need to understand and need to be given some training in what it's like to
be a mentor or a preceptor. I don't think it happens automatically. I
think we'll run into the same kinds of problems that Flexner warned us
against if we do not have some very serious well-developed, well-worked
out faculty training programs.

The next goal of the conference is to assess the impact of community-
based independent study medical education programs on health care delivery
systems. What does it mean when you take a student or students into the
community? What does this do to the dynamics of the delivery system? What
does it mean in terms of the health care team when you insert the medical
students somewhere in the hierarchy? It's pretty well established in a
teaching hospital or in a community hospital that regularly has medical stu-
dents; but, when you take a student out into the clinic in a small city,
can we really begin to train teams, working teams? I hope we can. There's
a very strong prejudice, and I'll only speak for my institution, against
training health care as a team. The pressure is to keep the physician
separate, independent, above all those one hundred different types of
health professionals that we have. But can we create a truly functional
team and fit the medical student into it? I'm afraid that if we don't train
the physician to be a part of the health care team, someone else is going to
become the team leader and the physician will become a highly paid --
well, maybe not even highly paid -- technical specialist.

Our final goal is to disseminate the deliberations of this conference
to those who could not attend this conference. I hope it begins the basis
for dialogue that will carry on. Think of these three days as an opportunity

for self-renewal, and faculty development. I see these three days as a
chance for me to get away from my desk, telephone and all the other demands
that I have on my time and to sit, think and talk together with each of you.
I hope that each of you will feel free to talk between each other on a very
personal kind of basis. That's my hope -- that each of you will speak out
when you have a question, when you disagree, and when you agree. In that
way I think we can come to a better understanding of what independent study
is all about and what potential it has for improving the health care delivery
system.

Thank you.

INTRODUCTION TO PAPER BY DR. MANILLA

Dr. Manilla prepared an excellent paper which provided the conceptual framework for the members of the conference relative to their understanding of independent medical studies. He begins by stressing the importance of defining the concept, independent studies. A clear definition of the attributes of independent study must be outlined if there attributes are to be designed into teaching programs. He raises such important questions as, "From what constnaints are independent study programs seeking independence? What attributes must independent study programs have in order to be considered independent study?" He opens his discussion of independent study by examining the teaching/learning environment of most medical schools and finds from a historical perspective most schools have been the agents of the preservation of values and the interests of special groups and that teaching and learning in the bureaucracy of education is designed not on the basis of scientific research but on a bureaucracy in which the teacher controls both the positive and negative reinforcers for learning in order to foster the development of legitimate learner behaviors as defined by the group which is imposing its values on the educational system. Independent study, on the other hand, would imply the development of a capacity to continue studying without the imposition of an external authority figure enforcing learning. It is also a process that permits the student to determine by himself what he is going to learn within the parameters defined by the school, the velocity of his learning, the method of learning, and the types of learning resources utilized in order to accomplish the objectives and gain mastery of the subject's content.

Dr. Manilla goes on to raise some questions about criteria for evaluating independent study programs. He maintains that it depends on the purpose of the program. If the purpose is to provide a wider variety of curricular alternatives, then it is evident that the criteria must be efficiency. If, on the other hand, the expected outcome is an independence in professional behavior of the graduate then the criterion will be the number of students that at the time of graduation have developed that capacity and furthermore, the number of students that will retain the capacity for a long period. He goes on to discuss the importance of professional schools training a student who can continue to learn throughout his professional career then develop a set of criteria whereby independent study programs could be judged whether or not it, in fact, does develop students who have these abilities. His most interesting statement is that, "The capacity for studying independently is a capacity which can be developed by all students and will depend to a great extent on the reinforcement that the student gets from the educational system as a whole and from the teacher in particular."

INDEPENDENT MEDICAL STUDIES: A CONCEPTUAL FRAMEWORK
By Dr. Jose Manuel Alvarez Manilla

Very frequently, in the field of education, a set of teaching methods which are sometimes dissimilar are gathered under an undefined concept. This is the case with concepts such as open univerity, independent study, non-traditional teaching, etc.   However, nothing of value can be attributed to them until we conceptualize them clearly and their characteristics are sharply defined.

With respect to the concept "independent study" we assume that there is a need to give the concept a meaning in order to design teaching programs that share certain attributes.   The important questions are: "From what constraints are these programs seeking independence?   What attributes must a program have in order to be considered independent study?"

It is evident that humans can learn without the need of being taught. Most human learning is carried out in an informal way, i.e., without the intervention of a mediating bureaucracy.   However, the learning of a profession has become highly formalized and, in fact, it is almost impossible to conceive of it not being carried out by a bureaucracy which orders it, sanctions it and "certifies" it.   Therefore, the learning of the professions has become highly dependent on a bureaucracy.

Learning is an individual process.   The opposite of learning is teaching which consists of facilitating or accelerating the learning process.   Teaching implies a social process and a technical relationship.   Education is a social process with a dominant ideological factor, through which is defined the

---

*Translated by Luis Ramirez, M.S.
**Edited by Gregory L. Trzebiatowski, Ph.D.

legitimacy or illegitimacy of the orientation. Content and practices of teaching are related to the dominant values of a given social group. For a long historical period, the school has been the agent of preservation of the values and interests of the professional groups. In 1906 Thorndike stated that "The efficiency of any profession depends to a great extent, on the scientific degree that it is able to reach. The teaching profession will improve: a) in the proportion in which its members direct their daily work according to the spirit of the scientific method; that is to say, through an honest consideration of the facts with an open mind, free of superstition, fantasy or unverified beliefs, and b) if its leaders direct their selection of methods through the result of the investigation and not according to the generalized opinion."[1]

Nothing could be more opposed to Thorndike's statement then the current methods of teaching found in the majority of the schools of medicine and other types of schools as well. The dominant psychological theory used in schools is the sensual-empiricist which postulates that learning consists in "provoking impressions in the spirit" and "it is limited to presenting the objects and operations through demonstrations carried out in class". This psychological school also believes that only the teacher can carry out these operations effectively, or in lucky cases, by a student called to the blackboard. This school of thought sanctions an educational system which conceives learning as a charitable act given to a learner by an agent of the bureaucracy - the teacher who has under his control both positive and negative reinforcers of learning in order to foster the development of "legitimate" learner behaviors as defined by the group which imposes its values on the educational system. The social relationship created between the student

and the teacher can be defined as domination-dependence. This relationship

remains throughout the years of academic training. This situation conditions

the student into dependence towards external authority figures to which the

process of acquisition of knowledge and continuing education remains linked

through their entire professional life. In the final analysis it is the

evaluation system that determines the student's dependence upon the teacher

since evaluation methods and instruments deal with what the school or the

teacher consider to be of value and disregard that which is not important

for the school or for the teacher even if it is important for the student.

Thus, it is important to define independent study as it is postulated

by Dressel and Thompson "more a goal than a process"[3] which would imply the

development of a capacity to continue studying without the imposition of an

external authority figure enforcing independent study. It is also a pro-

cess that "permits the student to determine by himself what he is going to

learn" (within the parameters defined by the school), the velocity of his

learning the method of studying and the types of learning resources utilized

in order to accomplish the objectives and gain mastery of the subject's con-

tent. Its purpose is the self-guidance for learning in a continuous way

during his entire life.[4]

It is possible to find some contradictions in the process of making

the program operational even if these purposes are not objectionable. An

analysis of current independent study programs has shown that they all give

the student the opportumity to participate in an independent study program

as long as it gives the student the chance to accomplish the objectives

stated by the school. Most of the programs are not intended to be useful

to all students. In some programs the students are selected according to

the experience and competence with independent study as shown in preceding

years. The most capable and experienced students are selected which reinforces the idea that students are not going to develop a capacity for independent study during the program because they already have the capacity for independent study. Under these conditions the only benefit to the student will be an increase in his knowledge of the subject matter. Other programs allow the students to choose between a traditional program and an independent study program. In these schools it is assumed that not all the students can or must develop an independent study capacity. With most of the programs it is assumed that independent study program development and operation require more human resources, instructional materials and learning resources (computer, TV and other audiovisual media) and specific teaching materials especially designed for such a purpose.

A concept that tends to get mixed in the independent study literature is structured or unstructured curriculum. With some programs it is assumed that the independence in the study is going to be achieved based on an unstructured curriculum which must be structured personally by each student from the objectives outlined by the school for each phase or term of study. Their programs follow the learning principles which postulate that each student learns in a particular way at a different speed.

What, then, are the criteria which determines the goodness of an independent study program? It depends on the purposes of the program.

If the program's only intention is to provide a wider variety of curriculum alternatives, then it is evident that the criterion must be efficiency since that is what is expected when diversified curriculum alternatives are offered in order to meet the individual characteristics of each student. It is assumed that if the student controls the velocity and the method of learning his efficiency will improve. If, on the other hand,

the expected outcome is an independence in the professional behavior of
the graduate, then the criterion will be the number of students that, at
the time of graduation, have developed that capacity, and, furthermore,
the number of students that will retain that capacity for a long period.

It is important to insist on a clear definition of independent study.
In my opinion an individual that has acquired the capacity for independent
study will have the ability to reach information pertinent to the solution
of the problems which he encounters in his work and will have the ability
to maintain the minimum level of information that assures his competence in
the professional field he has chosen. This capacity implies the capacity
of distinguishing pertinent information from the nonpertinent and the
ability to search published literature for needed information.

With independent study defined in such a manner, some questions need to
be answered: Is this a capacity that must be acquired by all professionals?
Does the traditional program exclude the learning of the capacity for
independent study?

One of the objectives of most professional schools is to train students
to continue learning throughout their professional careers. The fact,
supposedly, is that this goal is not accomplished and the didactic methods
used in professional schools to accomplish this and other similar goals in
actuality reinforces the educational establishment as a whole (i.e., the
dependence towards the teacher or his substitutes for the learning). If
the acquisition of the capacity for independent study is a legitimate
objective in professional education, then the educational system should try
to develop it in all students. The doubt that arises is that all students
may not be able to develop the capacity to learn independently. In this
respect it is important to determine if the student's difficulty lies

in the process of structuring a learning situation for himself, or if this capacity can be developed through a prestructured program.

If we adopt the proposed definition the development of the capacity for independent study would be based on:

1) the development of appropriate habits of reading (appropriate being the acquisition of information and meaning from the written word and not just the interpretation of the characters).

2) the learning of the strategies for searching published literature.

3) the development of the capacity to formulate and define problems in such a way that they guide the search of the literature.

Habitual behavior is set by the repetition of a pattern of behaviors on several occasions and by the reinforcement that is received. An independent study program should formally include opportunities for the student so he can:

1) formulate and define realistic problems related to his professional work;

2) have access to information provided through published and organizational sources; and

3) be reinforced throughout the process, that is to say, that the educational system does not stand against the development of these behaviors.

In conclusion, the source of dependence of the student and the dependence of the future professional is not the program of studies itself, but the role of the teacher and his instruments of control (examinations, grades, etc.). Independence in studying can exist only to the extent that the student is able to formulate and define his own problems, and to the extent the student has access to and mastery of the information system. When we consider

that students have gone through an educational system which has left them

a heritage of dependence on external authority figures for their information

and that the educational system up to and including the professional level

tends to repeat and reinforce such a situation, we can understand why

many students feel unable or afraid to go into any program that differs from

the traditional one. Even if they are willing to try all this, of course,

not every school will allow them to register if their school background is

not appropriate. It is not appropriate to compare "independent study" with

useful resources for the independent study (audiovisual learning resources,

computers, etc.) and the fundamental resources of a program of independent

study which is the access that the students must have to the library and

the document services. What is important to the program is the time in which

the student can formulate, define and work with the problems that turn out

to be interesting and motivating to him. The capacity for studying indepen-

dently is potentially a capacity which can be developed by all students and

will depend to a great extent on the reinforcement that the student gets

from the educational system as a whole and from the teacher in particular.*

---

*Note: Discussion and clarification of Dr. Manilla's paper was not held
because of the limitations of time. Conferees' questions were
discussed during later sessions, especially during the panel
discussion of the conference.

REFERENCES

1. Thorndike,

2. Aebli, H.: Una Didactica Fundada en la Psicologia de Jean Piaget
Editorial Kapelusz S. A. Argentina. 1973, p.4.

3. Dressel P. & Thompson M.: Independent Study. Jossey-Bass Publishers,
U.S.A., 1973. p. 1.

4. Trzebiatowski, G.: Independent Study Programs in Medical Education:
      The State of the Art. Paper presented at Macy Conference.
      Aspen, Colorado, September, 1975. p. 2.

INTRODUCTION TO PAPER BY DR. LOBO

In Dr. Lobo's background information paper entitled "Mastery Learning, Learning Styles and Self-Instruction" he made a number of important points which contributed greatly to the conference and, indeed, to our understanding of the process of medical education. He begins his paper by contrasting traditional teacher oriented education systems with a student/reality oriented educational program which is meaningful in the context of the real world. He points out quite correctly that learning is an individual and active process in which the student should be considered both the agent and the object of the learning process. Individualization of instruction is, therefore, in keeping with modern educational trends and current learning theory and with the needs, desire and style of the modern learner.

He goes on to emphasize the great importance of mastery learning. He points out the factors which increase the efficiency and effectiveness of learning through a master based educational system.

After exploring various aspects of mastery learning and its importance in a modern medical education program, he moves on into a review of the research on learning styles and the importance of the inclusion of consideration of student's learning style preferences in the design of a medical education system. He also reports on one of his own research studies in which he explores personality dimensions and their interaction with learning styles. This section is particularly valuable in that it calls our attention to the fact that learning is a highly complex and individualized process.

This paper continues with the importance of self-instruction and the steps which are necessary for the development of self-instructional courses.

Research results at the Federal University of Rio de Janeiro are reported. Dr. Lobo goes on to explain the importance of formative evaluation in the development of independent study programs. He explains the theory behind formative evaluation and its role in guiding students towards their goal as well as the result of the research conducted at NUTES/CLATES.

In his final section on self-instruction and integration between the education and health care system, he points out the weaknesses of a university hospital oriented tertiary care clinical education for medical students and the importance of taking students into the health care system so that they can experience and indeed benefit from the opportunities presented by working and studying in this environment. Self-instructional programs can play an important part in supporting students while they are undergoing training and participating in a productive manner in the health care delivery system.

MASTERY LEARNING, LEARNING STYLES AND SELF-INSTRUCTION
By Luiz Carlos Lobo

Traditionally, when we discuss learning we tend to associate this process with formal education where teachers lecture in a classroom environment with students passively sitting, listening and taking notes. Whenever the teaching learning process is discussed, emphasis is usually put on the teacher's role which is considered the main factor in producing effective learning.

Teachers rule our students' lives, defining what should be learned - how, when and where. Students should be attentive and accept what the teacher says as the absolute truth. Learners' mistakes which are a natural part of the learning process are punished by an evaluation system which is often subjective and of doubtful validity.

As Kolb, Rubin, and McIntryre[1] stressed, the traditional classroom symbolizes the assumption that learning is a special activity cut off from the real world and is unrelated to one's life. Conversely, meaningful teaching should be oriented towards the fulfillment of students' expectations and goals while preparing them for productive work and intelligent use of their leisure time.

When planning an educational program we must first determine the career goals of each student, analyze the tasks and functions required for success in each of these careers and then design an instructional program which will give the students the knowledge, attitudes and skill needed to perform the career and functions. By doing this, we assure the relevance of the educational program and increase the students' motivation to learn. Once we know students' expectations and society's needs, we may make them compatible, define the necessary educational objectives and identify the appropriate instructional strategies.

Learning is an individualized and active process, and, therefore, the student should be considered both the agent and the object of the learning process. Each student learns in accordance with his own characteristics such as interest toward the subject matter, previous knowledge, learning style, aptitude, self-confidence, perseverance, and availability of both time and instructional resources. The need to individualize instruction and, at the same time, to increase the efficiency of the teaching/learning process, explains the emphasis on the development of self-teaching study programs, thereby transforming the students' role from a passive to an active one. The student will be the active agent in the learning process, and the teacher will act more as a guide or manager than as a source of information.

On the other hand, active participation by the learner in the learning process is essential if one wishes to individualize instruction, and ensure continuity of the educational process. In fact, it seems to be very difficult for a student who has learned passively while in school, to change his attitude toward learning after graduation and aggressively seek, evaluate, and synthesize information on his own.

Individualization of the educational process can be defined as an attempt to adapt the learning process to each student's characteristics and educational needs (flexibility in learning time, content of the curricula, and utilization of learning resources). This will depend on the definition of clear educational objectives which will help the students' choice of the learning activities offered by the different courses. Diversified and available learning resources are thus necessary, as well as orientation and guidance by teachers who have been trained in modern pedagogic techniques.

Carroll introduced in 1963[2] the concept of "learning for mastery" when

he conceived school learning as consisting of a series of learning tasks

and defined aptitude as the amount of time required by each learner to

attain mastery of these learning tasks. Thus, the time spent on learning

(or aptitude) is determined by: 1) the student's perseverance (time he is

willing to spend in order to learn a task), 2) the quality of instruction

(defined as the degree to which the instruction design approaches the optimum

for each learner), 3) the student's ability to understand the instruction

(which varies with different learning experiences, with student's previous

knowledge on related subjects, and according to Carroll, with his general

intelligence), and finally, 4) with the time available for learning, or

learning opportunity. Thus, the full Carroll model can be summarized as

follows:[3]

Degree of learning = f[(learning opportunity X perserverance) ÷

(aptitude X quality of instruction X

ability to understand instruction)]

Carroll's conceptual model was elaborated by Bloom[4] who proposed that

since the student's aptitude for learning some subject-matter is normally

distributed, if all the students receive the same instruction, vis-a-vis

quantity and quality of instruction, and time available for learning the

end results will be also normally distributed. Thus, instead of fixing

the time available to interact with the subject matter and offering the same

instruction (which will produce different learning outcomes as related with

different students' aptitudes), Bloom proposes to fix the expected learning

results making the other factors (kind and quality of instruction and learning

opportunity) variable according to the characteristics and needs of each

student.

Therefore, both Carroll and Bloom proposed that aptitudes are predictive of rate of learning rather than the level of learning that is possible. Bloom also emphasized the need to present well formulated instructional objectives to be met by the students, to provide instructional opportunities and a variety of alternative ways to interact with the subject matter, to provide feedback information that will guide and correct the students' learning, and, finally, to offer flexibility of learning time. Meeting these conditions, Bloom states that theoretically all students can conceivably attain mastery of a learning task. Low aptitude students are limited in the number of tasks they can learn when compared with average and above average students. Therefore, it is incumbent upon the teacher to identify core content or critical objectives and to specify the order in which learning tasks are to be mastered.

LEARNING STYLES

Educators have long recognized that students learn more and have a much more positive attitude toward the subject if they interact with subject matter following their own learning styles.

Since the learning process is influenced by individual needs and goals, learning styles become highly individualized in both direction and process.

Kolb, Rubin and McIntyre[1] developed a learning style inventory designed to help students identify their own learning style. Four learning modes were recognized: concrete-experience, reflective-observation, abstract-conceptualization, and active-experimentation. The inventory was designed to assess the relative importance of each of these modes for each student. They proposed that each learning mode represented one of the four stages of the learning process as shown in Figure 1.

concrete experiences

testing implications of
concepts in new situations

observation and
reflections

formation of abstract
concepts and generalizations
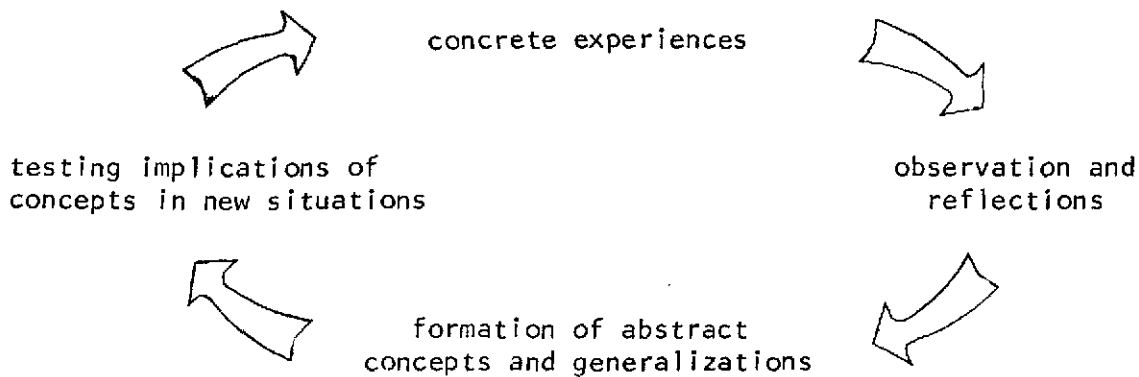
FIGURE 1

The authors tested 127 practicing managers and 512 Harvard and MIT graduate students in management. They observed that scores were obtained in the following order: abstract conceptualization, active experimentation, concrete experience and reflective observation. So, a manager may be primarily concerned with active application of concepts, whereas, a biologist may develop his observational skills highly. In reality they stress that no individual mode is better than the other. The key to effective learning, they say, is being competent in each mode when it is appropriate.

More recently, Rezler and French[5] studied the learning preferences of students in the six Schools of Associated Medical Sciences (Medical Art, Medical Dietetics, Medical Laboratory Sciences, Medical Record Administration, Occupational Therapy and Physical Therapy) comparing them with personality type and academic achievement of the students.

The learning preference inventory was developed following six dimensions:

- Abstract: preference for learning theories, principles and concepts, and generating hypothesis.

- <u>Concrete</u>:　preference for learning specific and practical tasks, tasks emphasizing skills.

- <u>Individual</u>:　preference for learning alone and using materials such as books, and audio-visuals.

- <u>Interpersonal</u>: preference for learning in group.

- <u>Student-Structured</u>: preference for self-instructional tasks with emphasis in autonomy and self-direction.

- <u>Teacher-Structured</u>:　preference for learning in a teacher directed situation.

Rezler and French used the Myers-Briggs type indicator to identify students' personality types[6] (this inventory measures the following characteristics: extroversion-introversion, sensing-intuition, thinking-feeling and judging -perceiving). The results obtained showed higher mean-scores for the concrete and teacher-structured scales for the six allied health professions as compared to the other scales.

The personality type study showed that the introvert, practical, fact-oriented student was particularly attracted to the Medical Laboratory Sciences Course (43% of the students in this course were introvert-sensing-thinking-feeling or introvert-sensing-feeling-judging).

Students of occupational therapy are generally more extroverted, imaginative, emotional, spontaneous and flexible than students from other courses. On the other hand the medical dietetics and physical therapy students showed also that they are more extrovert; all of them have necessarily more contact with patients. Students from all allied health professions courses showed higher scores on feeling than in thinking. Judging scores when compared to perception were higher in students from all courses except occupational therapy.

On the other hand, Goldberg[7] did not find significant interaction between student personality characteristics and course format (structured versus unstructured courses).

A research study was undertaken at the Health Sciences Center of the Federal University of Rio de Janeiro[8], in order to study the learning styles and the personality types of students enrolled in the 4th semester of the courses of Medicine, Dentistry, Nursing and Nutrition.

Out of a universe of 510 students 65 were randomly selected from which 12 were males and 53 females, as presented in Table 1. The mean age of the students of all courses was 21 years, with the exception of students of Dentistry which had an average of 23 years.

The Rezler and French Learning Preferences Inventory[5] was translated and adapted to Portuguese and validated through its experimental application to all students enrolled in the 6th semester of Medicine (four) and Nutrition (seven). It was given to 4 psychologists, 2 educators and 1 nurse. The goal of this application was to gather data on the content validity of the instrument.

The Learning Preferences Inventory was tested statistically and showed an inverse dependence between teacher X student structured learning and between individual X interpersonal or group learning. Abstract had no significant correlation with the concrete dimension although this dimension (concrete) was correlated with the individual dimension.

The factor analysis of the data showed on the first axis; opposition of the individual X interpersonal and concrete dimensions; the 2nd axis opposed teacher structure X student structured learning. The abstract dimension did not account for any effect on the data.

The result obtained is presented in Table II. Students from all 4 courses showed a statistically significant higher mean in the "concrete" dimension, as compared to "abstract". Students of Dentistry showed also a statistically significant higher average in the "interpersonal" dimension, as compared to

STUDENTS OF THE 4TH SEMESTER OF

HEALTH SCIENCES COURSES AT THE FEDERAL

UNIVERSITY OF RIO DE JANEIRO

COURSE	MALES			FEMALES			TOTAL		
	E	T	%	E	T	%	E	T	%
MEDICINE	189	10	5.3	144	12	8.3	333	22	6.61
DENTISTRY	27	2	7.4	35	7	20.0	62	9	14.52
NURSING	5	-	-	67	22	32.8	72	22	30.56
NUTRITION	1	-	-	42	12	28.6	43	12	27.91
TOTAL	222	12	5.4	288	53	18.4	510	65	12.75

E = STUDENTS ENROLLED IN 4th SEMESTER

T = STUDENTS TESTED

TABLE I

LEARNING PREFERENCES INVENTORY RESULTS

OF HEALTH SCIENCES COURSES STUDENTS (8)

DIMENSION / COURSE		ABSTRACT	CONCRETE	INTER-PERSONAL	INDIVIDUAL	TEACHER STRUCTURED	STUDENT STRUCTURED
MEDICINE (N = 22)	$\overline{X}$	46.4	57.6*	50.2	52.5	54.8	53.5
	S	13.3	14.5	15.4	15.7	15.0	9.8
DENTISTRY (N = 9)	$\overline{X}$	42.8	66.3*	60.4**	40.2	58.0	47.3
	σ	8.8	11.7	10.0	9.8	13.5	11.6
NURSING (N = 22)	$\overline{X}$	46.4	56.2*	55.6	51.2	51.8	53.8
	σ	7.3	9.6	12.4	13.1	7.4	7.6
NUTRITION (N = 22)	$\overline{X}$	43.3	66.9*	52.2	52.0	50.2	50.5
	σ	7.3	13.9	8.9	14.7	11.3	10.8

$\overline{X}$ = AVERAGE

= STANDARD DEVIATION

* = STATISTICAL SIGN WHEN COMPARED TO ABSTRACT

** = STATISTICAL SIGN WHEN COMPARED TO INDIVIDUAL

TABLE II

"individual". The other differences observed in Table II were not statistically significant.

Table III shows the percentage of students with high scores in the learning preference inventory scales. It is worthwhile to note that although students from all courses showed a preference towards concrete learning the higher percentage in the abstract dimension corresponds to medical students (the lower percentage was obtained with students of nutrition). We should point out also the comparatively small percentage of students of dentistry with high scores on the "individual" scale of the test and in the student-structured dimension. Thus, it seems that students of odontology prefer to devote their attention to concrete tasks assigned by the teacher to a group.

The Comrey Personality Type Test[9] was also used because this instrument was already translated to Portuguese and validated through its administration to 689 Brazilian University students[10].

This test measures eight personality dimensions along the following scales:

- Trust X Defensiveness

- Orderliness X Lack of Compulsion

- Social Conformity X Rebelliousness

- Activity X Lack of Energy

- Emotional Stability X Neuroticism

- Extroversion X Introversion

- Masculinity X Femininity

- Empathy X Egocentrism

Besides these scales, the Comrey Test has two additional scales, one for the control of validity and the other for the control of biased answers.

PERCENT OF HIGH SCORING ON THE

LEARNING PREFERENCES INVENTORY SCALES (8)

DIMENSION COURSE	ABSTRACT	CONCRETE	INTER-PERSONAL	INDIVIDUAL	TEACHER STRUCTURED	STUDENT STRUCTURED
MEDICINE	45.5	63.6	45.5	54.6	68.2	45.5
DENTISTRY	22.2	88.9	66.7	22.2	66.7	22.2
NURSING	22.7	63.6	54.6	45.5	40.9	50.0
NUTRITION	8.3	83.3	58.3	58.3	33.3	50.0

TABLE III

The Comrey Test was administered to 112 students. Using a subset of these subjects we considered the results of the 65 that completed both this test and the Learning Preferences Inventory correctly. Statistical analysis of the dimensions of the data from our survey showed correlations very similar to the one presented by Comrey in the description of his instrument.

In this survey conducted by Villa Verde[8] the average scores for all 65 students in the eight scales of the Comrey Test were the following:

	Scales	$\overline{X}$	δ
T	Trust X Defensiveness	50.3	10.7
O	Orderliness X Lack of Compulsion	55.6	7.6
C	Social Conformity X Rebelliousness	54.6	8.6
A	Activity X Lack of Energy	52.9	9.0
S	Emotional Stability X Neuroticism	54.1	9.1
E	Extroversion X Introversion	48.4	9.5
M	Masculinity X Femininity	50.1	9.2
P	Empathy X Egocentrism	52.9	8.1

We found that the scores of the Comrey Test scales may vary from 21 to 79, the average being around 50 for Brazilian students.

The percentage of students with high scores in the Comrey Test scales in the four different Health Sciences Courses is presented in Table IV.

High scores were obtained for all students in the dimensions "order", "activity" and "emotional stability"; high scores in "social conformity" were obtained in students of Dentistry, Nursing and Nutrition; high scores for "empathy" were observed in Nursing students and a high score for "extroversion" was obtained in students of Dentistry.

SELF-INSTRUCTION

In 1973 we started a project sponsored by the National Center of Man-power of the Secretary of Planning (CNRH-IPEA/SEPLAN) to develop self-instructional courses in the Biomedical Sciences.

This project took advantage of the experience of The Ohio State Uni-versity College of Medicine Independent Study Program (ISP) and accepted several basic postulates in the planning of the courses, such as recog-nizance that the students differ between themselves regarding their entering characteristics, style and rate of learning, receptivity and interest toward different subject matter.

The development of self-instructional courses was done according to the following steps:

- course modularization

- definition of pre-requisites

- construction of diagnostic evaluation tests and selection and/or preparation of instructional materials to correct deficiencies

- definition of content and process objectives with their "en route or intermediary objectives

- selection and/or design and production of instructional materials in different formats (books, articles, self-instructional modules, programmed instruction units, slides, audio-tapes, films, video-tapes, etc.)

- development of a computerized formative auto-evaluation system

- construction of summative evaluation tests.

Exposition of students to formal didactic presentations were limited to a few conferences designed to introduce a topic or to stress its relevance

and to 1 or 2 weekly seminars to discuss points in which a significant number of students showed some difficulty in achieving the objectives.

Practical laboratory work was elective since it was accepted that it should be considered as compulsory only when psycho-motor objectives were indicated for a course. Each group of 40 students had a designated tutor that was available to the students, either in groups or individually, during assigned hours.

All instructional materials were made available to the students in the Learning Resources Center. In order to study the efficiency and effectiveness of self-instructional programs as compared to conventional teaching, a study was undertaken by our staff. Preliminary results were presented and discussed elsewhere[11].

Second-year students were offered the opportunity of learning either by self-instruction through the usual lectures, seminars, and group-work in two courses (cardio-respiratory and endocrine system). Objectives of each course were the same for both teaching methods and the same summative evaluation instrument was administered to all students.

The experimental variable corresponded to self-instruction, encompassing the student's active interaction with the available instructional materials and the student's interaction with a formative evaluation system presented by the computer. A list of instructional objectives was delivered to the experimental group as well as to the two control groups when the course began. The experimental model adopted was the "post-test only control group"[12] conceived as follows:

$$R \qquad X \qquad O_1$$

$$R \qquad\qquad O_2$$

$$R \qquad\qquad O_3$$

Where $\underline{R}$ represents randomization of samples, $\underline{X}$ stands for the experimental variable (self-instruction, in this case), 0_1 results of summative evaluation of experimental group, 0_2 of control group A (volunteers), and 0_3 of control group B (non-volunteers).

In order to better compare the three groups, the following measures were obtained:

N_1 - scores obtained at the University's admission examination

N_2 - grades obtained in the discipline of Biophysics

N_3 - grades obtained in the discipline of Neurophysiology

(Both the disciplines of Biophysics and Neurophysiology were considered pre-requisites for the courses on Physiology of the Cardiovascular, Respiratory, Endocrine and Reproduction Systems.)

Q_1 - percentile on the Raven progressive matrix test (nonverbal intelligence)[13]

Q_2 - percentile on D.A.T. battery test[14] on verbal reasoning

Q_3 - percentile on D.A.T. battery test on the use of language/orthography

Q_4 - percentile on D.A.T. battery test on the use of language/sentences

P_1 - grade obtained in the diagnostic evaluation of the cardio-respiratory systems*

P_2 - grade obtained in the diagnostic evaluation of the physiology of the endocrine and reproduction systems*.

To determine to what extent control variables could influence students' results in summative evaluation, a stepwise regression analysis was done taking into account the analysis of personality features obtained through the

(*) Tests to measure the student's knowledge in subject matters considered as pre-requirements for the respective courses.

16 PF test[15].

The results obtained were the following:

a) Self-instructional course on the Physiology of the Cardiovascular and Respiratory Systems.

Factors interferring with summative evaluation:

- mark in Biophysics (20%)

- mark in Neurophysiology (6%)

- non-verbal intelligence (3%)

Other factors have not significantly interferred. Adjusting the average of summative evaluations to the control-variables to thus compare equivalent groups, the following information could be obtained:

GROUP	AVERAGE	ADJ. AVERAGE
Experimental	7.36	7.50
Control A (volunteers)	7.17	6.95
Control B (non-volunteers)	7.18	7.24

The covariance index did not show significant differences (F = 1.974, DF 2 and 66).

b) Self-instructional course on the Physiology of the Endocrine and Reproduction Systems.

Factors interferring with summative evaluation:

- mark in Neurophysiology (22%)

- non-verbal intelligence (3%)

- mark in Biophysics (2%)

Other factors have not significantly interfered.

Adjusting the average of summative evaluations to the control-variables to thus compare equivalent groups, the following data could be obtained:

GROUP	AVERAGE	ADJ. AVERAGE
Experimental	6.89	7.01
Control A (volunteers)	6.87	6.66
Control B (non-volunteers)	7.42	7.39

The covariance index did not show significant differences $(F = 2.404, DF\ 2\ and\ 66)$.

Our experience with self-instruction did not indicate any significant learning differences when compared to the experimental group and the control groups (volunteer and non-volunteer students). However, we believe results have been favorable in what concerns an outstanding diminution of the weekly teaching tasks/student, which corresponded to 4 to 8 hours/40 students for the experimental group and to 20 hours/40 students for the control group.

As pointed out by Stufflebeam, et. al.[16], one of the problems educators must cope with when comparing results of educational experiments is the obtaining of statistically non-significant data.

Dubin and Taveggia[17] analyzed the data from almost 100 experimental studies comparing the effectiveness of different teaching methods and con-cluded that there was no significant correlation between teaching method and student achievement. The following comparisons were scrutinized:

- lecture X discussion

- lecture X lecture and discussion

- supervised independent study X lecture

- unsupervised independent study X supervised independent study

The criticism that could be made of these studies[18] is that the criteria used to compare the effectiveness of different instructional methods were students' results in summative exams which just measured students' knowledge of the subject matter. If other parameters such as information retention and/or application, problem solving skills or affective changes were measured, perhaps significant differences could be found. Furthermore, it is likely that different instructional methods would be more effective for different students.

FORMATIVE EVALUATION AND SELF-INSTRUCTION

Self-instruction depends on the development of a tutorial, or formative, evaluation system able to furnish efficient information about the students' learning.

This tutorial evaluation system corresponds to a program presenting questions to be answered by the student. Upon each response, there will be feedback which through additional information, hints, or clues, orients the students' answer. While answering the self-evaluation questions and thus, ascertaining whether he has reached the objectives of the course, the student will have learned a great deal.

The experience gathered at Ohio State University College of Medicine with its whole basic medical course given in self-instructional methodology shows that for each 40 study hours (utilizing manifold educational resources, among which the book stands as the most important instrument), the student

will interact with the computer terminal for 1 to 2 hours. Consequently,
each terminal of a system available 12 hours/day may be used by about 40
individuals. Since a great number of students can use this system (30
terminals will serve 1,200 people), it becomes a rather economic process.
Adoption in our own universities might be foreseen.

At the end of his self-evaluation, the student will receive a study
prescription on the computer, stressing parts of the course in which more
mistakes were made, and recommending the right tools, among the available
instructional resources, for the improvement of his knowledge. As the
student will often come to discuss his problems and difficulties with his
tutor, he can continuously improve his learning.

This system will, of course, conduct the student's learning according
to his own rhythm. Though the faculty may fix maximum acceptable limits,
minimum ones should not be imposed for the sake of over-wise students.

In order to start the utilization of software developed at The Ohio
State University, an agreement was signed betwee NUTES/CLATES and that
University, thanks to the interest of the Pan American Health Organization.
The system was put in full operation using the equipment available at the
Data Processing Center of our University (IBM 360/40 computer) for
demonstration purposes.

From the beginning, however, we believed that adaptation of tutorial
evaluation software to smaller size computers would be of utmost impor-
tance - thus facilitating their dissemination in Brazil and South America -
NUTES/CLATES' staff studied the several configurations of equipment and
programming-language, having finally chosen the possibility of employing a
high level language, the socalled MIIS (Meditech Information Interpretative
System), implemented on the DEC-PDP-15/75 computer.

Thus, NUTES/CLATES acquired a DEC computer (Digital Equipment Co.)

PDP-15/75 and the MIIS operational language system, with financial help

from the Brazilian Ministry of Health and the W.K. Kellogg Foundation.

An agreement was then signed with the Brazilian National Development

Bank, through its Fund for Technological Development (BNDE/FUNTEC)

in order to develop programs written in MUMPS/MIIS (Massachusetts General

Hospital Utility Multi-Programming System/Meditech Information Interpretative

System) to allow use of minicomputers in Education and Health Systems.

An adaptation of the "Beth Israel Converse Driver" was made up by

NUTES/CLATES' analysts with the purpose of developing formative evaluation,

in provisional character, during the year 1974[19].

In 1975, the operational parameters for an instructional driver were

defined, a "driver" being a collection of routines written in MUMPS/MIIS

which afford converational conditions for on-line multiple users.

This driver enables professors, educators, or instructional programmers

(that is, individuals unfamiliar with MUMPS/MIIS programming) to enter

instructional materials through a computer terminal in the form of questions

for formative evaluation, with the corresponding feedback for correct and

incorrect answers, and questions which can make up final examinations as

well as offer the student the opportunity for self-evaluation as he inter-

acts with the computer on a terminal (CRT or printer).

Additional information on this instructional driver has been reported

elsewhere[20].

A study of the correlation between the student performance in the

formative evaluation and results of the final evaluation made through an

objective examination measuring student cognition in the various levels

and another examination to measure student capacity of solving clinical

problems by applying knowledge of basic sciences was undertaken.

This research work is a continuation of the study performed in 1974 trying to demonstrate the validity of the self-instructional method.

The population studied consisted of students enrolled in the courses of Cardio-Respiratory and Endocrine-Reproduction Systems.

The studies performed on data obtained from the Cardio-Respiratory System Course showed that the results of the diagnostic and formative evaluation were not predictors of the students' results in summative evaluation, although these evaluations showed internal consistency, as displayed by the factor analysis.

The distribution of degrees in the formative evaluation is moving to the right with each succeeding module. Thus, it appears that there is a learning process along the course through which the student would gradually improve his marks in the formative evaluation.

SELF-INSTRUCTION AND RETENTION OF KNOWLEDGE

This research aims to measure if students that learned basic principles and concepts of the Cardio-Respiratory System through self-instruction or through conventional teaching would have different results when applying this knowledge in the course of Cardiology on the Clinical Cycle of the Medical Course[22].

We had also to face another problem, that of assessing the influence of hospital practice on the learning of Cardiology, since students were distributed in 3 different hospitals by a chance distribution, as shown in Table V.

A non-conventional path analysis model was used to study the data obtained as displayed in Figure 2.
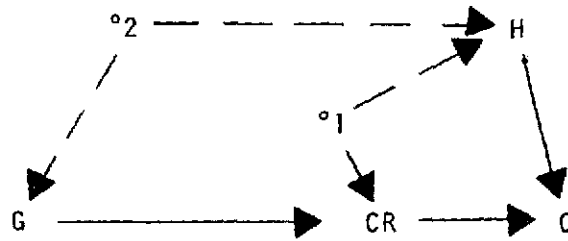
FIGURE 2

Where G corresponds to a categorical variable representing the
instructional groups of students that learned the Cardio-Respiratory
System either through self-instruction or through conventional teaching
(two random selected groups chosen between students that volunteered for
self-instruction and were not accepted in the experiment and between non-
volunteers - controls A and B); CR is a numerical variable corresponding
to the summative evaluation average grade in the Cardio-Respiratory System
Course; C is a numerical variable corresponding to the final grade in
Clinical Cardiology; and, finally, H is a categorical variable representing
the hospital assignment of the students. We intend to analyze the effect
of G (representing the teaching method employed) in C, CR being the link
between them, and adjusting the results to the influence of H.

The statistical analysis performed showed a correlation of 0.370 which
corresponds to a moderated effect.

Nevertheless, the results obtained in the summative evaluation of
Clinical Cardiology displayed at Table VI did not show a statistically
significant difference between students from the 3 instructional groups
(F - 2.40, DF 2 and 107) although the experimental group showed consistently
a higher average as compared to the control groups.

SELF-INSTRUCTION AND INTEGRATION BETWEEN
THE EDUCATION AND THE HEALTH CARE SYSTEM

Medical education has been oriented through the years towards the

formation of physicians prepared to offer quality care for a relatively

limited number of patients in a hospital setting, often sophisticated and

specialized. The Preventive Medicine programs, added in recent years to the

medical curriculum, are generally developed in "teaching" health centers or

community "laboratories" which do not provide the environment and the

learning opportunities needed to form an "integral" physician.

Large portions of the world population do not receive appropriate

care for their health problems, or simply receive no care at all, and

medical education does not take these facts into consideration.

On the other hand, one of the big problems of our society is the

widening gap between existing knowledge and its application to the solution

of day-to-day problems. This implies the need to develop new approaches in

health care, in order to provide services for all, using available and often

limited resources.

The use of screening systems, the work in health teams, the delegation

of functions to allied health personnel, the transfer of activities from

physicians to nursing personnel, and the responsibility for the care of

defined populations are all part of these new health care approaches; and

to make them accepted new teaching settings must be organized; new attitudes

and values developed, and new professional models offered to the students.

The University Hospital, as conceived today, should be used mainly for

specialized and post- graduate training and we should use the health care

system as a whole, including the community that it serves, as the training

ground for health sciences professions.

The University Hospital as a tertiary care or referral agency, would be the basic unit of a system that would comprehend general hospitals (secondary care), community health units - urban, and rural - (primary care), including those from the sophisticated·intensive care unit to extensive home visitations and the sanitary control of the environment.

Working actively in the different levels of health care, the student of a health sciences profession will be exposed to the full spectrum of diseases and health problems, will understand the importance of knowing the natural history of diseases in order to detect vulnerable points where his intervention will result in the recovery of health, or will diminish the possibilities of physical or functional sequella. He will understand the importance of team work and the need for a multidisciplinary approach to solving health problems.

He will have the opportunity to study man in his environment and will grasp the importance of socio-cultural factors in the genesis of diseases and in the men's own conceptualization and valorization of health and diseases.

The utilization of all potential educational situations within the health care system to train health manpower will improve the quality of the services rendered to the population. This can be accomplished by continuously up-grading the medical knowledge of the health sciences professionals involved in teaching and health care delivery while training health care professionals who are better prepared to promote, maintain and recover the health of man.

The design of self-instructional programs which utilize pedagogical strategies like: students' learning styles, mastery learning, self-instructional materials formative evaluation and curriculum study modules is considered as basic to a sound and realistic learning methodology for health

sciences professionals whose goal is to train the manpower needed to extend

and improve the health care rendered to the people.

REFERENCES

1. Kolb, D.A., Rubin, I.M. and McIntire, J.M., Organizational Psychology -
   An Experiential Approach, Englewood Cliffs, N.J., Prentice Hall,
   1971.

2. Carroll, J.B., Model of School Learning, Teachers College Record,
   64:723, 1963.

3. Block, J.H. (ed.), Mastery Learning Theory and Practice, New York,
   Holt, Rinehart and Winston, 1970.

4. Bloom, B.S., Learning for Mastery, UCLA, Center for Study of Evaluation
   of Instructional Programs, Evaluation Comment, 1: n° 2, 1968.

5. Rezler, A.G. and French, R.M., Personality Types and Learning Pre-
   ferences of Students in Six Allied Health Professions, Journal of
   Allied Health, : 20, 1975.

6. Myers, I.B., Manual for Myers-Briggs Type Indicator, Princeton, N.J.,
   Educational Testing Service, 1962.

7. Goldberg, L.R., Student Personality Characteristics and Optional
   College Learning Conditions, University of Oregon, ORI Research
   Monographs, Vol. 9, n° 1, 1969.

8. Villa Verde, M.N.S., Caracteristicas de Personalidade e Preferencias
   de Aprendizagem, Um Estudo Exploratorio (Thesis). Rio de Janeiro,
   Fundacao Getulio Vargas, 1976 (mimeographed).

9. Comrey, A.L., Manual for the Comrey Personality Scales, San Diego,
   Educational and Industrial Testing Service, 1970.

10. Comrey, A.L., Manual para as Escalas de Personalidade de Comrey,
    Traducao, Adaptacao e Padronizacao de Rodrigues, A., Rio de
    Janeiro, Departamento de Psicologia da PUC/RJ, 1973.

11. Machado Coelho, M.A.S., Eficiencia da Avaliacao Formativa na
    Aprendizagem, (Thesis), Rio de Janeiro, Fundacao Getulio Vargas,
    1975 (mimeographed).

12. Campbell, D.T. and Stanley, J.C., Experimental and Quasi-Experimental
    Design for Research on Teaching, in Gage, N.L. (ed.), Handbook of
    Research on Teaching, New York, McGraw Hill, 1969.

13. Raven, J.C., Manual de Matrizes Progressivas, Traducao e Adaptacao
     de Campos, F., Rio de Janeiro, CEPA, 1965.

14. Bennet, G.K., Seashore, H.G. and Wesman, A.G., Manual do Teste de
     Aptidoes Especificas (DAT), Traducao e Adaptacao de Nick, E.,
     Rio de Janeiro, CEPA, 1965.

15. Cattel, R.B. and Eber, H.W., Manual Abreviado do Questionario de
     16 Fatores de Personalidade, Traducao e Adaptacao de Moraes de
     Andrade, E. e Godoy Alves, D., Rio de Janeiro, CEPA, 1968.

16. Stufflebeam, D.L., Foley, W.J., Gephart, W.J., Guba, E.G., Hammond,
     R.I., Merriman, H.O. and Provus, M.M., Educational Evaluation
     and Decision Making, Itasca, Ill., F.E. Peacock Publishers, 1971.

17. Dubin, R. and Taveggia, T.C., The Teaching Learning Paradox. A
     Comparative Analysis of College Teaching Methods, Oregon, Uni-
     versity of Oregon Press, 1970.

18. Centra, J.A., Strategies for Improving College Teaching, Washington,
     D.C., American Association of Higher Education, 1972.

19. Slack, W., Beth Israel Conversational Control Programs, Computer
     Medicine Division, Boston Harvard Medical School and Beth Israel
     Hospital, 1973.

20. Amorim, C.L. and Santos, S.L., A CAI System at NUTES/CLATES, in
     Zimmerman, J. (ed.), Proceedings of the 1975 MUMPS Users'
     Group Meeting, St. Louis, Missouri, 1975.

21. Flores, R.C., personal communication.

22. Roschke, M.A.C., personal communication.

I. Discussion Point: Cross Cultural Use of Instructional Materials

DR. PARKER SMALL: I am not sure this is an appropriate question at this point, but I have been told by others that in translating materials from one language to another you must be terribly concerned in not just translating words but in translating the cultural aspects as well. How much has gone into the translation of your materials?

DR. LOBO: We used Ohio State University's curricular materials mainly to demonstrate to our teachers the use of this new technology. All our programs have been fully developed by our own professors. At the present time all of our software is completely different. We have even gone to the extent of using our own unique hardware. We are using MUMPS computer language on a small machine.

DR. SMALL: Now that I realize that you have developed all of your own material, it raises the other side of that same coin and that is the amount of work to develop some of these instructional materials is obviously tremendous. To what extent can they be exchanged across cultural barriers and even between institutions within your own culture? Is it really worth it if each institution has to develop its own and to what extent can sharing take place?

DR. LOBO: That depends very much on the subject matter content and on the educational context as well. For instance, certain aspects of the basic sciences are about the same all over the world. That means if you are analyzing some kind of physiological aspects of the heart functioning, the mechanics of the heart, this is the same either here or in Latin America.

So, you may use some of the materials cross-culturally. We didn't use the Ohio State materials because we had more detailed intermediary and terminal internal objectives. We also tried to have the formative evaluation system built up in such a way that we could measure all intermediary steps to achieve the terminal objectives. So, our system is certainly more comprehensive then the Ohio State material. We have more questions to measure intermediary steps. It certainly takes a lot of time but you will see I am using a university which has a very large faculty. They are concerned that the continuous increase in student body would increase their teaching load. This, of course, is definite restriction on the research activities. We have been successful in getting the faculty to accept the idea to dedicate a certain amount of time to the development of instructional materials initially. They will then stabilize their teaching load at a later time. We are also providing them with a great deal of support. We have educational psychologists, educators and faculty working together.

DR. SMALL: Are other medical schools now coming to you and asking to use your materials?

DR. LOBO: Yes, although at the present time it is primarily instructional resources, namely, audiovisual materials. We do anticipate that the distribution of these materials will become more widespread in the near future.

DISCUSSION POINT: MINIMUM AND MAXIMUM STUDY TIMES

DR. FULOP: On page 22 you say in the second paragraph that although faculty should fix maximum acceptable limits, minimum ones should not be imposed for the sake of over wise students. I would like you to explain it a bit further because what I understand from this is that if someone knows more

than what is acceptable he will fail.

DR. LOBO: I think when we fix a maximum acceptable limit and a time of learning because we need to encompass certain problems at the university, a minimum time should not be set because if students have mastered the material they should not be required to remain in the program.

DISCUSSION POINT: UNIVERSITY COMMUNITY ISOLATION

DR. ELMORE: It has been my observation in the working of the field of sanitary engineering which is not unlike medical services in general, that when the problem of isolation in the university is frequently accused of being an ivory tower institution, that does not properly project easily in society. The opposite is also true that health service institutions do not properly project themselves into the university and make the university feel welcome in their environment. It is most unusual to have a chief of a, for example, air pollution program to visit the university and get acquainted with the educational technicians and to make it known that he welcomes students in his working environment.

DISCUSSION POINT: SELF-INSTRUCTION IN THE HEALTH CARE SETTING

DR. FULOP: A second question, if I may? I would like you to explain a bit further what you have started to explain when you are discussing self-instruction and integration between the education and health care system.

DR. LOBO: I based my discussion on this section on my experience sending students in Brasilia to community hospitals for clinical training. I found that very often the physicians in these hospitals feel uncomfortable if you simply sent the students to them without preparing them to be preceptors.

It is very important to make physicians and other health care workers
at the community level realize what is expected from them and then what
kind of instructional resources the students will have with them to help
them with their learning and finally, how the student will be evaluated.
My own experience in Brasilia is that when ever you tell the physicians
working in the health care services this, one of the first consequences is
that they immediately recycle themselves for further education.   They
interact with instructional resources and instructional materials and then
they feel better about interacting with students so that whenever we send
students into the community our idea is not to have the professionals working
in the health cares services acting as professors, but mainly offering
them certain kinds of learning opportunities.   Of course, a student must go
there with some kind of materials to be learned, to interact within an
instructional manner.   Therefore, self-instruction is a very important tool
for them.   That is my own experience, but, of course, as you can see, most
of the work at the present time in self-instruction has been done in the
basic sciences.   We are beginning to do studies in the clinical sciences and
in continuing education.

DR. BRYANT: Could you help me and see how your approach to self-instruction
programs will function when students are outside the classroom setting?

DR. LOBO: I believe that most of the content information transferred can
be done by self-instruction.   When students are incorporated into the health
care team they have two important roles to play.   One is the provision of
health care services, therefore, will acquire valuable clinical experience
which has some input to their education.   Their second role, however, is to
acquire new knowledge and information.   We cannot expect the physicians and
other health care workers to function as teachers transferring information

to the students. This can best be done through self-instructional modules

or through self-instructional materials.

DR. BRYANT: Do you have a combination, then, of self-instructional materials

plus participation in field of settings?

DR. LOBO: Yes.

DR. BRYANT: Then, if I may just press this point for a moment, let us say

that we know that most of the health care systems as they exist now in many

of the countries that we are from do not function in an ideal manner. How

do you deal with the learning problem of your learning instructional materials

making some point, the students being in a field situation with a health

care system which does not exemplify the points that are in the instructional

materials? I may be asking the impossible question.

DR. LOBO: No, it depends very much on the focus of your self-instructional

materials. If it is just content, information content, you may have the self-

instructional materials used in a variety of situations. If your ob-

jective is to develop skills and new capacities, then it is very often

difficult to have that done through self-instructional materials per se.

But, I do believe that if you ask each of us here, we are all trying to use

resources other than our own university hospitals. Finally, if you are

sending students into the field and if he cannot come back and have the

support of his university teachers, some other type of field support must

be provided. That is where I find self-instructional materials play a very

important role.

DR. BRYANT: Just to conclude these questions for clarification, it seems to

me that with respect to students learning how to function in a health care

system outside university hospitals that the self-instructional materials

play an important role but not a major role. Let's say that they play a
role, they play a role that is not a dominant role. The way in which the
student participates in the health care system himself and the people who are
providing the health care within the system serve as role models remain
crucial and that good self-instructional material cannot substitute for a
good learning situation in the field.

DR. LOBO: I agree with that. If self-instructional materials could be
substituted for everything we would not have a need to send the student out
into the field. We would just provide him with self-instruction and nothing
else. I believe also that the exposition of the student to the health care
system is so important that I personally believe that twenty years after
graduation it is difficult to distinguish where a student trained -- Alabama,
Harvard, or from different places.

DR. MEYER: How can you take independent study which is by definition some-
thing that one does by one's self and then jump that to say that because
they are doing independent study in a community hospital they will therefore
understand the health care team? And this is the trouble that I was having
in jumping from the one assumption to the other because I just don't think
it happens unless you structure very carefully the team within which the
student meets his role model and then superimpose independent study on that.

DR. LOBO: The effect is that you are sending them to the outside; you are
not expecting, as I said, that the people working there would function as
professors and would reveal all kinds of new information. Very often the
students will need some kind of support, some kind of back-up, some kind of
materials to read and learn more about a particular problem which they
encountered in the clinic. Self-instruction materials may be a book, it is

a self-instruction material. Just pick up a book and read it. It is not

necessary to have programmed instruction. So, a book is a kind of support

for him in the community. You must provide this support also, not just

send him away and trust that the people in the health care system provide

it.

DISCUSSION POINT: LEARNING STYLES AND SELF-INSTRUCTIONAL PROGRAMS

DR. STRITTER: Dr. Lobo, I'm trying to relate your use of and research on

cognitive learning styles with your development and use of self-instructional

programs. I'd like you to clarify this point for me. Are you suggesting

that students be assigned instructional treatments or instructional

experiences based on learning styles or learning preferences or are you

suggesting that instructional materials be developed based on research

into learning styles? I'm not exactly sure of the point that you're

making here.

DR. LOBO: When we used these courses in self-instruction in basic science

for medical students there was very good acceptance. Then, when we tried to

apply these courses to nursing we had some difficulties. We then thought

that we would have some differences in applied learning styles preferences

in the two groups of students and perhaps the medical students would show

that they prefer more student structured courses than the nursing students.

We didn't get this result. But, I do believe that what we should do is

to make a large number of instructional resources available, including

perhaps some teacher structured experiences, for instance, lectures and

make this a part of the whole package. Each student will try to find in

the materials you offer what kind of resources will better be adapted to

his own style. I do believe that to teach students the habit of self-instruction is basic and so I think we should have more experiences using learning styles and perhaps pass the students along the course and see if they are adapting better to this kind of self-instruction. I do believe that it is very important to teach the student to use self-instruction because to me it's very difficult to conceive that a student that learned passively throughout his academic year will transform himself into an active learner after graduation. And, if you accept that education, medical education, is a lifelong process, I think that we should develop this habit in the students.

DR. STRITTER: Good point. Some of the writers, researchers like Whitkin and Cross, Messek and others, who've thought a lot about cognitive styles. recommend that you find out what a student's learning style is and then recommend that he get into other learning styles and be exposed to other teaching styles, teaching approaches, because the real world is not one learning style or another but a mixture of learning styles.

INTRODUCTION TO PAPER BY PROFESSOR McGUIRE

In this extremely well written paper Professor McGuire deals with the complex topic of evaluation specifically, the evaluation of community-based independent study programs. She begins by reassuring the reader that exactly the same principles that underlie sound evaluation models employed in the evaluation of traditional programs can also be applied to unconventional programs such as community-based independent study programs. However, evaluators of non-conventional programs should be aware that they face special technical and logistical problems.' Her paper addresses three major topics: 1) the accurate identification of programs that belong to the genuine community-based independent study programs; 2) the general model recommended for educational evaluation; 3) special applications of that model to the group of programs under discussion.

The first section of the first major topic, program identification, deals with definitional issues. She stresses that it is extremely important that both community-based and independent study be sharply defined. Under community-based she stresses the importance of the goals and the nature and setting be specified in such a way as to make the community-based program clearly identifiable and distinguishable from other programs. Of the term "independent study", again, the goals and nature and settings of independent study programs must be sharply defined in order to facilitate failure of programs that carry the label independent study. She assists the reader, as she did the participants of the conference, by raising a number of key issues relative to the definitional issues by asking such questions as, "Independence from what, and for what purpose(s)?"

In the second major topic, the generalized evaluation model, Professor

McGuire stresses the importance of defining the objects and purposes of evaluation. The objects being the student, faculty and the program. The purpose being to make inescapable decisions about the final disposition and/or for monitoring progress in order to council improvements in each of the objects of the evaluation process. In order to complete the model, a focus of evaluation, in order to direct data collection relative to the objects of the evaluation, must be specified. Input variables, process variable, and output variables all must be identified and data collected relative to each of them.

The paper continues with a section of methological considerations in applying the model particularly drawing attention to the sources of data and the nature of criteria to be employed in making the required decisions.

The third major topic covered in this cogent paper on evaluation takes the general evaluation model and outlines in Section 2 and develops an application to the evaluation of community-based independent study programs. While the general model can be applied to the evaluation of any educational program, the application section of this paper focuses on the special technological and logistic problems that one is likely to encounter when evaluating a community-based independent study program. In the first section, specifying the purpose of the evaluation, difficulties in establishing criteria for student evaluation are discussed in detail and many valuable suggestions brought out.

The potential use of simulations as a data collection instrument is suggested as a possible solution to the logistic and technical difficulties encountered when one begins consideration of the data collection program for the evaluation of community-based programs. In the section on collecting data, Professor Mcuire stresses that it is extremely essential to determine

in advance who is to respond, the timing of the responses and the condition

under which these responses are made. This section is followed by an

interesting discussion of the difference between relative and absolute

standards. The paper closes with a discussion of issues in summarizing,

interpreting and reporting evaluation results. This paper, although designed

as a guide to those considering the evaluation of community-based independent

study programs, is well worth reading for anyone interested in a sound, well

written overview of the evaluation of educational programs in medical

education.

EVALUATION OF COMMUNITY-BASED INDEPENDENT STUDY PROGRAMS
By Professor McGuire

In order to plan and implement an evaluation of any program, or set of

programs, it is first necessary to define the essential elements in the class

of programs under consideration. On completing this task it becomes possible

to match the specific characteristics of particular programs with the ele-

ments previously defined as essential, and thus to identify accurately those

programs to be included in the category to be evaluated.

But it is this first step which presents one of the greatest diffi-

culties in the design of a total evaluation system for community-based

independent study programs. Once the definitional issues have been resolved

the selection and implementation of an appropriate strategy for evaluating

these newer programs should be based on precisely the same principles that

underlie sound evaluation models employed in more traditional programs.

However, it must also be recognized that in applying these principles to

unconventional programs, the evaluator is likely to encounter special

technical and logistical problems that must be satisfactorily resolved, if

any credence is to be placed in the results of the evaluation. Given such

a view, this paper must necessarily be addressed to three major topics:

1) Accurate identification of programs that belong to the general

"community-based independent study programs;" 2) the general model recommended

for educational evaluation; and 3) special applications of that model to the

group of programs under discussion.

Definitional Issues

Both terms in the title , "community-based" and "independent study"

present problems. The programs that identify themselves with one or both of

these descriptors vary enormously with respect not only to setting, structure, objectives and methods of implementation, but, most importantly, also differ even with respect to fundamental purpose. While all physician education is designed ultimately to improve the quantity and/or quality of health care available to the public, some programs have been redesigned with improved health care as their immediate goal. Thus, some innovations in medical education constitute a direct response to pressing societal needs; others, to pressing student needs.

Community-Based

Goals. The diverse purposes which various community-based programs are expected to serve illustrates this point vividly. Specifically, in the United States such programs have been established primarily in response to perceived deficiencies in student experience with ambulatory medicine and primary care. In contrast, in many other countries of the world the motivating force behind the establishment of community-based programs has been the immediate need to expand the quantity or elevate the quality of health care available to some portion of the public. Any evaluation of community-based programs must take full cognizance of these differences in primary goals.

Nature and Setting. Similar lack of uniformity exists in the nature and setting of the many programs that call themselves "community-based". Are we, as has been sometimes suggested, to limit the term "community-based" -- to refer only to "remote site" programs that take place in an essentially rural setting, or are we to include all those programs occurring in affiliated institutions -- (both basic science and clinical facilities) located around the corner from the medical school and its university hospital? Second, is a genuine "community-based" program concerned primarily or exclusively with the community health problems traditionally

considered the province of public health and preventive medicine? Third,

with respect to individual patient care, is a community-based program one

that necessarily deals primarily or exclusively with ambulatory medicine, in

a primary care setting? Or, shall we also consider those inpatient programs

that take place in a tertiary care center which differs from the university

hospital only in regard to funding and governance? If we wish to generalize

about the efficiency and effectiveness of community-based programs, clearly

these issues must be resolved--for, surely, inclusion and exclusion of

particular programs in a study sample may modify our findings.

Independent Study

Goals. Determination of the criteria to be used in identifying

"independent study" programs presents no less difficulty. For at least

the past half-century education leading to a professional degree (e.g.,

M.D.), in contrast with that leading to an academic degree (e.g., Ph.D.),

has, until very recently, been characterized by increasing rigidities: all

students are expected to go through exactly the same paces, in exactly the

same sequence, in exactly the same length of time. Indeed, it sometimes

appears that the hallmark of a profession is the definition of a common

set of experiences which every member of the profession is expected to have

encountered, rather than what might more logically have been anticipated--

namely, a common set of standards that every member of the profession is

required to meet. In fact, the more "mature" and "respected" professions

can be readily identified by their success in establishing quasi-legal

certification and accreditation bodies whose primary functions are,

respectively, to determine that each aspirant for certification has

"completed an approved program", and to assure that the "approved" program

has facilities for, and does indeed offer, the requisite experiences. Rigid

prescription of each professional's training experience was thus the primary instrument of quality control. It should be apparent that so long as homogeniety of experience is the sole, or even an important enforcement weapon, any kind of flexibility (other than minor efforts at "enrichment") becomes the enemy of quality.

In an honest revulsion against this view and in recognition of the fact that medical students, like other members of homo sapiens, differ with respect to their goals, interests, background, learning styles, learning preferences and learning rates, various innovations have been attempted. Thus, in some instances a so-called independent study program has been introduced as an alternative to the regular program and in direct response to perceived needs of students. In such situations costs of the program are not necessarily viewed as limiting factors in its evaluation. However, in other circumstances, independent study is seen as one possible strategy to meet critical societal needs for expanding health manpower, given limited resources and escalating costs of traditional programs. Where these considerations are involved, the cost-benefit of independent study becomes primary in program evaluation.

Nature and Setting. Responses, whether to student or to societal need, have ranged from brief flirtations with such educational fads as programmed learning, through introduction of new modalities and media, systematic expansion of such resources as self-instructional and self-assessment packages, alternate or elective programs of an independent study type, to establishment of competency-based programs, entirely new, fully self-directed programs or even the almost totally student-centered programs. These innovations represent varied presuppositions about the urgency of different needs, the shortcomings of traditional programs,

the relative emphasis to be placed on certain facets of learning theory
and their implications for change. Despite this obvious fact there has
been a tendency in some of the literature on this subject to define the
term "independent study" in such a manner as to encompass all non-traditional
programs; even those in which the only departure from the conventional
lock-step curriculum may be limited to provision of additional learning
resources, or elimination of large group activities, or introduction of
flexibility in the time constraints placed on students for completing the
program. In other literature, the term appears to be restricted to that
small class of programs in which only a limited number of terminal ob-
jectives is specified and all other aspects of the program--additional
goals, instructional materials, and strategies, sequence and timing of
learning experience and overall expected outcome--are completely individual.
Between these two extremes can be found an increasing number of programs in
which the expected outcomes, the instructional materials and learning re-
sources, and the standards to be employed in determining that an individual
has completed the program are all clearly specified and are identical for
all learners; "independence"--to the extent it exists in these programs--
consists in assigning to the student full responsibility for selecting
and combining materials and resources in any manner and in virtually any
time frame each individual finds expedient in reaching the expected level
of achievement.

A Generalized Evaluation Model--Overview*

While resolution of the definitional issues discussed above is essential

---

*Adapted from McGuire, C.H., Evaluation for Decision-Making: A Con-
ceptual Framework. In Academic Decision-Making: Issues and Evidence,
Association of American Medical Colleges, Washington, D.C., 1976.

not only to the design and implementation of any particular evaluation but
also to the specification of hypotheses to be addressed, the general model
and the requisite elements of the support system are completely analogous
to those required in the evaluation of any other educational program--
from the totally traditional to the completely unconventional.

Objects and Purposes of Evaluation

In any educational situation the student, the faculty and the educational
program each require evaluation. With respect to each of these three objects,
evaluation is always undertaken for the purpose of making the inescapable
decisions about final disposition and/or for the purpose of monitoring
progress in order to counsel improvement.

Student Evaluation. With respect to students, the "disposition"
decisions are, or should be, addressed to one single question: "Does this
individual meet the standards that have been established?" This type of
determination is involved in every decision about selection and admission,
promotion and graduation, licensure and certification. Increasingly, for
both legal and ethical reasons it is necessary to be able to document such
decisions with detailed, reliable, valid and objective data that accurately
describe each student's characteristics and competencies in relation to
accepted standards. Student evaluation for purposes of counseling requires
similarly precise measurements of each student's level of functioning with
respect to numerous requisite cognitive and non-cognitive attributes, in
order to arrive at an accurate educational diagnosis and to develop a specific
educational prescription that will assist each student to maximize pro-
fessional competence and satisfaction, with minimal waste. However, as
we shall see, student evaluation for purposes of selection and admission

and for purposes of counseling may assume special importance in independent study programs. Furthermore, serious technical and logistical problems are certain to be encountered in attempting to collect reliable data on which to base any decision about students on such programs.

Faculty Evaluation. With respect to faculty, the "disposition" decisions for which sound data are required are those having to do with hiring, firing, promotion and assignment. To avoid capricious application of idiosyncratic standards in this arena, it is essential that each institution develop clear, explicit definitions of what an effective teacher is, what the intervals of evaluation will be, and how performance will be measured. Only then will it be possible to meet the demands of both faculty and public, for administrative accountability--demands that have been fully legitimated by repeated court decisions, at least in the United States. Similarly, when it comes to monitoring faculty performance for purposes of counseling, an information system that helps individuals to identify their own strengths and weaknesses, that aids them in satisfying personal desires for self-improvement in this area of professional performance, and that provides reliable data for planning and implementing appropriate faculty development programs is indispensable. Clearly, the general purposes for which faculty evaluation is undertaken in a community-based independent study program will not differ from those of any other faculty evaluation. However, the specific characteristics which distinguish superior performance, and the direction of counseling for improvement in independent study programs may be at great variance from those employed in conventional programs, simply because the role of the teacher is so radically different in the two settings. Further, the organizational structure of community-based programs and the practical realities of the faculty member's relation to the medical center in such

programs will certainly present special challenges for monitoring faculty performance and for implementing faculty development programs.

Program Evaluation. Finally, with respect to the evaluation of educational programs, the "disposition" decisions are obvious: at the national level they are everywhere concerned with issues of institutional accreditation and, in some countries, with issues of institutional funding. Of equal importance in this category are decisions at the institutional level about allocation of funds, space and personnel among approved programs that compete for these scarce resources. At both the national and the local level the fundamental question to be answered is: "To what extent has this program met the objectives that have been set for it and at what cost?" Rational decision about these matters requires a system of monitoring the relative efficiency and effectiveness of each approved program in order to determine cost-benefit for purposes of better resource allocation. Such monitoring also serves the counseling purpose by providing data that assist in identifying the strengths and weaknesses of each program, and that suggest modification in those educational settings and strategies which are demonstrated to be less than optimal.

Focus of Evaluation

These then are the objects and purposes of educational evaluation in both regular and independent study programs, whether community or university based. To complete this part of the general model, it is necessary to consider one additional dimension (Figure 1): namely, the focus of data collection.

Input Variables. In some instances that focus may be largely or exclusively on the organizational structure and resources of the object--

AN EVALUATION MODEL FOR

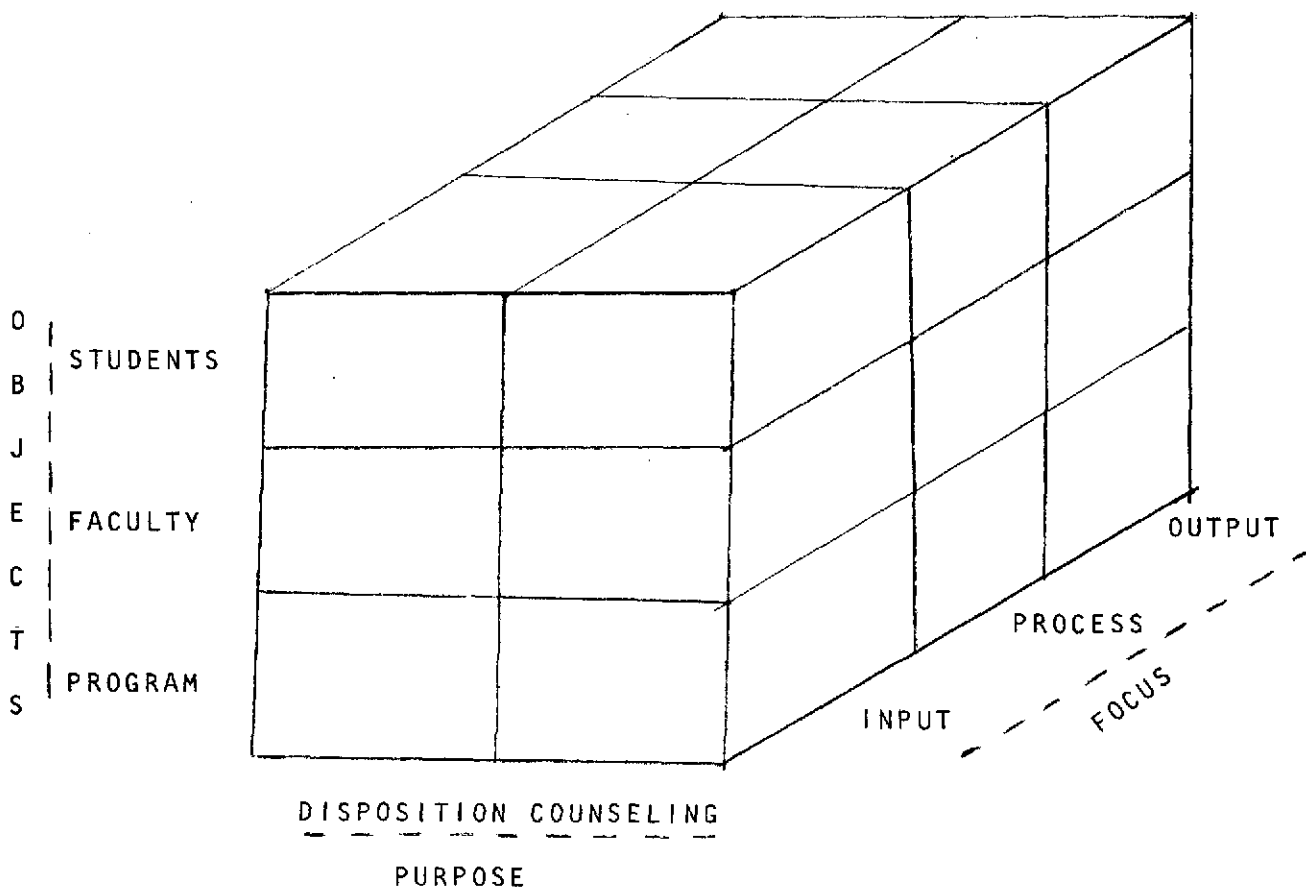EDUCATIONAL DECISION-MAKING

FIGURE 1

i.e., the <u>input</u> variables. These include student characteristics

(aptitude, personality, values, and background), faculty characteristics,

faculty investment in the program, the faculty/student ratio, the

laboratory and clinical facilities, and other educational resources assigned

to a program.

Process Variables. In contrast, collection of data about <u>process</u>

variables involves systematic documentation of what <u>actually</u> <u>occurred</u> in a

particular program or in a series of encounters between teacher and learners.

Where this approach is properly employed, the evaluator gathers compre-

hensive data about the extent to which the actual conditions for learning,

and the interaction between the learner and the environment are congruent

with those deemed optional for achieving a given set of objectives.

New types of instruments are becoming increasingly available for use

in gathering data about the nature of the learning environment characteristic

of a program and the quality of the communication--i.e., the interaction

between students and teacher--which takes place in that environment.

Nonetheless, it is doubtful whether process assessment can be used for

purposes of "disposition" decisions until such time as the basic connections

between process and product are unequivocally established. In the mean-

time, the utility of process assessment for purposes of counseling--i.e.,

as a research, a training and a diagnostic tool--is undisputed. As a

practical research tool in evaluating instruction, process analysis opens

up the opportunity of determining the relative effectiveness of alternative

elements in instructional strategy; as a training tool it enables teachers

to hold a mirror to their performances and to determine the extent to which

their actual conduct is a true reflection of their intended strategy; as

a diagnostic tool process assessment, when used in conjunction with product

assessment, yields data which may be of value in suggesting alternative hypotheses to explain actual outcomes that fall short of those intended.

Output Variables. The ultimate test of any system is its output, i.e., the product which it produces. In the case of an educational system that output is the performance of its students, in the broadest sense. Traditionally, however, focus on output, i.e., on outcome, product or performance has been limited to the evaluation of students primarily for purposes of promotion, graduation and certification. But if it is true that all teaching and all educational programs are undertaken mainly for the purpose of producing student learning, it follows that educational programs and the effectiveness of faculty as teachers can ultimately be assayed only in terms of the extent to which this intended outcome is achieved. A focus on output variables in the evaluation of faculty and of programs therefore requires the design of a data collection system to answer the question: To what extent has the educational strategy been effective in accomplishing the educaitonal goals? This issue is of central importance in the evaluation of both traditional and non-traditional programs.

Such a focus requires that the goals of the educational program (i.e., the outcomes sought) be clearly specified, that they be defined in terms of behavioral changes that are to be brought about in the learner, that test situational and/or observations of real life performance be designed to sample these behaviors that these test situations be administered to, and these observations be made on, learners to determine the extent to which each is able to perform in the desired manner and at the prescribed level of competence (i.e., to document the outcomes actually realized). The techniques used to assess performance may range from conventional tests of

information, through sophisticated simulations of clinical and community problems, to long-term, systematic observations of the learner in varied professional settings, as elaborated below.

However, since the evidence is mounting that, given adequate time, personal instruction ánd self-instructional resources, most anyone of normal intelligence and emotional stability can master any element among the objectives of medical education, no educational evaluation is complete in the absence of cost data, and of cost-benefit calculation. In the final analysis therefore educational evaluation of any program necessarily entails economic considerations in determining whom a country can afford to educate and at what level of mastery, i.e., at what cost in resources. Unfortunately, at present the only usable cost data tend to be those concerned with the direct money costs attributable to the construction and maintenance of specialized facilities (e.g., lecture halls, student laboratories) and materials (educational films, slides, self-instructional programs). What is urgently needed in order to evaluate faculty and programs in cost-benefit terms is a detailed recording of the amounts of all resources that go into any instructional effort. And, if the notorious unreliability of retrospective data is to be avoided, this implies the necessity of undertaking diary studies of representative samples of students and faculty to determine how much of their time is actually being devoted to some kind of instructional activity, the exact nature of that activity and the way in which the quantity and distribution of such activities change with different instructional method-ologies. Secondly, it suggests the importance of the increased costs of laboratories, hospitals and other clinical facilities attributable to using patients as "teaching material."

The model described above goes far beyond those currently employed in

most settings. However, tedious as it may be, even it is incomplete where
the goals of a program include immediate improvement and/or expansion of
direct patient care services. In those community-based programs which have
been established to provide health services to an underserved area, it
is obviously necessary to document the changes, if any, in the amount and
quality of care available to the public, and to consider the changes in
aggregating the program product.

In short, it is proposed that both program and teacher effectiveness
can be judged only after the costs are documented and charged both against
the desired changes in student knowledge, judgment, skills, habits and
attitudes which are realized, and against the potential and real improve-
ments in the quality of health care delivered. Three types of data are
therefore indispensable in focusing in output variables: that derived from
comprehensive measures of relevant aspects of student performance, that
available form systematic quality assessment of health care and that obtained
from careful cost accounting of teacher and student time expended, of other
resources consumed and of undesired side effects induced by the educational
interventions.

Methodological Considerations in Applying the Model

Employment of the model outlined above in the development of an
educational evaluation system requires brief attention to two additional
sets of issues: first, technical issues relating to methods of collecting
data on input, process and output; and second, philosophic issues concerned
with the nature of the criteria to be used in decisions relating to the
counseling and disposition of students, faculty and programs.

Sources of Data. With respect to the first, provision needs to be made

for utilizing three types of data sources: one, perceptions of participants

in the educational program; two, systematic observations (using the term

in its technical sense to include all types of objective measurements)

of inputs, process and product; and three, various kinds of analyses based

on appropriate manipulation of the measurements.

Nature of Criteria. Discussion of the technical issues noted above

still leaves unresolved certain philosophic issues in using this or any

other model in any educational evaluation. Of particular significance is a

consideration of the nature of the criteria to be employed in making the

required decisions. Questions requiring decisions will sometimes be posed

in the form "Is X better or worse than Y?" Other times they take the form:

"Is X good enough?" In short, for certain decisions it will be necessary

to use relative criteria and the data on which those decisions are based

must be adequate to distinguish better from worse. For other decisions it

will be necessary to apply absolute criteria in determining whether or not

X--i.e., a student, a faculty member or a program--meets pre-determined

standards, irrespective of its position relative to A, B, and C. Under

these circumstances the data must be sufficiently comprehensive, relevant

and reliable to justify that difficult judgment without reference to actually

existing alternatives.

Application of the Model to Evaluation of Community-Based Independent Study Programs

This discussion was initiated with the assertion that, aside from

certain technical and logistical problems, an evaluation system suitable

for use in community-based independent study programs would not differ in

principle from an evaluation system appropriate for any other educational

enterprise. However, aspects of that model assume increasing significance

in community-based independent study programs. In the discussion which
follows these issues are futher elaborated.

Specifying the Purpose of the Evaluation

As discussed above, the general purposes which an evaluation system
must serve are identical in both conventional and non-traditional programs:
to facilitate the making of more informed decisions about students, faculty
and programs. However, the specific matters on which decisions will need
to be made about each of these "objects" of evaluation, and the relative
weight of particular considerations will vary with the nature and goals of
each program.

Student Evaluation. In programs in which the emphasis is on independent
study, the evaluation of students presents cretain challenges not necessarily
characteristic of student evaluation in other types of programs. For
example, recent research on the implications of variable student attitudes,
values and personality with respect to the demands placed on the educational
environment has special significance for the selection of students in an
independent study program. In this work student characteristics are
regarded as unconscious demands on the environment and environment is
viewed as presenting an assortment of expectations and activities, pressures
and rewards, facilities and people, all of which require some kind of
adaptive response from the student. Student performance is seen as a
function of the congruence between the student's unconscious needs and the
potentially conflictful demands of the environment. Research in this field
has been dedicated primarily to the purpose of testing this hypothesis.
Though the expected relationship between personality needs and environmental
demands has not been empirically demonstrated as fully as had been hoped, it
has been clearly shown that students who elect an independent study program

differ from their colleagues who choose a more traditional program.
Further, the fact that the two educational environments also differ greatly
has been fully documented, and it has been clearly shown that what happens
to students does depend in some measure on the particular character of the
environment. However, the influence of different patterns of environmental
press on different patterns of personality need is exceedingly complex and
its implications for student selection, educational planning and decision-
making are far from obvious. What is obvious is the need for increased
attention to these matters, particularly in student evaluation for purposes
of selection into non-traditional programs.

Similarly, while monitoring student progress for purposes of counseling
students is exceedingly important in any educational program, student
evaluation for this purpose is critical in an independent study program.
Such a program requires first that the optimal learning mode and/or sequence
be estimated for each student and that careful guidance be given to students
in selecting the strategies most effective for each. It further requires
that an effective system of placing students into the program and selecting
not only the point of entry but also the sequencing of experiences must be
developed. Finally, flexible pacing of instruction also requires a means
of verifying readiness for the next unit of instruction. This entails the
collection of detailed information which will support the counseling and ad-
vising functions necessary to insure that students make reasonable progress.
In short, a well-designed evaluation system for monitoring student progress
is an indispensable ingredient of any independent study program, whether it
be community or university based.

In this connection recent research on "mastery learning"* may be of special significance in the evaluation of students in independent study programs. Specifically, educators have long known that student achievement in any area falls into a normal distribution curve. They have also repeatedly demonstrated that these individual differences in both level of attainment and rate of learning are actually exacerbated over time in conventional, fixed, rigidly scheduled curricula. However, some studies suggest that in "mastery learning" settings, where each student is allowed to spend as much time as he or she requires in mastering the initial curriculum units, differences in the levels of mastery as well as differences in the amount of time required to reach a given level of achievement are progressively diminished in subsequent units, and, under optimal circumstances, may even disappear altogether.

The finding that there is a progressive diminution in the differences between students with respect both to achievement and to the time required to reach mastery, when instructional units are appropriately sequenced and when each student is given sufficient time and resources to master the initial units, has implications not only for the counseling of students in independent study programs, but also for the general design of programs and for resource allocation within and among programs. Specifically, it implies nothing less than the total reorganization of medical education, and its associated instructional strategies, to be replaced by a completely individualized program based on scientific educational diagnosis and prescription analogous to the process of individual diagnosis and prescription

---

*The term, mastery learning is generally used to refer to those educational programs in which students are permitted to enter at that point most suited to their prior achievement, are required to spend as long as necessary on each unit of instruction in order to master it, and are moved through the series of units at whatever pace each individual rate of learning permits.

characteristic of clinical medicine. Followed to its logical conclusion,
this line of reasoning requires schools to make a rational assessment that
helps to answer the difficult socio-economic issue touched on above,
namely: Whom can society afford to educate and to what level of mas-
tery, in order to make the maximally cost-effective contribution to the
health care needs of our society?

Faculty Evaluation. In community-based independent study programs both
the persons who are included in the faculty, and the particular attributes
of faculty members which are most prized may differ from those similarly
regarded in more traditional programs. For purposes of faculty evaluation
in the former type of situation it may be necessary and desirable to place
relatively greater emphasis on an individual's total contribution to the
design and implementation of the educational program than on his or her
teaching skills per se. Such a focus will, of necessity, introduce pro-
blems of data collection and data interpretation that are more difficult to
resolve than occur in the evaluation of formal teaching. Finally, while a
broader spectrum of activities may need to be considered in planning for
the evaluation of the overall faculty in a community-based independent
study program, the basis on which each individual is assessed may need to
be more narrowly defined in light of the limitations placed on the individual
by his or her unique role in the system. Finally, for purposes of counseling
faculty, special attention will need to be given to the varied roles
which faculty may play in a non-traditional system, and thus special tech-
niques may need to be developed for alerting and assigning individual
faculty members to the most appropriate opportunities and responsibilities.

Program Evaluation. In those community-based independent study programs

that have been developed primarily for purposes of improving the quality of the educational product, the determination of educational needs is simply the reverse image of the process discussed above in connection with student counseling for purposes of placement and monitoring student progress. However, the very nature of the selection process in assigning students to independent study programs introduces a number of technical complications in attempting to assess program effectiveness. So long as efforts are limited to comparisons between the new programs and the more traditional ones, program evaluation is likely to yield the same kinds of inconclusive and conflicting results that "experimental-control" type studies of other instructional strategies have produced. What is probably most needed here is a research design which identifies the relative effectiveness of different kinds of instructional strategies for different kinds of students. Once these data are available, it is theoretically possible to construct functions, which represent the interaction of student characteristics and program characteristics, that can be used to advise students in a manner that will optimize the match.

In programs where independent study and community resources are introduced primarily as strategies to lower educational costs and/or to expand educational opportunity, the focus of program evlauation will necessarily be on cost effectiveness. Specifically, data collected will need to be responsive to such questions as: How much, if any, have per student costs been lowered, at what, if any, sacrifice in the quality of gradutes?

Finally, in those community-based programs that have been developed primarily for purposes of increasing the health services available to underserved populations, program evaluation will obviously need to be designed so

as to obtain responsible evidence about changes in the distribution and

in the quantity and/or quality of such services. To be maximally useful this

evidence will need to include epidemiological data relevant to the impact

of the program on community health, and cost data regarding the relative

long-run costs of alternative methods of meeting health care needs.

Determining What Is To Be Measured

The purpose to be served in establishing a new program, the hypotheses

to be tested, and the decisions to be made will, of course, determine the

specific variables on which it is most urgent to gather data.

Input Variables. If the major emphasis in a new program is placed on

independent learning, then data about certain student characteristics will

assume special importance. Specifically, their readiness to assume primary

responsibility for their own learning will need to be assessed. If, on the

other hand, the community setting is the critical element in the program,

the nature and structure of community educational and health resources will

need to be documented. Finally, if provision of expanded community service

is the primary reason for establishing a program, careful attention will need

to be given to cost allocation.

Process Variables. Since there may be great differences between the

plans for, and the implementation of, a program, data about the educational

process are useful in documenting what actually occurs. Further, since the

rationale for introducing non-traditional programs is often based on

assumptions about the optimal conditions for learning that differ from those

underlying more conventional programs, it might appear that the process

variables on which data are to be sought would also differ. However, such

is not the case. In both settings it is important to know exactly what the

students did and how each individual utilized them. Thus, except for purely

logistical problems in gathering and summarizing information about the varied

conditions of learning for different students in a community-based inde-

pendent study program, the elements to be measured in the educational process,

and the techniques of gathering data on each, are completely analogous

to those employed in a more conventional setting.

Product Variables. Surely, the basic knowledge, skills, habits and

attitudes which are essential to the practice of medicine and which constitute

broad institutional goals will be common to both the community-based indepen-

dent study program and the traditional program of a particular institution.

Thus, that part of the evaluation system which is addressed to assessing

educational outcomes will be concerned with measuring essentially the same

variables, irrespective of the nature of the program. However, if it is

true that students learn more, learn it more efficiently and retain it

longer when they are actively involved in the learning process, one could

hypothesize that independent study programs should compare favorably with

the more traditional programs on these dimensions. In addition, specific

hypotheses regarding the anticipated differences in the habits and attitudes

of independent study students could be profitably investigated. For example,

to the extent that self-assessment for purposes of monitoring one's own pro-

gress is an essential aspect of the independent study program, it would seem

to follow that students in that program could be expected to develop both

increased motivation and increased skill in this important professional

attribute. Similarly, one might anticipate that extended experience in

directing one's own learning would be associated with the development of

attitudes toward, and skills in, continued learning following the completion

of formal training. In addition to individual learning, there are certain

long-term program outcomes--both direct and indirect--which cannot be neglected,

particularly in the evaluation of some newer types of programs. Specifically,

given the goals of community-based programs, it would seem to be essential

to conduct follow-up studies of students in order to determine the extent to

which career choices of graduates of these programs differ from those of

graduates of more traditional programs. Secondly, the evidence is mounting

that community-based programs may have immediate and positive effects on

the geographic distriubtion of health professionals and on the quality of

care they deliver. Specifically, information is becoming available which

suggests that the presence of medical students in community settings,

particularly in rural settings, reduces the feelings of isolation of pro-

fessionals practicing there and may encourage both those already located

to remain in, and others to move to, such areas. Whether the establishment

of educational programs in such settings does, in fact, have such an effect

on manpower distribution, there is some reason to believe that, depending

on their professional maturity the presence of students in a health care

setting increases the quantity of care available and elevates the quality of

that rendered. However, the conditions requisite for maximizing the pro-

bability of this type of outcome need to be investigated.

Defining Each In Operational Terms

Once it is determined what educational products and what educational

processes are to be measured it is necessary to define each variable in

operational terms. The procedure for doing this in evaluating newer types

of programs does not differ from that for any conventional program. To the

extent that a community-based independent study program represents merely

a different instructional strategy for achieving the same objectives, the

operational definition of the latter will be the same for both conventional

and non-traditional programs. In this connection it should be stressed that in student evaluation for purposes of certification or licensure, the same definition of competence will apply to all students irrespective of the content and strategies that define their respective programs.

Devising Appropriate Data Collection Instruments

The evaluation of the educational outcomes of any program requires systematic and reliable assessment of performance in both "real-life" situations and relevant "test" situations. While there are always problems in obtaining reliable observations of "on-the-job" performance, these difficulties may be greatly exacerbated in community-based programs, due to the increased number of observers, the possible lack of consensus among them regarding criteria, and the greater variation in the settings in which observations are made. In short, the very nature of community-based independent study programs creates obstacles to utilizing observations of real-life performance--whether these are based on audits of the clinical records the student produces or on direct observations in office and hospital settings. Given the potential for variation in such settings and the different situational constraints these variations create, the validity and reliability of such observational data may be called into question. For this reason it is advisable to consider placing greater reliance on newer and potentially more valid forms of tests, in evaluating the products of innovative programs. For example, recent research on various types of simulation suggest that by employing this technique, the most varied types of individual patient and/or community health problems can be made readily available in realistic form for purposes either of instruction or evaluation. Such a technique would appear to be particularly valuable for valid and reliable assessment of students

studying in diverse settings.

Similarly, in the evaluation of the educational process, systematic collection of relevant student reactions presents no greater difficulty in community-based independent study programs than in more conventional ones. However, systematic and reliable observations of the instructional materials and strategies actually employed, and of student interractions with these strategies present serious logistical problems.

Collecting the Data

Clearly adequate provision must be made for reliable documentation of observations of performance, objective auditing of charts and records, and accurate recording of student and faculty responses to tests, questionnaires, rating forms and the like. But that is not enough. In designing any evaluation--whether it be of students, faculty or programs--it is essential to determine in advance who is to respond and/or be observed, the timing of those responses and observations, and the conditions under which they are to be made. These determinations become especially troublesome in any independent study program and especially in one which is community-based, given the potential variability in both the programs which students follow and the conditions under which they pursue them. Definitions in terms of calendar time and common settings may be useless; rather, it may be necessary to define both time and setting in relation to each individual student's location with respect to some common end-point.

Setting Standards

As discussed above, the decisions that will need to be made about individual student or faculty, and about programs can be couched as answers

to one of two questions: "Is X better or worse than Y?"--which implies

that standards be set in relative terms, or "Is X good enough, irrespective

of Y?"--which implies comparison with an external criterion and, thus, and

absolute standard. It has long been my view that in the evaluation of pro-

fessional students only the latter is acceptable. The rationale for this

view is strengthened in any independent study program. On the other hand,

because programs involve resource allocation among competing demands, a

relative standard would seem most apprppriate for evaluating programs,

provided that standard is appropriately stated as follows: "How much better

or worse is X than Y, for whom, under what conditions, and what costs?"

This form of stating the question suggests a very different kind of evaluation

design from that encountered in the usual experimental-control studies, so

often proposed for program evaluation.

In this connection two brief observations may be relevant. First,

even the most careful designs which attempt to "control" for different stu-

dent input* have been vitiated by inevitable "contamination" of the control

population. While this may be satisfying from the point of view of the

educational impact of the new program, it makes generalization from the results

especially hazardous.** Secondly, designs for analyzing the costs of alternate

programs have all too often neglected to document all types of costs and have

failed to allocate the overhead for program change adequately. Indeed, in a

most recent (as yet unpublished study) the investigators came to the unexpected

*Illustrative of such "careful" designs are those in which student volunteers
are invited to the experimental program, and half of those volunteering are
selected by random means for acceptance into the program. Such a research
design premits comparison of the experimental group with both a volunteer
control group and a non-volunteer control group.

**For example, see Ohio State, Study of Pilot School.

finding that while per student costs for materials and facilities were significantly lower, despite the fact, that independent study students had the illusion that the contact with faculty was far greater. Though admittedly a small scale study of a local situation, these findings, if substantiated in other studies, have significant implications for assessing cost-benefit.

Summarizing and Reporting Results

Clearly in planning any evaluation study it is necessary to consider the groups to whom reports are to be made, i.e., the students, administrators, program planners, instructional staff, and, in some instances, the local or national health service. Further, the form in which each report is to be made is critical: Should it be in the form of an overall comparison with the standard selected? Or as a detailed profile of individual or program strengths or weaknesses? An/or as a cost-benefit analysis? While these general considerations in reporting evaluation data for unconventional programs do not differ from those entailed in reporting any other evaluation data there may be problems of confidentiality involved in reports dealing with independent study students. Specifically, recent legislation imposes some severe restraints on the collection and reporting of any individual data. These restraints would appear to be especially serious in analyzing data from independent study programs, simply because such data are not readily interpretable in the absence of information about individual characteristics. Both program administrators and researchers are currently exploring federal guidelines in this regard and must, of necessity develop appropriate local procedures.

Summary

In what has necessarily been a very general discussion of the requirements for educational evaluation and requisite support systems appropriate to community-based independent study programs, three considerations need to be highlighted: first, there is the matter of the careful definition of programs that belong to the class under consideration. If the emphasis is to be on community-based programs then special consideration needs to be given to the impact of these programs on the health care sytsem, in assessing their total worth. Secondly, to the extent that emphasis is placed on the individualized aspects of truly independent study, then special consideration must be given to the logistical problems of appropriate data collection on the one hand, and to the hypothesized long-term effects of professional habits and attitudes on the other. Finally, both the setting and the nature of the instructional strategy implied by the term "community-based independent study programs" present special considerations and require special treatment in collecting and interpreting data about both the product and the process, and the costs of obtaining or implementing them.

DISCUSSION AND CLARIFICATION OF PROFESSOR McGUIRE'S PAPER

Discussion Point

DR. TRZEBIATOWSKI: Through all experimental research it seems to me, Christine, that you have pretty well eliminated the static traditional experimental research model in favor of the more dynamic evaluation models.

DR. McGUIRE: I hope so because I join with the former president of the American Education Research Association who said, and I may be exaggerating his quote slightly, something to the effect that the application of the experimental control designs and analysis of variance techniques had done more damage in education than any other concept, fad, or theory that had ever been introduced to education.

Discussion Point: Cost vs. Effectiveness

DR. PIMENTA: I am concerned with the problem of cost effectiveness. It's difficult enough in traditional programs, but in nontraditional programs how does one decide what is a legitimate cost and what is effectiveness?

DR. McGUIRE: I must agree with you that this is a problem in any kind of evaluation, and I think that traditionally we have probably looked at the least relevant costs because they were the easiest to measure, for example, the cost of a new lecture hall, the cost equipping it, and the cost of producing software for some particular instructional system. These are costs that we can easily determine, but what we don't have are costs in terms of faculty and student effort. I think we are going to have to do some work with diary studies. A fascinating paper has come to my attention, although it is not yet published, which seems to indicate that independent study programs, that although are appearing to be more expensive in terms of faculty

time, are actually lower in cost off faculty time per student for the independent study student in the particular program understudied than the cost of faculty time in the conventional program. In this case, they had simply literally done some varied studies calculating what the faculty were doing into it and yet the perception of the students was that they were getting more faculty time, that is the independent study students, than the conventional students. I can't fully answer your question. I think it's a matter of our beginning to do what the business world found out how to do reasonably well.

Discussion Point: What Outcome Should be Measured?

DR. BRYANT: Professor McGuire, you included among your parameters to be measured social outcome. Would one of these be student career choice of geographic location and specialty? If this is the case, how do you handle the problem multiple-determinants of outcomes? For example, career choices, only some of which are the results of the educational program.

PROFESSOR McGUIRE: I suppose you just manipulate these factors over which you have some control or to tip the odds a little bit more in your favor, that's all you can do, yes of course. I thank you for reminding me. I would certainly add as an essential evaluation of these programs, as of any other, follow-up studies of the graduates to determine long-term career choices on location of practice. Again, I think the hypothesis is that students going through community-based programs will be more likely to settle in underserved areas. I'm not sure that hypothesis is going to be borne out. It may be that some students are in such an unfamiliar environment that they become even more repelled by some of these settings. I think we've got to be very careful about both the short-term and long-term impact on these students.

Discussion Point: Evaluation of Objectives vs. Measurement of Objectives.

DR. FULOP: I feel that there is a need to both evaluate and measure

objectives, first of all from the point of view of relevance. We now have

the technologies to define objectives which are just as irrelevant as pre-

vious content was without objectives, but we are very proud that the ob-

jectives that we have, although they may be irrelevant, have been defined

according to all the rules of defining objectives.

DR. McGUIRE: I would agree this would have been better had I made explicit

objectives in evaluation tools. I must admit that I constantly subsumed

evaluation objectives under content because I don't mean just subject

matter content but what the program elements are all about. I also con-

stantly subsumed evaluation tools under materials, but then I forget to

make that explicit, and therefore I appreciate your comment.

Discussion Point: Practice Location

DR. GUTIERREZ: The problem of sending students to work with physicians in

small community clinics could play an important role in helping a physician

decide where he should finally locate his practice. There are many other

determining factors, however. Although the students in Puerto Rico and

Costa Rica all have community experiences, only six out of 386 graduates are

currently practicing in rural areas. This shows that there are other

determinants more important than simple experience in the community. One of

the major problems is an economic one.

Discussion Point: Choice of Outcome Variables to be Measured

DR. LOBO: I doubt whether the variables you said to measure in traditional

educational terms are adequate. I think that if we are educating people to
be incorporated in health care delivery systems we should measure the
efficiency of the educational process itself by the improvements and the
results of health care delivery to people. We know that this is done through
activities, functions of these people, and the health care system. They are
developing functions to meet certain requirements, and we should define
criteria in each situation to determine whether these functions have been
successfully carried out. To measure traditional educational components such
as knowledge, skills, and attitudes, are quite inadequate when we are con-
cerned about their capacity to function and to achieve the health care delivery
criteria that we have established.

PROFESSOR McGUIRE: I agree with you. Perhaps I can amply on the situation
by using an analogy. When we are looking at the educational outcomes that
we say these components, knowledge, skills, habits, and attitudes, we are
really looking at process variables. Let me make the analogy to assessment
of the quality of health care. You can, for example, set up a criteria that
anyone who comes into a health care clinic with chest pains should have a chest
X-ray. You can also then measure and see how many people who come into the
clinic actually do get X-rayed. That's a process variable in my mind. But
what you really want to know is have the health problems in that population
been diminished. Very often we find in looking at health care as in looking
at educational outcomes we have difficulty in getting at the real outcome
variable and so we are forced back to deal with some of these process variables
just as a way of getting some reliable data. I would fully agree with the
implications of your comment that it is up to us in our role as educators
and physicians either to quit using these process variables or to try to
establish what the real link is between the process variable and the real

outcome which we wish to have information about. I think these questions

suggest a serious looking at the quality of health care as they are a

quality of education.

DR. LOBO: I don't believe we should speak about the quality of care because

quality is also an assumption. We should speak about the results of care.

Discussion Point: Location of Practice and National Health Policy

DR. MEYER: It is our experience with the study of our students who have

had community experiences for over forty years that three-month community

experience served as a negative factor in determining where they should locate.

That is, it turned many of them off to practice in rural areas. We must be

very careful that short-term community-based experiences taken out of a total

Flexnerian model of education may have a reverse effect of what we desire.

DR. McGUIRE: That's right. The student may be perfectly inoculated against

service in that kind of area.

DR. BRYANT: I recognize that past data seems to hold up to enforce the

hypothesis that student practice location is dependent upon residency,

location of residency, and family ties. I wonder if we are not in a new

situation now in which there are some apparently strong trends in the

United States towards primary care and towards serving some of the under-

served populations that could not be explained simply on the basis of where

the residency location was. I raise the point in order to call attention to

what I consider to be a crucial issue in influencing decisions about medical

graduates and I would say also then influencing their motivation to learn

certain subjects within a medical school and that is that society is saying

about the directions which young physicians should be going. There is no

doubt that in the United States there has been initiated as a matter of
national purpose the need to provide better care for the underserved
populations. This has been expressed in the national legislation; it has
been expressed in changing medical school curricula; and some of the community-
based programs that are reflected here are part of that expression. I
raise that in addition because I think it is important for all of us who
are interested in medical education around the world to appreciate the im-
portance of national policy relating to health care in medical education, and
in those instances in which there is no such strong feeling of national
purpose in the care populations in need, then it is going to be very
difficult for the medical schools alone to achieve changes in the desired
direction.

DR. McGUIRE: It also helps in that strong sense of national purpose if it
is backed up by flow of financial resources to encourage medical schools to
be more and more interested in primary care and serving underserved
populations.

INTRODUCTION TO PAPER BY DR. JASON

Dr. Jason facilitated the work of the conference by contributing a very excellent paper which defined the teacher's role in the instructional process especially as faculty relate to independent study programs. He begins by defining instruction as that process which helps others to grow in a desirable direction and/or at a rate that would not have happened otherwise. He states that there are four major ways in which a teacher can influence or shape the direction and rate of growth of students. These four factors are in: student selection, the evaluation of students, serving as effective role models and the actual teaching of students.

Student selection is an extremely important process because if you wish to have graduates of a particular program exhibit a certain set of characteristics, then the simplest and best way of assuring this is that students be selected which already exhibit these characteristics. Faculty members during the evaluation process, consciously or unconsciously, are actively involved in the shaping of students' study efforts and, therefore, the outcome of the graduates of any particular program including independent study programs. The teacher's stance toward evaluation of students and the climate they create relative to evaluation has many potential, both positive and negative, effects on students. Faculty members serve as role models which deal with the subleties of the complex human performance as it is embodied in becoming an effective physician. Teachers in independent study programs have a special responsibility to assure that the program includes substantial exposure to relevant meaningful models who exhibit the behaviors and characteristics that the students will need themselves in professional work. During the actual teaching of students paradoxically the form of potential influence on the development of students which is given the most attention from teachers is probably the least potent of all.

He goes on to point out that the role of the teacher in the independent study program is less directive, less authoritative, and even less visable than is the conventional teacher's role.

THE TEACHER'S ROLE IN INDEPENDENT STUDY PROGRAMS
By Dr. Hilliard Jason

Instruction is (or should be) the process of helping others to grow,

in a desirable direction, and/or at a rate, that would not have happened

otherwise. The particular responsiblities and roles of instructors in any

educational program are a function of several factors, of which the following

three are particularly important: 1) the characteristics of the students,

2) the goals of the educational program, and 3) the organizational structure

of the program. The specification that an educational program is to be

built around "independent study" accounts for item (3) above. An examination

of the instructor's special responsibilities in a program of independent

study requires consideration of factors (1) and (2) as well. The best way

to understand the teacher's role in relation to these issues is in the con-

text of a discussion of the ways in which instructors generally can contribute

to the growth (i.e., learning) of students.

Instructional Impact

There are at least four major ways in which instructors can poten-

tially influence or shape the direction and/or rate of growth (acquisition

of competencies) of their students. These four factors, and some of the

implications for the special circumstances of a program of independent

study, will be examined in turn.

a) Student Selection. In simplest terms, the best way of being

certain that graduates of a program will have particular characteristics is

to assure that those admitted to the program already have these character-

istics. This is not a facetious observation; it is a practical and impor-

tant aspect of educational planning. If, for example, we want people to be

sensitively concerned about the feelings of other people, it is far more

effective to select among applicants on the basis of their possession of
these characteristics than to hope to cause the emergence of such character-
istics in people who were not selected on that basis, and, therefore, may
or may not have an inclination in that direction. Similarly, if it is
intended that the graduates of an educational program will be effective
continuing learners throughout their professional career, it is far more
efficient to select people for entry into that program who have already
exhibited positive attitudes toward, and skill at, independent learning than
it is to try and foster those attitudes/characteristics later. It is here
that we can perceive the complexity of a discussion of faculty responsibility
in independent study programs.

There are two possible major reasons why we might decide to have
programs of independent study in the first place: 1) because we believe
that this is a more efficient way to learn all aspects of medicine, and 2)
because we believe that the process of learning independently will be
facilitative of the development of self-learning skills, which will be
needed later in the pursuit of their professional careers. If the latter
is the case, then it follows that a central responsiblity of teachers in an
independent study program is to assure that incoming students are already
predisposed to (have an aptitude for) effective self-learning, as a meaning-
ful component of assuring that they will have those needed competencies
later. Indeed, if continuing self-learning is regarded as an important
professional characteristic, then this needs to be a selection criterion in
anticipation of any educational program, whether conventional or involving
independent study.

b) The Evaluation of Students. Once students have been selected to
enter an educational program it is clear that the most potent influence on

the characteristics they acquire and the type of graduates they become is

the evaluation system to which they are subjected. Those things that are

emphasized or neglected by the evaluation system shape the direction of the

efforts invested by the students. In addition, the "climiate" of the evalu-

ation system has potent effects on a variety of fundamental attributes and

attitudes. For example, an evaluation program that fosters competition among

students (as do conventional evaluation systems that are built around

"grading on a curve" and predetermining the number of high grades that will

be distributed) works actively against any intention the program might have

of fostering an attitude of cooperation and collaboration, as a basis for

future effective work as members of professional teams. Similarly, an

evaluation system that causes students to feel they are in jeopardy,

causes them to become very self-protective and to conceal the existence of

any confusion, bewilderment, or inadequacy; when, in fact, effective learning

depends upon comfortably revealing the existence of these problems, so that

appropriate assistance can be sought and provided. These principles, and

their implications for faculty member's responsibilities, apply equally to

conventional and independent study educational programs. The independent study

program tends to appear to define the faculty member role somewhat differently,

through its emphasis on the particular characteristics of individuals, and

the consequent concern that evaluation be effective in identifying that

individual's strengths and deficiencies. The fact that teachers in con-

ventional programs tend not to be as concerned about these issues in no way

justifies such behavior; they should be just as concerned about individuals

and accurate evaluation of their students if they want learning to be effec-

tive. Again, teachers in both domains need to be concerned about the

"climate" and potential side effects of the evaluation system if they are

to achieve the goals they usually specify for their program.

c) <u>The Effect of Role Models.</u> It is impossible to summarize merely with words all the subtleties of such complex human performance as is embodied in becoming an effective physician. Yet, people who are to learn these complex skills and acquire this wide range of difficult/unusual characteristics must have some basis for conceptualizing the directions in which they are supposed to be moving; the ways in which they are to evolve and change. The process whereby this happens is what we call "modelling." It is the process whereby an individual perceives representatives of the roles and characteristics he/she might adopt, and formulates a notion of the directions in which to move. In other words, to become professionals, we need professional role models to emulate. Without such models, students often find themselves feeling that they are engaged in hollow, irrelevant tasks, which they will pursue for purposes of passing examinations, but which are not meaningful to them; they are unable to perceive how these experiences relate to what they themselves are in the process of becoming. "Learning," under such conditions is very short-lived, at best.

Again, these considerations are equally relevant in conventional and independent study programs. In fact, this is an issue that is a special problem for both such programs, although in different ways. In conventional programs, the student often has exposure to a substantial array of models, although many of them turn out to be inappropriate ones. Medical students, that are typically in the process of preparing to become community-based practitioners, are not especially helped by being exposed primarily or exclusively to laboratory researchers or institutionally based sub-specialists, the two main models that tend to populate the full-time faculty of medical schools. On the other hand, independent study students often find

themselves working primarily or exclusively with books, self-instructional units, or computer terminals, all of which might be elegantly designed to attend to the students' cognitive needs, but which fail completely to provide any of the necessary modelling. Teachers in independent study programs have a special responsibility to assure that the program includes substantial exposure to relevant, meaningful models who exhibit the behaviors and characteristics that the students themselves will need in the professional work they will ultimately do.

d) The Teaching of Students. Paradoxically, that form of potential influence on the development of students which gets the most attention from teachers, is probably the least potent of all. The actual conduct of what we call teaching or instruction, such as offering lectures, conducting seminars, or supervising in clinics or laboratories are all activities in which teachers engage, but which have distinctly limited value in effecting meaningful change in people. Ultimately, learning is a private process; people must do their own learning. The main thing that happens in most classrooms is that the students extract from the transactions some sense of what the teacher considers important, so that they can know what to study (learn) when they have time to pursue those issues further. It is here that we see the most striking difference between the roles/responsibilities that teachers tend to take on in conventional educational programs, as contrasted with those they should assume in well designed independent study programs.

The critical point is that the teacher's role is not automatically dictated or defined by the organizational characteristics of the program. Indeed, in many ways, it should be the other way around. Only if a given teacher sees his/her responsibility as being a facilitator of the independent

growth of students, rather than as a purveyor of knowledge, should an independent study program be offered. And then, the specific roles/responsibilities of the teacher in the independent study program are really those of the teacher that wants to be effective, in any program.

The simplest way to characterize the teacher in a program of independent study is to draw an analogy to the role of the "consultant."

A central feature of the thinking/behavior of consultants is that their "clients" (patients/other doctors/students), not they themselves, are the ones who are responsible for the issue at hand (making decisions, accepting or rejecting advice, learning). This distinction is critical. Most teachers, in most conventional educational programs, behave as though it was they, not the students, that were ultimately responsible for the learning their students must do. They work out the students' schedules for them, they assign reading materials, they plan the laboratory tasks that are to be pursued, and they "tell" the students what is and is not important. Most particularly, they presume to know in advance, how many days or weeks each student should devote to learning that material. Understand, it is possible for teachers to behave this way in programs of independent study also; it is just totally contradictory if they do.

If they adopt, as they should, the role of the "consultant," they provide materials and opportunities, they are available to respond to questions, and they help students to understand and value the goals of the program, but they stay out of the student's way when they are not needed. In fact, in the ultimate form of the independent study program, they don't even design the examinations for the students. They do help specify the competencies that the students will need to demonstrate, but they leave it to the students to devise ways of demonstrating that they have in fact acquired

what they need. The premise is: if students have the opportunity to participate in specifying their own goals, and to determine how the goals are to be achieved and demonstrated, they are far more likely to value the learning they have pursued, and to sustain that learning, than if these things were done for them.

Clearly, the role of the teacher in the independent study program is less directive, less authoritative, and even less visible than is the conventional teacher's role. For some it would, therefore, be less satisfying. But that introduces a critical question: should the teacher's satisfaction come from engaging in dramatic, visible, self-fulfilling tasks, or from the quiet assurance of knowing they have been truly helpful to someone else's growth?

Hopefully, more and more medical teachers will decide that it is the latter that they prefer.

DISCUSSION AND CLARIFICATION OF DR. JASON'S PAPER

Discussion Point: The Possibility of a Non-competitive Climate for Evaluation

DR. YEPEZ: When you were discussing evaluation you talked about the impor-
tance of creating a pleasant climate or atmosphere. Would you amplify this
point with an example of how independent studies can contribute to overcome
the spirit of competition among students and how a more pleasant evaluation
environment can be created.

DR. JASON: Thank you.   I think that your question might be one of the most
fundamental issues in all of medical education.   Yesterday Professor McGuire
and others introduced the idea of mastery learning or criterion referenced
evaluation.   Although these technical terms are not important, the important
concept behind them is that when dealing with students we are focusing, not
on which student is better than which other student, but we are focusing
on "what particular skills, attributes, competencies, knowledge levels, and
understandings to we want the students to achieve?" If these skills, com-
petencies, and knowledge levels are stated as part of the goals of the program,
the student is then working towards achieving the goals of the program in-
stead of against the teachers or against the other students.   The general
atmosphere becomes one of students and teachers working together to help each
individual learn as much as possible of the array of requirements spelled
out in the goals of the program.   To create this environment involves changing
some basic procedural characteristics about our evaluation system.   It
involves eliminating things like grading on the curve where we decide in
advance as if we had the wisdom to know before we met our students how many
of them are going to do well and how many of them are going to do poorly

independently of how well we teach or how diligent they are in their studies.
The whole psychology behind grading on the curve has been extremely des-
tructive and has promoted competition and created a difficult attitude be-
tween teachers and students. The situation still exists in many institutions.
It is possible to create a positive evaluation system. I can assure you of
this from a good deal of personal experience and from the experience of
schools that have done away with those kinds of old fasioned grading
systems. Some schools have eliminated the word "fail" from their voca-
bulary. Teaching is the only sphere of human relationships where we pre-
sume to be helpful when we go out of our way to hurt our clients, those we
are supposed to be helping. There is no reason to help fail somebody when
an individual does not achieve his expectations or the institution's
expectations. They should be counselled into another line of work. To
label them as a failure is unnecessary and something that I regard as very
destructive psychologically. Some schools use a system of credit vs. no credit.
The student either has met the requirements to receive the credit or he has
not. In order to receive credit the student may require more study time or
more skilled teachers. This system acknowledges that it is not always the
student's fault. It may be the fault of the teacher, the curriculum, or
the instructional program. It takes time to establish a system such as this
so that both students and faculty trust and believe in the program. Some-
times it takes many months and even years for everybody to believe in it.
I can only offer that I am convinced that it is worth it.

DR. SMALL: I would also like to try to answer your question. At our school
we are trying to achieve an intermediate position between that which exists
with highly competitive students seeking a grade for himself and the goals

that Dr. Jason sets for a non-competitive evaluation environment. The

intermediate position that we are trying to develop is not only to eliminate

competition but eliminating the goal of that competition. More specifically,

we are trying to get the student to compete not for a grade but for the

ability to help one another so that we can give our rewards and our grades,

in part, based on how well they get a helping score, a score that directly

measures how effective they are in helping one another learn. This helping

score is totally independent of the grade they normally would earn. This is

the immediate need. It does seem to help to change the student behavior

although I cannot completely document it except with anecdotes.

DR. LOBO: I would like to comment about the problem of competition among the

students and the role of the evaluation system in controlling this competition.

I think that we should get out of the credit awarding business and do away

with the grading system as well. We should have, instead, well established,

well discussed criteria. If we do not, our evaluation will be of doubtful,

solidarity. This criteria should be based on performance as I stressed in

my paper yesterday. My experience has been very good in using students as

tutors of other students. Students teaching other students creates a

climate of favorable interaction among them and thus avoiding those aspects

of competition which are negative. I think this is one of the important

things we could do more of (i.e., use the students to help other students

as part of the teaching system itself).

PROFESSOR McGUIRE: I want to make one comment and ask a couple of dreadful

questions. The first comment has to do with our discussion of making

evaluation more comfortable, more pleasant, and less competitive. You will

notice one word that we haven't mentioned here that I think needs to be

mentioned. It is not sufficient that we need to eliminate grading on the

curve. We need to eliminate trying to rank people as overall better or
worse than each other. We need to eliminate from our vocabulary and our
practice the ranking of people. If I may go on, Dr. Jason, I would like you
to comment on two points. Am I correct first, in understanding you to say
that the major source or variant in outcome is selection? Now this has some
pretty important implications that might need to be elaborated. What kinds
of selections, especially of independent study programs, are important? My
second question that I would like to ask if you would elaborate a bit more
on the role of the teacher as consultant not only as consultant but as manager
of the set of resources, manipulator if you will, and creator of environ-
ments because this part of the teacher's function may change for inde-
pendent study programs.

DR. JASON: Thank you, Christine. Let me just thank you first for emphasizing
the importance of eliminating rank. Even ranking of the general type that
schools engage in first quartile, second quartile, even if they aren't
trying to put them in a one, two, three, four, five, six rank. The point is
that it is manifestly impossible to rank scientifically and responsibly. It
is a dishonest and unscientific thing to do and it has serious damaging
effects.

To return to your question on the importance of selection, I am per-
suaded that the major source of variance in terms of outcome is input
without question. I think some of the schools that have a reputation for
the high quality of their output have that reputation with no basis other
than the quality of the students that they tend to attract because of their
reputation. The key point here is that if you want people to be effective
in some of the areas that we are not talking about in medical education, for
example, the ability to relate to other human beings in an empathetic way,

we just aren't capable of creating people who can do this if they don't have
an aptitude for it to begin with. We simply don't know how to do it.
We don't have the talent to create such an individual. The way we can do it
is by selecting students who have an aptitude, a gift or capacity, the
potential in that direction in the first place and if we care about the
issue of empathy then we have to select empathetic students to enter our
medical school. There is one simple principle that we have learned from a
great deal of research in industry, military, and education in general, that
is, if you want to predict what someone will be in a certain way in the future,
find out if they are already that way or have been that way in the past.
If you want someone who is going to be able to pursue his own learning in a
responsible, initiative taking way, they are going to have some independence
and not just be passive and respond to what the teacher tells them what to
do and then as soon as there are no teachers around they stop learning as
most of our physicians now do as you are all well aware. If you want them
to be independent, then we have to make that a major criterion for student
selection.

Now in terms of the role of the teacher as a manager of resources as
well as consultant, I think there is a potential area of difficulty here.
Many of our independent study programs, in my observations, are at their
heart no different from conventional programs because ultimately the teacher
remains the final authority, the student is passive and compliant and acco-
modating to a set of standards he doesn't understand which are perpetrated
on him in a way that he doesn't feel he can identify with. These programs
are being evaluated in a way that makes them feel at risk and vulnerable
and in danger. In this environment students work to conceal their deficiencies
rather than expose them. Ultimately the process that goes on in the indepen-
dent study program is not meaningfully different from that which goes on in

conventional institutions and this, of course, shouldn't be surprising because the teachers who participate in one program are participating in the conventional program and there is no effort to change them in the process. One is going to be an effective manager of self-instructional programs and one has to be the kind of manager who doesn't manage, who doesn't exert final decisionmaking, who is rather a manager/consultant simultaneously, who is available for the student, who is able to say to the student and really believe it, "We are in this together. If your career and your life are at stake, nobody cares more about your ultimate destiny than you do, and if you don't care about it, and you are relinquising it to me, you are in trouble." This same holds true of the practicing physician. He must not say to his patient, "You must do this." He should say to his patient, "I recommend that you do this, but it is your body and your life and these are the options that are available to you. Which do you select?" Not every patient is ready to accept responsibility in that way. Part of our responsibility is to help them learn to take responsibility for their own lives. We have the same obligations as teachers.

Discussion Point: Individual (Private) Learning vs. Group (Social) Learning

DR. GARCIA: Dr. Jason, you talk about learning as being a private process, but at the same time give a series of examples which indicate the opposite - that learning is a collective and social process. Since the program's goals, conditions, etc. determine the knowledge that is going to be learned (the form and even the content), it seems to me that individualized instruction or private learning supposes independent study. I don't know if there is any difference in the language or even in the meaning of the words. Our experience in Latin America is that learning is done by groups. It goes beyond individual learning and is more creative, even overcomes individuals'

deficiencies. In this sense it seems to me that independent studies, if I am getting it correct, as individual studies is a contradiction in a society in which the tendency is towards social production and social knowledge. Could you clarify this inconsistency?

DR. JASON: It is a difficult question to answer briefly because it is an important and complex question. Let me say that, ultimately, each individual has to feel learning individually because their learning is a reflection of their uniqueness and particular strengths and deficiencies that they bring with them to the learning setting. The combination of past experiences is a very important concept in the level of readiness for learning. To this extent, learning is a very private matter; however, that doesn't mean it goes on in isolation from other people or from a social context. It is very much a social phenomenon. One of the things that I would offer for your consideration that was not included in my paper is that, ultimately, individualized learning, I believe, proceeds best when done in small groups, not when done privately with students alone. The way some study carrels have been designed is for them to be used by two, three, or four students who can come together to learn, the point being that in the experience of helping one learn, one can learn more one's self than one can alone. The social context in which one learns those things that are valued, those things that are emphasized, those things that one cares about has a profound influence on how I learn, but ultimately learning is a private matter because of my uniqueness and my readiness to learn, my interests, my problems, and my future plans.

DR. BRYANT: Thank you very much. I am sure that Dr. Garcia has called our attention to a fundamental issue that we will have to return to later in this conference.

Discussion Point: The Faculty and Student Acceptance of Methodological
Changes

DR.HADDAD: In Latin America there are situations that are probably not

found in this country. Specifically, resistance to methodological changes

within the faculty. My question, then, is, "Does the American experience

of introducing different methodologies have any negative effects or can this

problem be solved easily?"

DR. JASON: We have a lot of experience in the United States in trying to

make changes. However, there is not a great deal of experience with success-

ful change. The observation that you have made, I think, applies to the

United States as well. Ultimately, a great many of those things that are

called change are really just surface changes that are not true meaningful

change. Things get reorganized on paper and the sequence of events might be

altered or the things might go by different names, but the crucial deter-

miners of education, those four things that I mentioned of how students are

selected, how they are evaluated, the kinds of models that are available to

them, those things that are most potent in their influence on students

change very little from year to year. There are a few institutions that

have made some meaningful changes, but they have happened only in the context

of what might be called a revolutionary upheaval within the institution.

This involved the dominant figures in the institution (i.e., the program

administrators, department chairmen, senior professors).   It is also common

in those very few new schools that really try to do things differently.

Most new schools, however, have just become old schools very quickly, and

new buildings are problems, and your problems of change are not very different.

DR. TRZEBIATOWSKI: I think of two comments that I would like to make. One
relates to the problem of acceptance by faculty of new programs and new
methodologies. I think that independent studies are no different from
any other innovation. The faculty are going to be threatened by change and
you simply need to take a look at some of the change strategies and begin to
worry about the change process right from the beginning. When you
start a new program you know you are going to have some problems. I
contribute the loss of two of our basic science department chairmen to our
independent study program at our school. They simply put themselves in a
position at the outset where they said, "This program will fail," and went
on public record with their comments. They said such things as, "The stu-
dents cannot be made responsible for their own education." "They will not
learn properly." etc., etc. When the program, in fact, became successful,
they lost so much public face that they were forced to leave the institution,
not that we asked them to leave, but they simply could not bring themselves
back in line with the changing philosophy of the school. I think the
biggest factor in thechange process is the administration; how the adminis-
tration handles innovation and change is crucial. A good administration
recognizes that the faculty are threatened and bring about change on a slow
gradual basis over a fairly long period of time.

The other comment I would like to make is really a question which
relates to students. Can all students benefit from independent study
programs? I have struggled with this particular issue myself. We have at
Ohio State experience particularly in biochemistry where the entire bio-
chemistry program is taught by independent study. All students are doing
very well, yet there are some students who in the independent study

environment are uncomfortable. My basic belief is that all human beings

can learn in the independent study mode but that it is very important

that they have a past history of independent study. If they do not, some

of them have difficulty in moving from the traditional program into an

independent study type of program and they need some transition time as

well as transition help.

DR. JASON: I would just like to make one comment in response to emphasize

what Dr. Trzebiatowski has said. I would like to offer that the question

is not so much, "Can all students benefit from independent study programs,"

but I would like to change the question and say, "Is it safe for all of us

to graduate the kind of physician that would not and could not manage in an

independent study program?" If they cannot manage in an independent study

program, we know that they will not manage as independent learners later and

that I worry about their safety as practicing physicians.

DR. BRYANT: That was a powerful ending point. We can say how grateful we

are to Dr. Jason for this systematic and clear presentation. I am also

grateful to Dr. Yepes for calling our attention to the problem of climate of

competition; to Drs. Small and Lobo for suggesting that it is important to

convert the idea of competition, perhaps through students participating in

educating one another and even evaluating one another; to Dr. Garcia for

raising this important question of the internal contradiction between the

independent and individualized learning and group planning; and to Dr.

Haddad for the question of acceptance of change, and I must assure him that

Latin America is not unique in its having difficulties in bringing about

change within faculties; to Professor McGuire for suggesting we should try to

eliminate the ranking of students. Finally, this matter of teachers serving

as consultants and managers is an important issue, and I hope we will come

back to it in another session. It is that much of the work of physicians in

the community is not as an individual doing things to or for the community,

but rather as a leader, as a manager, and as a consultant. We have the

interesting possibility that the most appropriate approach to teaching

students is the approach in which the teacher functions as a consultant

and manager thus providing our own model for the student who will be a

physician, who should be a consultant and a manager, an interesting possibility.

INTRODUCTION TO PAPER BY DR. TRZEBIATOWSKI

In Dr. Trzebiatowski's background paper entitled "Curricular, In-
structional and Administrative Issues in Planning Independent Study Programs"
he reviews the need for physicians to act in a professional capacity with
the ability to learn on an independent basis in order to build the several
functions which a physician must carry out during his lifetime. These
are identified as position of scientist, as counselor/humanist, as teacher/
administrator, and as community health care leader. He further defines the
independent study programs as those academic programs which make it possible
for a student to self determine what he is to learn, the mode of study and
the learning resources which he is to use in mastering objectives in order
to achieve a high level of subject matter mastery and to become a self-
directed life-long learner.

The role of the creative process in curriculum organization and
development is explored. Outlined are six characteristics developed for
an educational environment which fosters creativity in students. A dis-
cussion of the definition and differences between curriculum, instruction
and evaluation constitutes the subsequent section. The following curricular
issues are discussed:

1) Who should decide curricular issues? (e.g., How much time in
   the medical curriculum should be devoted to nutrition education?
   Should a physician be "educated" or should he be "trained"?

2) Should students participate in the curriculum development?

3) What is the role of behavioral objectives?

4) What are the stated learning outcomes?

5) What are the curricular goals?

6) What is the curriculum development process?

PART II

EDITOR'S INTRODUCTION TO PART II

During the first half of the conference, background papers were presented and discussed which were designed to give the conference participants a working knowledge of independent study programs, the current state-of-the-art and critical issues relating to the development and operation of independent study programs. This was successfully accomplished in order that the conference participants might turn their attention during the second half of the conference to indepth discussions of the potential integration of independent study programs with health care delivery systems. Panels were organized which focused on 1) interrelationships, 2) resources, and 3) curriculum and program administration. Each panel had four members who gave brief presentations relating to the topic of the panel. After the presentations, an open discussion followed. These discussions provided an ample opportunity for clarification of issues, concepts and the potential for community based independent study programs so that both the medical student and the health care delivery system could maximize the benefits of their interaction. Any attempt to reduce the dichotomy between university based, physician education programs and practice oriented health care systems, was judged to be extremely beneficial.

The final session of the conference was devoted to a summary session. The remainder of this report follows the same format as the conference itself, with a brief summary of each panel member's presentation, followed by a summary of the general discussion and the rapporteur's report.

INTRODUCTION TO PART II
By Dr. Ferreira

The second half of the conference, as we indicated on the first day,
will follow the panel/group discussion format. As indicated in the agenda,
three panels have been constituted each dealing with a major topic. The
second half of the conference differs sharply from the first in that in the
first half of the meeting the presentations were dedicated primarily to
formal presentations dealing with pedagogical methodology. From the be-
ginning we planned to get the most out of these formal presentations by
following them with a more flexible method of group discussion. This dis-
cussion would be focused on how all of these ideas can be related to or
support the development of an integration of education into health services.

The conference title, "Independent Medical Studies: Their Potential
Impact on the Health Care System" which appears in the agenda of the program
should be reconsidered. Maybe it should be the opposite. Perhaps, in order
to increase the discussion it should be stated as "The Integration of Edu-
cation Within the Health Services System". What we have been discussing
to this point in the conference about independent studies may be useful and
helpful, but it does not indicate the degree of integration of the educational
process within the health services system. This has a direct relationship
to Dr. Fulop's comment which he made yesterday. He was especially interested
in the sub-title of the conference which is "Their Impact on the Health Care
System". Our concern should be for the impact of a close interrelationship
between health care and education. In other words, "What would be the
effects of a closely integrated medical education and health care system?"
In this regard, our plan is to listen to the experience of the panel members
who have had direct experience with the topic and use their comments as a

means of stimulating further discussion in which everyone would give his
own point of view.

PANEL I: THE INTERRELATIONSHIPS

Panelist I - Dr. John Bryant - World Public Health and Independent Studies

DR. BRYANT: Thank you very much Dr. Ferreira. I would like to address the
questions of "What is the importance of independent study programs for
community-based education?" and, "What is its impact on the health care system?"
In order to make my position as clear as possible on the questions suggested
by our chairman, I would like to begin by describing the particular per-
spective in which I will be addressing these questions because it is a special
and even narrow perspective. I will then proceed to identify some of the
crucial issues that I believe face the health care systems and how these re-
present a challenge to medical education. I will return to the matter of
the place of independent study programs as I see them. But, first, let me
begin by telling you briefly the answers to the questions posed to me.

1. The abbreviated answer to the question of the importance of inde-
   pendent studies for community-based education is that I think it has
   considerable potential, but in the short run will probably be unim-
   portant. In the long run its importance depends on how much impor-
   tance the faculty of medicine gives to community-based education.

2. A short answer to the second question, "What will be the impact of
   independent study programs on health care systems?" is that I
   believe its impact will be negligible; i.e., I think it will have
   virtually no impact.

Now, let me build my reasons for taking these positions and begin by

describing the perspectives that have brought me to this conclusion. Let me

try to explain why I take this extreme and even pessimistic position.

Health care systems around the world are seriously inadequate for a

very large proportion of the population since they are unreached, untouched

and unaffected by modern health care. In some countries of Asia and Africa,

no more than five percent of the population is reached by modern health care

systems. Throughout most of Africa and Asia, seventy-five to eighty percent

of the population is unreached. In Latin America, I understand that the proportion

is not that high, but it is still substantial. In the United States there

are parts of the population that essentially are deprived of health ser-

vices. Medical education is certainly not to blame for this state of

affairs, but medical education has been a participant in the arrangement.

I share in the efforts to improve the state of deprivation of these

populations. My particular interest, therefore, in medical education is in

reducing the extent of that deprivation. I have limited interest, therefore,

in those aspects of medical education that are directed towards better care

of the affluent populations. I have limited interest in internal refinements

of the educational methodology that have no impact on the well being of these

deprived populations. I do not mean that these issues are not important,

but, in my thinking, they do not have a high priority. It is this perspective,

then that shapes my thinking about the desirable outcomes of medical education.

When I think about the impact of independent study programs, I think about

it from that unique perspective.

Let me describe some of the crucial issues that face health care systems.

First is the limited and maldistributed resources that are available for

health care throughout the world. In most of the countries of Asia it is

common knowledge that the amount of money for health care is less than a

dollar per person per year. In Latin America, those numbers are somewhat more,

perhaps five, ten, twenty dollars and occasionally, forty dollars per person

per year.   The physician to population ration in Africa and Asia is

1:20,000, 1:50,000, 1:100,000 or 500,000 depending on the area.

The second crucial issue that I will describe is that of the style of

health care.   At this time, as already stated in the opening remarks, it

is oriented toward technology intensive, hospital-based care.   This orien-

tation is too narrow and does not match the needs of the population.   As I

mentioned, the health care system reaches a limited segment of the population.

Further, and very important, health care systems are oriented largely towards

those who seek health care and not towards those persons who are most in

need of health care services.   I think this is one of the most crucial issues

in health care on a world wide basis and one that is almost entirely ignored

by medical educators around the world.

Third, there is an inadequate use of auxiliary or paramedical health

personnel, and equally important there is an inadequate use of community health

care workers.   The final crucial issue that I would identify is that there

is inadequate use of community resources.   Material resources that are already

in the community such as personnel, land, buildings, crops, money and other

non-material resources such as ideas, commitments, and the ability to reach

the populous are not being utilized.   Now the challenge that this presents

to medical education has to do with the series of roles that physicians can

fill relating to these under-served populations around the world in both the

less developed and the more developed countries.   The need is to produce

graduates who are commited to and competent to function in the areas of

greatest national need.   It requires two commitments.   One that will carry

them there and the other the competence to function in the settings in which

they find themselves.

These conditions, then, describe the role that has to be filled,

with limited resources, by one physician leading a substantially larger

health care team that includes trained health care personnel and people

from the community who are involved in planning for the best use of these

scarce resources. Particularly important is the need to reach those parts

of the population which are in the most need of health care. This, of course,

means developing methods of finding them wherever they are and bringing care

to them - whatever their need, but always within the discipline of available

resources.

I wonder what the planners of the conference meant when they said

"community-based education?" It cannot be just sitting lightly on top of the

community. It must somehow be socially, economically, and instructionally

integrated within the communities. Thus, the physician that is needed is one

that will be where he is most needed. That physician can be a leader, a

planner, a manager, a consultant and a clinician as well as an educator.

Now let me go from this point to discuss the usefulness of independent

study programs in meeting this challenge. I hope I have given the impression

that I think that there are almost two different levels of discourse. One

is the philosophical discussion of a method of medical education. The other

has to do with social purposes and how policy is made in countries and in

social organizations; i.e., a health care system and the medical care system.

First, I believe independent study programs can be used in a very ex-

citing and creative way to increase the competence of physicians who will be

practicing in these settings and perhaps even influence their commitments to

community-based education, although I believe that is more questionable.

But, I think there is a more fundamental issue which is that relatively few

faculty members and relatively few students are truly interested in community-

based health care. Medical education is generally facing in a different

direction and an educational method such as independent study will not turn
medical education around. What is needed, I think, is what I call a trans-
formation of perspective for in order to have people learn or institutions
learn, they must see themselves as having different meaning within a new
perspective. If this is the case, then they are ready to learn some new ideas
and methods.

Panelist II - Dr. Mario Chaves - The Foundation as Change Agent

DR. CHAVES: I would like to briefly discuss the role and strategy that a foun-
dation can plan in bringing about changes in both the educational process and
the health care system which will result in the improvement of health
services to the population of which Dr. Bryant referred. I don't have specific
rules that state that these changes should be synchronized changes, but
the process must begin somewhere. The ideal situation, of course, would
be for the educational system and the health care system to change simul-
taneously. However, both agencies are not always ready for change. If the
university is ready, then we should start with them. If the health care
system is ready for change, then we should begin there. It was our custom
in the early stages of our program of integration of clinical teaching and
clinical care to give our foundation funds to the university because we
viewed the university as the principal agent that would influence changes
in the health care services. But, we have moved to another stage in which
the Kellogg Foundation has funded projects in the arena of synchronized
development of education and service; thereby, the focus of responsibility
for implementation of the project was changed. If the changes were in the
service portion of the health care system, then we gave the grant to the
service segment. If changes were going to be made in the university's area
of responsibility, then the grant was given directly to the university. In

this way each segment administers its own grant and carries out its own responsibilities with joint planning of the whole project by the two segments.

At the present time we have reached a point which might be characterized as a third stage. We already have under discussion projects in which the grant will be given to specific service areas with the idea that the university is not yet ready to participate because it does not have those pre-conditions that Dr. John Bryant mentioned earlier. The university is not motivated. It is not interested, but the service segments of the health care system are motivated to move ahead with changes and improvements in the services offered to the populations. We believe that once the major objective is clear, the more the process of change can be accelerated either by simultaneous projects between the service segment and the university or by intiative of one or the other since our final objective is better health and better services. Basically, then in this present stage we are ready for projects for the development of health services in which the university is not the primary participant. Even within the health services sector we find that we are working more with personnel at the intermediate level or auxiliary level.

I believe, then, that the role of independent studies will become more important as long as the need for change in educational philosophy and changes in the health care delivery system exist. However, I think we are leaving the phase in which we expected too much of and exaggerated the whole movement of self-instructional materials. We are going back to recognize the importance of human interaction in learning. We are beginning to realize that there are only a certain number of hours in a day and that if all of this time is consumed interacting with audiotutorial materials, then that time is not used in interacting with the realities of the health care system. I

think there is a place for both. I think that we are entering a time when we give a reasonable proportion (i.e., a fair emphasis) to teaching materials and the actual work in health care services. I want to point out the importance of working within the health care system and returning to the idea that the system is integral in terms of primary, secondary, and tertiary care. The passing of students through the several levels of systems has important consequences for the role for which they are being prepared to serve. Thank you very much.

Panelist III - Dr. Rodrigo Gutierrez Saenz - The Costa Rican Curriculum: An Integrated Health Care and Education System

DR. SAENZ: In Costa Rica the problem of self-learning or self-teaching was widely discussed in the years 1970 through 1974. Since then we have designed the present curriculum of the faculty of medicine. We concluded that self-learning is more than a methodology. Self-learning ought to be an attitude completely incorporated into the student's behavior. We are all aware that medical knowledge is constantly changing and we also know that medicine, at least in Cost Rica and some other countries, is trying to adjust to the health care needs of the population. The whole health care system is obligated to change to a new concept which has been determined by our society. This obligates the medical doctor to have a necessarily large capacity to be adaptive to the changes that are taking place within our society including a new type of health care delivery system - a system which is much more responsive to the health care needs of the people. Since we don't have university hospitals in Costa Rica and by law have access to all health institutions, these institutions need the resources of the faculty of medicine; i.e., the human resources that we have available. This point is

very important because a political decision was made eight years ago that
health care should be available to everyone through the Scoial Security
System. Naturally, this has completely changed health care, and, most of
all, has influenced the way the actual practice of medicine is carried out.
We quickly realized at the School of Medicine that we could not continue to
prepare physicians to deliver private care.

We also took into consideration that in a society such as ours, to
study medicine is simply an opportunity to rise to a higher social status.
We found that many of the students entering the university and the faculty
of medicine were from the city and were not really interested in dealing
with the real problems of health. With these factors in mind we recognized
the need to consolidate our health care system. We also were obligated to
recognize the importance of self-learning and the need to incorporate in
the medical student's behavior the necessity of being in permanent contact
with his needs; i.e., to improve his knowledge base and other aspects of
his profession. In the first year of his training, we began training the
student as a critic by giving him a set of tools for intellectual work.
We eliminated pre-medicine with the assumption that it was too scientifically
oriented and not sufficiently based in reality. We admitted 180 students,
then divided them into groups of 14 making each group responsible for its
own organization. We forced them to choose a leader and to create whatever
rules would be necessary for their efficient operation. We began their
training by forcing them to face a series of practical problems and we gave
them a series of instruments with which they could deal with these problems.
The tools might be characterized as the technology of intellectual work; e.g.,
how to use the library, how to write a report, etc., including how to read
a book from the scientific point of view. During the first year we placed heavy

emphasis on epidemiology, general biology, terminology, and the applying of

the epidemiological method. Combined with the epidemiological method there

is a concentration of knowledge related to the social aspects of health.

They quickly learn that the problem of health and sickness is deeply related

to social class. With these tools, after nine weeks of study, the students

go into the countryside to gather information and to study the real situation.

By the end of the year reports are made which become the basis for the

evaluation of students' progress.

Our students never work individually because that is not the type of

education we want to give them. Each will work throughout his career in

groups and although we divide the groups of fifteen into smaller groups,

it is necessary that students face the problems they find in the community

as a group and that their product is the result of their observations and

discussions, etc. as a group effort. Involvement in the study of actual health

problems, such as those found in airports, helps the students identify a

series of facts that they can accumulate and face directly by using their

epidemiological and sociological tools. Students may be assigned to a

sanitary unit outside the city and away from the hospital. Under the super-

vision of instructors they work in this setting as nurse's aides, dental

assistants, or sanitary inspection aides. By doing assistance work,

students acquire important health care skills. It is in these settings

that we have utilized some of the packages called self-learning. We have

found that they can generally be used in the biological part and in some of

the social aspects of the problems facing the students. The students are not

always happy working as an auxiliary in these settings, but we think that

it is a normal response and the experience is an important part of their

education. It is important that the student learns to work independently

since the student has always been guided from the time he was born. First

he was guided by his mother, then by his teachers.

In the second and third years students are given still more tools particularly in the administration and planning of health care. The student continues to work in the sanitary units in some hospitals and in various ministries in order to acquire experience utilizing the important concepts of administration and planning. He gains additional knowledge, for instance, in a birth unit by developing skills in the delivery of newborns and taking care of healthy newborn babies. In this way the student is moving in and out of a variety of health institutions. At this level I don't really see a very important use of self-instructional materials as they have been defined. A student always works at a level in accordance with his know-ledge. As he advances or improves in his knowledge he is given more respon-sibility. The student quickly learns that when faced with a concrete pro-blem he really can learn through self-instruction. He also has considerable social pressure which is developed as a result of being a member of a group. Since the individuals in the group are evaluated on the group's performance, individual student efficiency in learning and problem solving is often the result of group pressure. If we consider self-learning as an important part of the teaching/learning process in a wider context, then I think we can go beyond the old narrow interpretation of self-learning.

Panelist IV - Dr. Paul Werner - The Upper Peninsula Project: An Experiment in Integrated Education and Health Care

DR. WERNER: I would like to share with you an experience that has taken place at the Upper Peninsula of the State of Michigan in the United States which I think, to one extent or the other, expresses most of the concerns mentioned in the last day-and-a-half. I don't have a particular theory

but I hope that showing you the practical side of things that we are doing will give you the feeling of how some of the precepts taught us thus far in the conference can be implemented in a real world community center.

The Upper Peninsula of the State of Michigan is a relatively economically poor area compared to other areas in the United States. It certainly does not match the level of poverty described by Dr. Bryant, but relative to other areas in the United States, it is a poor area. For instance, in the United States the average physician/patient ratio is 1:750. In the Upper Peninsula it is 1:2700. If you remove the physicians who are near retirement or who have already retired, the average goes even higher. My institution, Michigan State University College of Human Medicine, is located in the lower part of the State of Michigan in the city of East Lansing. Thus, the Upper Peninsula medical education project is geographically separated by a considerable distance from the parent institution.

This project started in 1972 with feasibility studies with the actual medical students being enrolled in 1975 so we have, at the present time, approximately a year-and-a-half of experience. The goal of the project is to improve patient care in the Upper Peninsula by providing more primary care phsyicians; i.e., family physicians, general internists, and general pediatricians. In other words, we hope to train a specific type of physician. We want to keep him in the Upper Peninsula in order to practice.

Some other goals that are equally important have to do with education. We would like to produce a physician who has the capability to continually evaluate himself and motivate himself towards educating himself in areas that he finds himself to be deficient. In order to do this we establish from the outset a collegial relationship. I tell them that, as far as I am concerned, as soon as they enter the program they are physicians. What separates them

from myself is that I know a few more things then they do. If they are willing to work with me and use the facilities that we have, I will try to shorten and narrow the discrepancy between where I am and where they are. We are actively involved in the community in which we are located. This occurs at all levels. In fact, we have a complete partnership between the university and the community in the operation, the administration, the finances, the admissions, the faculty and the staffing of our program.

From the very beginning, the Upper Peninsula project was organized as a non-profit corporation called the Upper Peninsula Health Education Corporation which has representatives from across the entire Upper Peninsula area. The corporation has a wide representation of individuals including physicians, lawyers, patients and educational leaders who, together, operate the administrative unit. They have hired a hospital administrator who serves as executive secretary for the corporation. On the other side of the ledger, the university has an acting director, my immediate supervisor, who is responsible for the educational input. The funds which the State of Michigan has designated to run our program are given to both of these institutions. Approximately 60% goes to the university and 40% goes to the community through their non-profit corporation. Programs cannot run without 100% agreement of how our funds will be spent. So, individuals of the community have a direct voice on how the program will operate.

The Admissions Committee is made up of 13 members. Twelve members are Upper Peninsula natives who live and work in the Upper Peninsula. There is only one representative from the university so that the admission of students to our program is done entirely by members of the community in which it operates. The basic minimum standard which the university has for medical education must be met by the student. These are, in terms of pre-requisites,

a certain grade point minimum average on pre-test scores. In addition to
these minimum requirements, the community has adopted an additional set of
standards. The student must be highly people oriented and he must be
willing to work in a rural area. The applicant should also be from the Upper
Peninsula or have strong ties to the area.

We incorporate early professional experiences in our program. The stu-
dent starts seeing patients in a family health center starting in his
eleventh week of medical school and continues to see patients throughout the
three-and-a-half years of medical school. The patients are assigned to
him in family units. By the time he becomes a second year student he has 15
families assigned to him. By the third year he has 50 families assigned to
him for whom he is directly responsible for their health care with the pro-
vision that I am available to supervise them.

There is an integration of basic biological and behavioral sciences
in the curriculum through the use of focal problem instruction which Dr.
Trzebiatowski eluded to this morning. We have divided the basic core
curriculum of the first two years of medical school into 13 focal problems
with titles such as "acute abdomen," "failure to thrive", and "elevated
BUN" so that within these focal problems which last from 3 to 5 weeks the
student not only learns problem-solving skills and the clinical sicences rela-
tive to that particular problem, but he also learns behavioral issues in dealing
with patients that have this particular problem as well as the social issues
and the community resources that are available to manage a chronically ill
patient. The students tend to operate in groups and solve the problem
together using their combined knowledge in addition to the use of self-
instruction materials which are available to each student to use independently.

The program is highly people oriented. By that we mean that throughout

Committee. There are students on the Curriculum Committees and they have a
vote equal to the faculty and community members. Students also participate
in budget and fiscal allocations, in the setting of objectives for gradu-
ation and are involved in the evaluation process. Each student is asked to
evaluate himself against the criteria that has been established. This is
even more important then the evaluation done by the instructors.

One of the our long-term goals is to establish a health care team
approach. This is currently in the process of being negotiated with the
Kellogg Foundation for financial support. At the present time the health
team approach is not being carried out to our satisfaction. We are, however,
trying to establish some primary care centers in extremely underserved areas
in the Upper Peninsula where our students will be able to go and work with
a health care team which will involve nurses, physicians, public health
people, sociologists, social workers or whatever it takes to provide the
care that the particular community needs. It is our plan that the community
will have as much input into the planning of the health care center as the
community had in organizing the overall program.

The curriculum is divided into three phases. The first phase is the 10-
week introduction to medicine in which there are no formal courses.
Problem-solving techniques, interviewing skills, self-diagnosis of patients
that the students will be dealing with are all designed to prepare the stu-
dent to become part of the health care setting which begins during week eleven.
This starts off Phase II which is the focal problem sequence lasting 50 weeks.
Those 50 weeks are combined patient care and focal problem instruction in
order to acquire basic science skills. Finally, Phase III is 70 weeks in
length with an optional 20 weeks if the student wishes to stay longer.
Phase III is an integrated clinical science sequence using our outpatient

the entire curriculum the impact of the disease on the person is where our interests lie rather than in the disease itself. To a great extent we are teaching our students how to manage patients who happen to be ill rather than the illness that happens to come in via a particular patient. The program is flexible allowing graduation as early as 33 months and as long as 72 months. We go to a great deal of effort to allow students to progress at their own rate in order to do this. Each student has in his possession what we refer to as a student learning record. In the student learning record we are placed statements of behavior to be accomplished before the student has completed his training. The student then sits down with the appropriate coordinator. There is a coordinator for internal medicine, obstetrics/ gynecology, pediatrics, surgery and the behavioral sciences, as well as myself, for primary care experiences. The student and the coordinator write a written formal contract agreeing to accomplish a certain number of these items within a specified period of time. These items can then be evaluated by specified evaluation mechanisms that both the coordinator and the student have agreed upon ahead of time. Finally, at the bottom of the record there is a place for the student and evaluator to sign that, in fact, the contract has been satisfactorily fulfilled. Any product available that will prove that the contract has been fulfilled is on file in the student's learning records. For instance, he can write into the contract that it is going to take him six weeks to accomplish a certain piece of work that his colleagues may have taken only two weeks to accomplish. What is important is that it is completely acceptable to do this. If he discovers that he has misjudged and it will take him 12 weeks to accomplish what he thought he could do in 6 weeks, the contract can be renegotiated on a monthly basis.

Students are heavily involved throughout all apsects of program planning. Two student sit on the Admissions Committee. There are students on the Progress

facility and a family medicine model to teach all of the clinical disciplines simultaneously. We do not have a designated time set aside (for example, 12 weeks of pediatrics or 12 weeks of internal medicine), but rather everything is taught in a coordinated fashion. The student has 45 weeks of electives in addition to the 70 weeks. The evaluation of our program involves testing the student to see if he has acquired the content which he hopes to learn. In other words, they do know that normal blood sugar is 92 to 110. We also test them in the problem-solving areas so that they can diagnose if they are given pertinent data. The students do a great deal of self-evaluation on the personal level in terms of their relationship with patients. We are currently in the process of organizing the family practice residency at the primary care centers outside of program headquarters. We have just become actively involved with community hospitals in the area of continuing medical education for the practicing physician.

In summary, I would like to say that I think that it is possible to put independent studies to work in the community to meet community needs as designated by the community itself. and I believe that is exactly what we are doing. Thank you.

PART II - SESSION I

Dr. Ferreira - Introduction to the Discussion Session on Interrelationship of Medical Education and the Health Care System

As I am sure you noted from the informal and candid comments made by the members of our panel, there are very clear but opposite positions concerning the value of independent studies. In one case, it was given low priority and in the last presentation it was clearly stated that independent studies could be applied in a field situation. I am of the impression that we could

clarify the situation if we would come to agreement on our definition of

independent study. It is my impression when we are speaking about independent

study, we are referring to a specific technique and not to a general process.

I believe that at this stage of our discussion we are talking about the sub-

ject of clinical teaching - specifically the integration of clinical teaching

and health care. This is a very wide subject and we are searching for

processes or mechanisms that can facilitate the further integration of medical

education in the health care system. I believe this was the purpose of this

meeting from the very beginning to present some practical experiences in using

different techniques of independent study in the medical education process.

You must recognize that independent studies can be applied to a variety of

levels ranging from abstract learning to learning at the service level. As

we carry on our discussion we must remind ourselves that we are looking at

the whole process of individualizing the teaching that is done at the level

of health care services for patient care - if possible, within the context

of clinical instruction. With this thought I open the debate.

DR. MANILLA: I do believe that it is important to make this differen-

itation because we are referring to the competencies, not only that a physician

must develop but also those of any other professional which are useful for

his future professional life. We will continue seeing a common phenomena in

Latin America which is that once the professional, in particular the physician,

graduates from school, he supposes that he has acquired all that he is going

to need for his future professional life. Frequently he becomes dependent

on "other authority figures" such as laboratory technicians for his new infor-

mation. To admit to this is indeed painful, but it happens in a great many

cases. In effect, a professional is acquiring information from paraprofessional

sources which he uses in his professional practice. This information, of

course, is used with the associated risks and all that it implies.

I believe that every professional should have the capacity to continue studying and learning in an independent manner with the goal of keeping up to at least the minimum standards of information and competence in his profession. This professional capacity consists basically of being able to define problems and search in a direct and efficient way for needed information. This capacity has to be developed within the curricular processes and I believe that it can be an indepensible quality for any professional person. It is not safe to assume that if a person has acquired the qualifications of a professional, he would necessarily have developed this competence.

I believe that another way of characterizing independent study is through specific learning techniques which are sometimes referred to as auto-learning or self-instructional materials and also sometimes referred to as modules or learning packages of the kind used by the open university. I don't believe that the use of this type of teaching material necessarily confers the capacity for independent learning. I believe that the best resources, as I mentioned in my paper, are original documents of the type found in a good medical library. The use of library services is an essential part of the development of an independent learning capacity which I referred to earlier.

It is a notable fact in Mexico, and as a result of my conversations with individuals from other countries, as well, that the general reading ability among college students is diminishing. There seems to be an increasing inability of students to get information from sources that are listed in the bibliographies. I believe that it is important to come to a basic conceptualization of what independent study is. We must avoid mixing it with a specific

technique or way of teaching.

DR. WERNER: Even more important than the ability to study on one's own is
the need for the student to develop the ability to recognize personal
deficiencies. It does not pay to know how to study if one does not recognize
what he must study. How can this ability be developed? I am not certain.
At Michigan State we have some techniques that we are using. For example,
1) having the student keep careful records of his professional activities,
2) having the student keep a set of behavioral statements that he must
master, and 3) requiring a written contract between the student and faculty
member concerning required learning outcomes. Activities of this type may
or may not work. It will be years before we know whether they do, but it
seems to me that if we teach self-evaluation, the self-learning will come.
The opportunity to practice self-learning is inherent in independent study
programs. Self-teaching units or a videotape can be readily used once the
need is identified.

DR. FULOP: We are often asked in Geneva by institutions in member states to
comment and collaborate with them in updating their content and method of
teaching health personnel. Therefore, it is quite natural for me, when I
hear of some innovation, to want to learn as much as possible about it. I
always try to get a reply to the question, "What purposes could be served
in our practice of collaboration with countries and with institutions when
we suggest the introduction of this or any other method or innovation?" I
would like to offer my understanding on the basis of almost 2 days of dis-
cussions which I think were very well planned because there were generalizations
and conceptualizations first.

Now this afternoon, we have heard about a very concrete experience from

Dr. Werner which I enjoyed very much. At the present moment, my understanding

of independent studies is that we can recommend this method. Its virtues

are that it can help many people to: (1) maintain their learning when they

finish their studies, (2) develop independent learning, and (3) maintain

creative thinking in those people who already have this capacity of creative

thinking before they enter medical school. It certainly can help in

orienting toward problem solving. But, I cannot deny that I am frustrated

by the capacities of this system as far as the great student number problem

is concerned which we have attending medical schools in many developing

countries. I fully agree with Dr. Bryant, that penicillin is a very good

drug for many things and we should not blame it when it does not cure cancer

or myocardial infractions. Still, it is a very good drug for many other

things so I will try to list the problems that could be solved by this method.

But first, I really don't think that either the problem of influencing

health services or health care systems or orienting the school toward a

community-based education could be served by this new approach. However, if

a school accepts the problem-based and community-based educational approach,

then independent studies could be a very good one to couple with these

approaches. That is to say, I do not think that simply adopting an independent

study program would make a school problem-oriented or community-based. If it

were decided independently that the school should go to a community- and

problem-based education, then it would be very nice if they would also use

an independent study approach which would enhance the impact of the two

previous decisions.

DR. TEJADA: During these two days, it has been really interesting and exciting

to learn of the experiences of our American colleagues. Your reality and our

own experience in many Latin American countries leads us to some contradictions

at a more sociological level than a proper medical level. When we analyzed

the situation in our Latin American countries, we found the traditional

method of learning has not been an adequate answer. It is a method that must

be changed because this method was transplanted into our environment and is

not a method unique to our situation. We must produce our own unique

method. We must search for causes of the failure of the traditional method

and find solutions to our problems which go beyond the educational field and

the medical field. When we examined the failure of the traditional method

of instruction we found that it had become a method of conditioning because

it is not our method. It is not a failure of the professor or of the

university but a means by which our societies can shape and control the

health care resources in our countries. We must look carefully at the product

that we wish to produce when developing new methods of instruction. At this

point in our discussions, we have not defined the product. We must ask the

question, "A physician and health resources, what for?" The problem has not

been defined by the university or by the traditional educational systems.

Those that have defined it are the ones that have defined the product. In

our society medicine has become merchandise, social class medicine, and the

product is made for a professional practice which is used to produce money.

Now, if this is true and you wish to produce a new product, then we must do

more then train another type of physician or change the university and the

health care system in which he is trained. We must make some fundamental

changes in our society. For our American friends, the problem is completely

different from our's in Latin America, and maybe that is why we don't agree

on many things. For the Americans, the change in society is not a vital

element. For us, we have to make some changes in our society. We have to

start with the basic ideas of where we are and where we are going. We must

be very careful in adopting new technologies which may make us a prisoner in the same sense that our present society does. We must look for new answers - real answers to the problems that we have. When we talk about independent studies, does this actually mean the following? Are we going to change the university? Will we change the professors and then become dependent in another way? For our countries it is a bigger problem and even more dangerous because we become prisoners of a technology that is not ours and that we do not dominate. This is not to say "no" to this technology, but we have to discover and adapt our technology. I am concerned that independent studies may be an efficient method of carrying on the traditions of the past without training the students to see the contradictions in our society. Searching for methods that can be an answer is a formative process. We must train a physician or any human resource that exists not to contemplate the world, but to transform our society. If this is possible, then I think our concerns about Latin American countries' independent studies is worthwhile. But, when independent study means a method of individual process and the failure to face reality, and not to face the contradictions and not to look for the problems in terms of their roots, then this implies an answer which misses the problem completely. This is why we enjoyed the interchange here today because we know our problems and our challenges. The interchange can be very valuable if it allows us to share some of your experiences that may be useful in our context.

DR. AGUILLAUME: One basic subject that we have been aware of is the cost of health. In referring to our own experience when we were students, we did not really care how costly health was and I do not know if the students now are aware of this problem. I will have to ask Dr. Werner and perhaps Dr. Bryant the question, "Should a student know about the economics of health?"

DR. BRYANT: I am not an expert on when and how to teach economics, but I will give you the experience we had at Columbia University where a group of us had been trying to encourage a very conservative medical faculty to include issues having to do with health care in a very traditional curriculum. The faculty gave this group time in all four years of the medical curriculum. We began with some seminars in the first year and found the students generally were not interested. So, we revised the teaching method to make it more interesting and more exciting. They still were not interested. We asked our clinical colleagues to join us and we developed a program that we felt would begin where the students were. And where were the student? They were interested in themselves as physicians and in their relationship to patients. The courses we developed gradually evolved to the point where the key teacher was a clinician who involved the students in the discussions of patient care from the first week. But, by design these discussions were carried on in a wide variety of health care settings. Working in these settings, the clinicians and students discovered that there were economic problems in health care and that these had an extraordinary impact on the quality and nature of health care. When the student began to ask questions of an economic nature, a health economist was brought in. Perhaps we should not have been surprised when at that time, the students were intensely interested in the economic questions which had a direct impact on the patients for which they were responsible. But, when we tried to go beyond that to give them a course in health economics, the shade came down again. I think this is one of the realities of the situation in which we find ourselves. I don't know if others want to generalize from this.

Finally, I would like to say that our educational objective was to increase the student awareness and to acknowledge the importance of health economics

and not to acquire a mastery of specific content.

DR. GUTIERREZ: The faculty of medicine should expose the student to the

health care costs from a variety of different angles.   The student's training

should include, minimally, that which is expected of a physician when he is

in practice.   For example, if a physician could be expected to serve as the

administrator of a small maternal and child health unit, training would be

provided when he is a student on a maternal and child health service unit.

He should be exposed to the costs involved in administrating such a unit -

such costs as personnel, materials, supplies, etc.

Another aspect of health care costs would be from a complimentary angle

which would be to look at the relationship of health to society.   This study

unit includes such topics as impact of the production of drugs, effects of

the monopoly of international drug producing cartels, and costs of administration

of these medicine.   The unit also looks at the pressure to produce and to

purchase high technology units and equipment such as intensive care rooms,

which are really prestige schemes rather then meeting the direct needs of the

population.   Broader issues are also included such as the percentage of the

national product which goes into the health sector.   Thus, during the period

of seven weeks our students are given the theoretical and practical components

of health administration and planning utilizing the practices of an external

consultant to get a first hand look at the quality of service provided and

the supply of special services, etc.   Then, when the student is in practice,

he is required to turn in periodic reports telling what the conditions of

practice are, his observations about the administrative procedures used in

the unit in which he is working, and, finally, how costs could be lowered through

improved efficiency.

DR. WERNER: Independent studies mean to me that the student is in the driver's

seat. The student is in control in his own education. Our role as teachers

is to create the situations where the student's anxiety about not knowing

reaches the point where he identifies what he has to study and seeks

information in some book or in some other source. In that sense he is

independent. It represents an opportunity and a learning behavior that will

last a lifetime. It does not depend upon the university and it does not de-

pend upon a particular type of electronic gadget, but it depends on the stu-

dent's ability to sense that degree of discomfort that forces him to start

seeking information needed to solve the problems that are in front of him.

The situation that generates that degree of discomfort most frequently is

intensive involvement with patient care. This is why students come to

medical school. They fully expect to get involved and if the situation is

manipulated by a wise physician/instructor, varying degrees of anxiety can be

generated through the patient encounter. If he wants this information to be

on a high socio-economic level, it will come out of patient encounters.

If he wants it to be biological sciences, that will come out of patient

encounters. If it is clinical science or psychiatric manipulations, it will

come out of patient encounters. To that extent this is the reason why I

believe that community-based education is so important in generating an

independent study attitude in the future physician.

Discussion Point: Student's Role in Changing Practitioner Behavior

DR. LOBO: Dr. Bryant made the point that he believed that independent study

would not have any impact on health care. I believe, however, that if inde-

pendent study programs create in a student a habit of independent study

through self-learning and self-instruction as Dr. Manilla mentioned, it

would eventually produce some kind of impact in maintaining medical knowledge

of the people in practice. I believe that if we put together the two emerging

systems of education (the educational technology of independent study and

community-based programs), the effect will be obtained in the quality of

services provided and the change in the way that doctors practice in these

communities and deliver their care.

I also believe that technology in education has a danger. These modern

technologies may reinforce the status quo. Everyone should be keenly aware

of this. If we just increased the efficiency and effectiveness of the old

system without changing the internal functions, this simply means reinforcing

what is already there. I also really believe that this new technology may

be used as a tool to bring innovations into the sytsem, (i.e., to change the

system itself). Even if these are only small changes we must start some-

where in the process of change. Whenever we introduce simulations of clinical

problems to train students in clinical reasoning and clinical problem solving,

you may add the cost of any clinical test that will be required without in-

cluding a complete course in medical economics. We can make the student aware

that any tests that he orders will cost money and may even require hospitali-

zation. You can also add information about epidemiology which in my opinion

is best taught through the internist. If you add these new points of view

into our materials we will gradually change the thinking of the people using

them. You may also use these technologies in independent study for continuing

education. For example, we now have 600 doctors who are in charge of health

centers taking a course in health center administration. They are learning

a complete course through a kind of independent training program of self-

learning.

Dr. Bryant also made the point that generally medical education is

oriented towards treatment of people who seek health care. I believe this

is a critical issue and is important in our definition of community-based

programs. We should define the community hospital, not just as a hospital

in a community, but in my concept, as a hospital with a definite responsibility

toward the people living in the immediate area. It should not be limited to

the people entering and seeking health care, but include all the people

needing health care. It should be an active organization seeking out those

who need health care and providing a wide variety of services including pre-

vention. You must put medical education or the education of professionals

in a community committed hospital - as we are not trying to do. I agree that

it is not medical education itself that is producing the change, but we are

certainly facilitating this change if we are bringing in new kinds of

instructional materials and discussing health problems with the people there.

DR. BRYANT: Thank you for your comments, Dr. Lobo. In my remarks I did

not want to seem to be a Nielist about the value of medical education in its

relationship to health care systems. I just wanted us to be realistic about

the effectiveness of changing methods and philosophy. I think we must be

as innovative as we can in our efforts both to improve medical education and

the health care system delivery. These two are interlinked in a very

definite way. We must not loose sight, however, of the fact that they are

very complex forces that are at work on both sectors. Some of the societal

factors limit what we can do in medical education, but at the very least we

can try.

Discussion Point: Effectiveness of Community-Based Students on Continuing

Education of Their Preceptors

DR. MEYERS: As a continuing educator I would like to remind you that having

students in the community working with physicians is probably the most effective

continuing education for them as preceptors that there is. We can document change in the behavior of the preceptors in our preceptorship program. There are very few other continuing education programs in which we can directly document change. Students in the community have an affect on health care. They change the behavior of the practicing physicians in the community. I would like to take a moment and tell you of an experience of one of our independent study students who went to a community of 450 people for an extended period. For reasons we need not go into, he was required to complete his pharmacology examination at the end of the period. He had been away for three weeks when I received a telephone call from his preceptor saying, "Hey, can I have one of those independent study books? The student won't give it to me because he is studying it and I want it and I need it." After seeing the independent study module which was designed for use by medical students, the physician felt a great need to study the module.

This brings me to the second point that Dr. Werner brought up concerning the need to train students to identify their needs. It is all very well to train students to study independently, but it is very difficult. To find out how or where, we have taught students to identify professional deficiencies by looking through medical school curricula, resident training program, and continuing education program curricula. If they can't identify these needs, how can they be expected to attend appropriate continuing education programs? At the University of Wisconsin we have made one attempt to solve this problem by providing physicians (at the cost of $80) a profile of their clinical practice. We then tailor make an examination for them and based on these results, provide them with a continuing education study prescription. It might be interesting to see what sort of an attempt has been made to inter-relate continuing education and independent study. As you can see we are

in the early stages of trying to blend together two technologies to allow people to see continuing education as a viable entity.

RAPPORTEUR'S REPORT
By Dr. Meyers

I think we need to summarize very briefly the key points made by each member of the panel.

One of Dr. Bryant's main points was that although independent study had great potential for community-based medical education, its impact on the health care delivery system would be negligible. He was also concerned that health care systems are hospital based, that they are oriented towards those who seek rather than those who need medical care. Finally, although he thought that there were some uses for independent study in educating physicians, this method would have negligible effects on the health care system because he doesn't see that education of any source will have any effect on the health care system.

Dr. Chaves talked about the integration of independent study and health care and then he talked about Kellogg's approach to this integrated process.

Dr. Gueterriz introduced a most exciting curriculum. I did not get the details of it but the curriculum described was dealing with many of the problems that we have talked about in this conference. I think he is developing something which is dealing with very important issues that we are ignoring, that students are ignoring and will go on ignoring until we can change our educational system.

Dr. Werner then told how you could get community commitment to an educational system in which the community had such an investment that they would be very reluctant to see it fail. I think the medical education

establishment will find Michigan State's program a most uncomfortable experience when they critique what he is doing because what he is doing is so far beyond what we are doing that we are really not able to deal with this in an evaluative way.

PANEL II: THE RESOURCES

Introduction to Session by the Chairperson, Professor McGuire

Good morning on this last day of the conference. What we propose to do this morning in discussing the matter of resources is to work in a slightly different way from the way in which we have been working over the past two days. What we propose to do is to identify some specific issues and questions at the outset and to ask each member of the panel to speak very, very briefly and to indicate his position with respect to each issue. We invite all of you to join us in being a panel member, but with our invitation we also add a caveat. We ask you to exercise the same discipline of brevity that we are trying to impose on ourselves when making your comments and asking your questions.

A Working Definition of Independent Study.
Let's begin first with the definition. We have decided that we will not debate the issue of what is independent studies, but what we will do is give you a definition which we proposed to use for the purposes of this discussion only. We are using Dr. Werner's phrase of yesterday which is that: "An independent study program is one in which the student is in the driver's seat". By being in the driver's seat, we mean the following things:

- That the student participates in setting the goals and objectives
- That the student is free to progress at his or her own rate

- That the student assumes the responsibility for selecting and
  combining resources from available learning opportunities
- That the student assumes responsibility for formative evaluation
- That the student may be working alone with self-instructional
  materials or with others

The Teacher's Responsibility in Independent Study. If those are the
students' responsibilities in an independent study program, what are we
assuming about the teachers' responsibilities? We are making the following
assumptions:

- A teacher is responsible for creating the climate so that the
  students behave in the way that we have indicated above.
- The teacher takes the responsibility for assuring the availability
  of the resources, and
- The teacher serves as a consultant. This is the definition that will
  underline the remarks of the panelists in this discussion.

The Goals of Independent Study Programs. Now, we have futher reminded our-
selves that the resources that will be needed for any program depend on the
goals of the program. As an introduction to the panel and in order for you
to know exactly where each person stands as the discussion proceeds through
the morning, I am going to ask each member of the panel to give us the
benefit of a one or two sentence summary of the goals of the independent
study program which he is presently proposing when he discusses the needed
resources. Let's start with Dr. Trzebiatowski.

DR. TRZEBIATOWSKI: The goal of our Family Oriented Primary Care Program, which
is a 3-5 month community-based patient care experience for our senior stu-
dents, is to provide them with exposure to a wider range of patient care

experiences than they would get if they stayed in the University Hospital
and to gain exposure to segments of the health care delivery system which they
would not otherwise be exposed. Thus, this helps them make better career
choices. We are supporting them while in the communities with a footlocker
full of reference books to encourage the kind of independent scholarship
Dr. Alverez Manilla talked about yesterday.

DR. STRITTER: I would like to complement Dr. Trzebiatowski's comments by
briefly discussing a clinical independent study program that we have at Chapel
Hill which takes into consideration many of the learning principles and
characteristics which have already been discussed. First, you must decide
why it is that you want clinical education in the communities for your stu-
dents. There are at least two sides to this discussion. The strong supporters
of clinical education in the communities say that there are a lot of very good
physicians in the community who have a great deal to contribute to student
learning and, therefore, if students are sent out there something good will
happen. The academicians in the faculty argue that any education taking place
outside the walls of the University can't possibly be worthwhile. What we're
trying to do at North Carolina is a combination of these two positions. We
have six hospitals scattered around the state in which we give students clinical
experiences. Students in three of our clinical departments can take either
their entire or parts of their entire clinical experiences away from the uni-
versity if they so choose. One department in particular, the department of
obstetrics and gynecology, has made a sincere effort to individualize their
curriculum. They have decided that the community hospitals can make a
significant contribution to clinical education because university hospitals
no longer have adequate patient loads to provide for students on that service,

so, they are going to individualize the curriculum by defining some general
and some specific learning outcomes for beginning clinical students. For
each objective and learning outcome, they have also specified a series of
instructional approaches such as textbooks, self-instructional materials, and
a variety of other kinds of approaches. A student is given a manual and told
to satisfy the instructional objective any way that he feels appropriate.
When he's finished that objective, he takes a short examination whenever he
wants, or whatever time of day or night he wants, and in whatever sequence
he wishes. The student is told that he must pass each of five tests by the
time he reaches the conclusion of his experience in that department which is
a six week experience. If he doesn't pass a given test he is given remediation
and he takes it again at some point - maybe not the same day, maybe two days
later, maybe a week later.

We put a fulltime faculty member in the various community hospitals and
have them become totally involved in the establishment of the curriculum.
In order to be totally involved in the establishment of the implementation
of the instructional program there is a lot of coming and going between the
universities and the community hospitals, both by the community faculty and
by the fulltime university faculty. When there is a lot of communication
between everybody who's involved in the curriculum, the result is excellence.

Hospitals must also be involved in a faculty development type program.
They have to know what the goals are, what kind of experiences to provide
students, how to evaluate students, and how to best demonstrate the role model
which Dr. Jason talked about. We analyzed the experiences in our community
hospitals and we've discovered that there really isn't that much difference
in what goes on in the community hospitals and what goes on at the university
hospitals. As a matter of fact, one of our community hospitals looks more

like a teaching hospital than a teaching hospital does itself, and I think this is an effort on our part to make the instructional experience look as similar to what was going on in universities as they could.

We also have an instructional coordinator at the university whose responsibility it is to communicate to the community faculties exactly when students are coming, what their characteristics are, and what they are trying to become. Without this instructional coordinator the program would have some difficulties too. She is responsible for a lot of the communication that I pointed out earlier was so necessary in order for everybody to agree on the learning outcomes and how they are to be implemented.

We've found that there isn't too much difference in the outcomes the students in those off-campus centers demonstrate in comparison with the ones that the students in the on-campus programs exhibit at the end of the instructional experience, plus they do have some added characteristics as a result of being able to implement procedures which the university hospitals cannot provide, particularly in obstetrics and gynecology. Basically, that is how we try to implement and deliver our curriculum in independent study in the clinical area. Thank you.

DR. LOBO: The reason I talked yesterday about our self-instructional program as needing to be more self-instructional is very simple. In a very short time Brazil went from 40 medical schools to 73 medical schools. The total number of dollars spent in higher education increased twelve times from $90,000 to more than $1,000,000. This happened in less than ten years. The number of students increased by a factor of twelve and the number of teachers by only two. There is currently a substantial effort to increase the number of teachers throughout the country, but this takes time, so we decided that we should do something to increase the teaching efficiency and we thought that

independent study would do this. We started with the basic sciences because this area has the greatest deficiency in the number of teachers.

DR. SMALL: We don't have an independent study program as such so I will discuss this question in general. First is the idea that the independent study program goals are process goals not content goals. I think as Dr. Lobo has already stated, part of our problem in reaching a definition of what independent studies programs are is that we are conditioned to think in terms of content rather than process. The second thing I would like to emphasize is the definition in our very first statement which was that the student must share in the definition of the goals. That being the case, I think it further enhances our problem of trying to define our goals here.

DR. SUTER: I would like to stress that the major goal of independent study is a process to promote the development of a desirable style of learning for both current use and for the implementation of continuing learning of the physician.

DR. YEPEZ: In relation to this point I understand that the goal of the independent study program is to offer the students more time so they can work in the health services of any country. If we accomplish this we logically increase the coverage of medical care, especially primary care oriented to underserved groups such as peasants, workers, agricultural workers, and the poor. With this, we can get these underserved groups transformed within a short, medium or long term into new buyers of goods and services.

PROFESSOR McGUIRE: Thank you, we now know the goals which each of the members of the panel will be having in mind as we discuss the issues regarding resources. May I ask if there are any additional goals which members of the

conference would like to see added to the list.

DR. MANILLA: One of the goals could be that the student should be able to formulate problems, define them, and to acquire the pertinent information for their solution.

PROFESSOR McGUIRE: Are there any other goals that any of the conferees would like to see us consider?

DR. PIMENTA: I believe that a point to be considered within independent studies is the problem of curriculum. I believe that we have 3 kinds of curriculum whether we want it or not. One curriculum is what is published, very nice, very large; second is the curriculum that the teachers really teach; and the third curriculum is the one that the students learn. The independent studies give the learner freedom from the second curriculum which almost no-body knows which is crucial.

DR. HERNANDEZ: One purpose of the independent studies that has not been men-tioned and which seems to me very obvious is the intention of decreasing the costs of docent personnel.

DR. BRYANT: I don't have a goal but I have a question that perhaps you can convert into a goal for me. Dr. Trzebiatowski mentioned that the stu-dents in his program take a footlocker filled with resources and it brings to mind the objects of learning that cannot be put in a footlocker. Consider the problem of how students learn to work as members of a health team on the one hand. On the other, if they are studying a complete health care system and one wants to bring before them the elements of this system and how they interact, or relate (for example, the health center, the sub-centers and the communities around them), these don't fit in a footlocker. How can one

organize these resources to make them available for independent studies. This
is my question.

DR. TRZEBIATOWSKI: Just a short addendum to my initial comments. The
resources needed depend upon the goals of the program. The goal of our pro-
gram is to expose students to primary care. Since the majority of their
education is at the medical center level we need to take them to the community.
The community itself is a resource. Obviously you are not going to get the
community in a footlocker. However, if you take the student into the rural
areas and if they have had 16 or 20 years of educational training in an
urban center, where there are many, many learning resources such as textbooks,
then we felt that it was important that at least that kind of traditional
academic support go with them, or they are going to feel very naked out there.
That's the reason we use the footlockers.

DR. LOBO: I think that the necessary resources are going to depend much on
the objectives and goals that are to be attained, but also on the teaching
conditions. For example, if there is going to be formal teaching of the stu-
dents; if the students are going to be there, can they be grouped at certain
times? Are they going to have time available to get together to share and
discuss or are they going to be isolated and within their own areas of care
delivery?

Ideally, different formats should be produced in order to offer the stu-
dent a variety of learning opportunities so that he can select the materials
and learning opportunities according to his own style of learning. Much
depends, of course, on the available resources and then we also have to have
compatibility between the resources available, the desired goals, and the
proposed conditions of teaching.

DR. SMALL: In keeping with the present orientation, one thing that we are particularly concerned with is the development of resources that stimulate and facilitate student interaction. Basically, we would like materials that enable them to learn from one another. This naturally leads to measuring their skills in this area. That's the one process with which we are most concerned.

PROFESSOR McGUIRE: Dr. Yepez, would you care to comment on this question of what resources are needed to implement a program that will better serve and provide greater primary service to underserved groups?

DR. YEPEZ: With pleasure. To deal with the subject of resources I will pick up something that was mentioned yesterday by Dr. Mario Chavez. It seems to be one of the most important things that have been mentioned here. He said almost these same words: "The program of independent studies would try to get more time for the students so they can work in the services and learn while they work. I think that starting from there we could ask ourselves two questions and formulate two answers. First, from where do we get the time? The answer is that generally students have a fixed scheme of study for each of the different academic activities. The second question: What do we substitute the traditional academic activities with? The answer: with independent studies. It's clear then, that this change is supposed to modify quite a lot of the scheme of traditional training by utilizing new resources and thinking in new terms and by using models of curricular organization that are also different. I completely agree with the other members of the panel in that the utilization of resources is dependent upon the goals of the program. I think that the final goal of a program of independent studies is to utilize students as workers of the health services for minorities.

In my country, the entry to schools of medicine is not selective. Every student that finishes high school can enter the university. So, in Ecuador,

where there are only five schools of medicine, we have a number of students more or less equivalent to 50 medical schools here in the U.S.A. That large number of students, you can understand, must study independently and for much of their learning, they work in the health care services. Next year we'll have three thousand medical students working in the health services of the entire country, in urban areas as well as in rural areas, performing various tasks according to their level of preparation. This is a really important resource for the health services of Ecuador.

DR. WERNER: There is an additional resource we may have overlooked and that is the role of the faculty. It takes a special type of faculty member that can tolerate not knowing what students are doing every single minute, that can model this type of self-learning behavior themselves, and that are willing to be the consultant as we talked about earlier rather than the authority.

DR. MANILLA: I think that the library constitutes a fundamental resource. No independent study program can be conceived without a library, beginning simply with a collection of reference books complemented with the possibility of documentation services through the usual channels. I think that this would not necessarily imply a large collection. Unfortunately, the majority of the schools in Latin America don't have even the indispensable collection of reference books.

DR. BRYANT: I come back to my original point which is that among resources need to be those things which the student is learning. In addition to the basic science fields which often can be handled in a laboratory or in textbooks, one needs to ask about the patient as a resource, about the community as a resource, and the health care system as a resource. Independent study programs must give particular attention to the way in which these resources are arranged.

DR. TRZEBIATOWSKI: I agree with Dr. Bryant's comment. I think this is where the community coordinator's role comes in. The community coordinator is a faculty member in that community who works with the student to help him take advantage of all the community's resources. The student might need to work with the county health department. It would be this community coordinator who makes the entry for the student into the county health department.

DR. LOBO: If we inform the community physicians and the health professionals that are in the community which opportunities for learning they are expected to give the students and what the goals or performances are expected from the students, then, I don't think it is necessary to have a coordinator at the local level. The object is not to utilize the community resources for teaching. It's to make the student integrate in the health system so he participates as a member of the health team. Of course, the school can supply information resources and bibliography so the student can learn and develop his behavior.

PROFESSOR McGUIRE: Dr. Lobo, I am not sure that Dr. Trzebiatowski exactly agrees.

DR. TRZEBIATOWSKI: I agree, but I think someone needs to make an initial contact until the student becomes integrated into the system. He is not a customary visitor in small communities. He is looked at as a suspicious agent from the university and at least in our situation, someone at the local level needs an ideological orientation to the goals of the program.

DR. GUTIERREZ: I believe this will not be solved here easily because it seems to me that the whole ideological orientation of the goals and therefore the resources is at issue here. If independent study programs are directed to

educate a physician maintaining his individuality and disposition for pri-
vate practice of medicine, then this changes the whole thing. In our country,
and I'm sure that in many countries of Latin America, the goal we seek is
that the student depends totally on the health system because we are preparing
them to serve the state and the national health care system. Academicians,
teachers, nurses, sanitary inspectors, auxiliary nurses, dentists, all work
in the same health care unit or policlinic. There the student will become
part of the institutional personnel. I think that is where Dr. Lobo is
trying to express what really happens in Latin America. We prepare the stu-
dent as a person that is obliged to insert himself in the state health care
system.

DR. SUTER: It seems to me we have come across so many resources - once
we talked about the community setting. Let me propose four categories of
resources. We have talked about: 1) the student as the central resource;
2) the academic setting as a resource including the academic medical school
faculty; and 3) the community setting which has its own faculty, so to speak,
and personnel resources including the patient; and 4) the educational materials
that the students use and that the faculty puts at the disposal of the stu-
dent. In educational materials I think we have only mentioned, so far, books
and journals which are in the library and reference books in the footlocker.
There is a vast amount of material floating around the world called audio-
visuals.

DR. WERNER: Just two comments on the community setting and I would like to
propose a fifth category of resources. In the community setting, I have to
agree that a community coordinator of some sort is ordinarily required to
protect the student from over involvement in the community. If you see the

student as a worker, it is entirely probable that the student can immerse himself as a worker and never take time to study these independent resources and someone has to help him set his priorities and "run interference" as we say. The community coordinator has the broad shoulders that are required for the community people to come in and tell him how badly things are going, which happens from time to time. If that is unloaded on the student it can be completely demoralizing. The second thing about the community is that community support needs to go beyond the health care aspects of the community - the kind of thing we did in the Upper Peninsula involves the entire area through community leaders and other non-health care professionals.

My proposal for a fifth resource that we are finding more and more important is a soundly constituted and well thought out evaluation mechanism that is separated from the actual workings of the program enough to be objective but still identified enough with the program to be sympathetic.

DR. ELMORE: If the students, especially professional students, are going to perform functions with work responsibility in programs within the community, we have to consider the supervision factor. It is a legal fact that a student which has not been licensed by the proper social entity can get into a legal situation if the limits of the student's work are not identified.

PROFESSOR McGUIRE: Thank you very much. I think we are beginning to focus very sharply on the issue of the relation between the university coordination either in protecting the student and/or the public against the student.

DR. LOBO: I believe that here, once again, there is a difference between the system existing in Latin America or the possible systems, and the systems in the United States. If we talk about health systems in Latin America, we look

for developing systems that have a definite responsibility in providing total health care to a population. Then, we look to see if there is a planned system for identifying the role of the student as part of the health team. It's not to utilize the health services just so the student can go there to learn, but to work and participate in the health care of the population being served. Of course, it is the responsibility of the health service system that organized the medical care and that defined the student's responsibility to insist that supervision exists.

DR. YEPEZ: I think that what has been said in relation to the legal aspects of the practice is an important issue in Latin America, especially for groups of students that can practice and prescribe. In this sense, the student must be supported because he has the right to be supported by a licensed physician. I think that the point goes beyond what we are discussing, when we talk about using the student as a medical worker and not just designing a new pedagogical experience. It is one thing to add another pedagogical experience. This we are used to, but to introduce him as a worker brings up an issue thoroughly discussed in Latin America.

If the student joins the health team as a worker, must he earn a salary? In my country, at least, the students in their last two years do and beginning next year, the students in their last three years of medical training will have a salary. They get this salary for the services they perform. The supervision is provided chiefly by the health personnel that work in these services whether or not linked to the university or to the medical schools; but in Ecuador and other countries in Latin America many professors carry out their medical activities in the different health services and by this means, contribute to the coordination and supervision of the students.

PROFESSOR McGUIRE: I believe that I heard Dr. Trzebiatowski, at least once,
and perhaps Dr. Bryant, looking at the community primarily as an educational
resource which is serving the student. I have heard Dr. Yepez, Dr. Gutierrez
and others who have spoken, looking at the community not only as a part of
the student's education but looking at the student as a resource of serving
the community. I think I detected a difference in emphasis with various
differences in goals as well as in legal and financial concerns. Dr. Small
and Dr. Suter have both mentioned the use of independent study to serve cer-
tain process goals and to serve certain student skills, as was Dr. Manilla
in raising the question about the student's ability to define problems. Are
your goals represented in the categorization that Dr. Suter has suggested?

DR. SMALL: Well, they are. I don't know whether this will be an appropriate
time to give a specific example. We have been dealing in general concepts.
Perhaps we should take one specific example of an educational material that
addresses a process problem - namely, how to help students learn how to learn
from one another? The basic idea is to learn by solving problems, especially
problems that are in a clinically related mode. What we have been trying to
do is develop a system that forces the student to work together. We put them
in groups of four. For a class of 200 we have 50 groups of four for a labor-
atory session of two or three hours. Because the composition of the group
changes, no student ever works with the same student twice in a short period
of time. The problems are simulation packages which consist of a pretest,
which he takes, and raw laboratory data which contains about a fourth of the
information needed to solve the problem. This means he must understand the
data; interpret it; work with his follow student; share his data with them
and vice versa. When they are through with that they take an individual

post-test. We have learned that not all students interpret data appropriately or critically evaluate the data itself. The advantage of this exercise is that we can now not only quantify how much learning takes place through pre-test/post-test difference, but we can also measure how effective one student is in facilitating the learning of another student. For example, when student A is with students B, C and D, he can look at the post-test scores of B, C, and D and find that they are fifteen points better than those students normally do. If student A then goes to a second group, students E, F and G, and those students do 15 or 20 points better than they normally do, you can begin saying that there must be something about student A that facilitates learning in a group. We had a limited opportunity to collect data in this regard. In addition to collecting objective data from the post-test scores, we have the class actually vote for those students who most help them learn. We can then ask ourselves: Do the subjective measures correlate in any way with the objective measure? If you compare the objective measure with the vote measure, there is a correlation coefficient of about .19 and the probability of that occuring by chance is .02. This is with a version that had a weak post-test so that with some improvement in the post-test, we feel that it is going to become really very meaningful.

If you look at the final course exam score (not the post-test score but the final exam score) and ask how do the students' votes correspond, it turns out that there is a very high correlation coefficient with a very low probability of occurance by chance. This occurred because the students know which students are smart and they think that the smart kids are the ones that most helped them learn. Whereas, if you look at the objective measure and match it with the final exam score there is actually no correlation. This says that perhaps it is not the student who is viewed as smart because he

gets the best grades that really helps most students learn. Maybe it's the student that sits there and just says: "I just don't understand this or that, would you please tell me?" He may be facilitating more learning than anyone else.

Finally, over the next few years, we hope to be able to see how well these measures of the student's ability to interact with other students will correlate with his performance in a clinical service or setting. My hope is that this may be predictive. It requires some of the same sort of characteristics that I think the practice of medicine requires. It may be predictive of those skills and if it can be introduced into the premedicine curriculum and reviewed during the selection procedure, it may also inhibit some of the competitiveness that occurs because he will not be eliminating the competition. Instead of competing for selfish goals, i.e., how to get the best grades, we turned it around and have the students competing for selfless goals -- how best to help their fellow students. Incidently, we give, then, a prize to the student that is selected as the best helper by the students and another one that is selected best helper by the computer.

DR. BRYANT: We have been concerned both in Bangkok and New York with problems of bringing the student into interaction with the health care system which is a very large, complex, dispersed social system that changes very slowly over time. To put the student in it does not mean the student understands it. Our overall educational goal in this instance has been the following:

The first goal is for students to learn how to identify the faults of they system. The second goal is for the students to learn how to improve the systems or to design changes that improve the system and to experiment

:h different changes which one cannot do in a real life system. In order

do this we are designing a simulation of the health care system - a

mulation of a district of 50,000 people that is serviced by a small health

.am headed by a physician. The students play the role of members of the

alth team in the community. We can go through a simulation in a half day

1 which the students play the roles, participate in the dynamics of patients

oming to health centers or not coming to health centers and of being referred

rom point to point within the system. Very quickly they begin to see the

lows of the system. For example, if only the doctor is allowed to diagnose

and treat, he quickly becomes the bottle neck to patient flow through the

system.

The students, working as a group, identify the problems of the system.
Having identified and complained about the problems, they are challenged to
redesign and improve the system. They attend workshops together and come
back later with their suggestions for change of the system. Addressing the
problem of how to learn the right things from the wrong system, we have a
method of evaluating, which I won't go into now, in which students have learned
how to identify the faults in the system and how to design improvements in
the system.

PROFESSOR McGUIRE: Thank you Dr. Bryant. I am delighted that simulation has
come into this discussion. I believe that simulations are one of the most
useful types of educational material that can use any level of technology
from paper and pencil to the most elegant computer - with or without satellites
in space. Simulation is a particularly useful form of educational material
for independent and small group work. As Dr. Bryant implied, the student
can be given full responsibility in a simulation. He can do all sorts of
disasterous things either to an individual simulated patient or to a community,
and can learn without risk or danger to anyone. In preparing the students for

service in community-based settings the simulation technique might be a particularly valuable form of resource.

PROFESSOR McGUIRE: Dr. Alvarez Manilla, would you comment on the additional kinds of resources that you were speaking to me about during the break.

DR. MANILLA: I think that there is one very important thing and that is what is done with the student's time. For instance, many of the activities in the community are interferred with by time table problems. A fundamental resource is time, which can be measured in an empirical way to find out how it was employed and how it was managed. How can its distribution be improved? The other resource is space. How is it assigned and for what purpose? It carries with it certain implicit values. The availability of resources for ISP is very important; e.g., if the library is open or closed.

DR. YEPEZ: Money is a resource for almost everything and we haven't discussed it; e.g., money to pay the ISP students if they are going to be paid, and for books, journals, documents, films, slides, cassettes, and audiovisual projection equipment.

DR. VIDAL: I think another resource that hasn't been employed is investigation. As a process it is one of the fundamental instructional resources not only for the process of research itself, but as a fundamental interdisciplinary activity, I believe that many of the models that have been presented or simulations presented here can be done practically through a simple investigation; e.g., do a study of the true functioning of health services.

DR. LOBO: First, I think we are confusing resources and strategies. Of course, investigation, organization of the organizational structure, etc. are important things, but they are, in a sense, not resources. They are

strategies that we may use to achieve a goal. As one of the strategies that was mentioned is simulation, I believe personally that simulation has become one of the most important strategies that can be used in institutions. Perhaps we are not using it as much as we should. In certain areas, we tend to believe that simulation is perhaps too sophisticated. If we have the reality, why should we use simulations? Of course, simulated techniques will never substitute completely for reality but by using simulations we can better prepare the student to face the real situation. I think, also, that very often the training of students in the actual settings is, as Professor McGuire stated, dangerous for the students or for the patients. Often reality is too complex, too expensive, or not available. If the actual setting is not available, we should simulate the conditions in order to train the students. Even when reality is available and we have patients, a community, the hospital setting, etc., I think that simulated techniques prepare the students to better play their roles and develop their functions in the systems. There are different kinds of simulations which may be used to teach different things; e.g., role playing tries not to achieve cognitive objectives but mainly the affective ones. I think this is one of the most important aspects of medical education. Most medical schools do not give proper emphasis to affective objectives; i.e., values, problems of patient/doctor relationship, the relationship of the doctor and other members of the health team, and the relationship between medical students and other students as well. I believe that the many different kinds of simulations available are probably one of the most important teaching techniques we have and I predict that more and more use will be made of them.

DR. WERNER: I have to agree with you. Some basic research done at my

institution by Jack Maatsch on teaching a complex mathematical game to people that have never done it before shows that simulation is the strongest method of teaching. The next best thing is to watch someone learning by simulation. The observers of the process learn as well as the person who is actually participating in the simulation.

PROFESSOR McGUIRE: I hope the chair can be forgiven for reciting an anecdote. We also experiment a great deal at the University of Illinios in the use of simulation. Many times when people talk about simulation, they think about space simulation, or some expensive complex technology that we use only because reality does not exist, is not available, or is too dangerous. Our own experience indicates that this is not the case, but as Dr. Lobo has pointed out, simulation is extraordinarily valuable because we can select and focus on particular aspects of reality which helps better to prepare the student to face reality. Now, I have here a book of clinical simulations produced by our faculty which is a by-product of our examination system. The only expense here is paper and special markers, both of which can be obtained very cheaply.

In a two-week period last summer, we produced about 14 rather beautiful simulations that dealt with health problems including some community problems that were very much related to the problems that health professionals encountered around the world. One member of that group immediately went back home and recruited a group of students who, working together in small groups, produced their own simulations and found it a fantastically valuable learning experience because they had to decide what happens when they intervene in various ways in the problem situations that they had created. This is a way of utilizing students in an educational activity that, in turn, produces educational material for themselves and others.

DR. MANZANARES: One resource I consider of vital importance is the existence

of groups that are working for the analysis and resolution of social pro-

blems existing in the community and the problems of the medical care system

of the country where they are working. In this sense, I think that this

resource formed by a work group, which is really an integrated group formed

by students and members of the community, working toward a defined goal and

with defined objectives, whose efforts extend beyond the achievement of

academic goals to the resolution of problems that appear in the community.

DR. SMALL: I think there is another potential use of students. Students

are not just a valuable resource for teaching but a valuable resource for

producing change within the institution which believes in new teaching.

PROFESSOR McGUIRE: I am sure that we can go on with an inventory of resources

for an independent study program. I am torn at this point, because as there

is more material to cover than time available, there are three critical

issues that have to be noted in this discussion. I would suggest that we

turn our attention to just a brief explanation of these three issues. Let

us have some brief comments on each of the three issues.

The first one, I think, has to do with a subpoint in the discussion of

resources. While on the one hand we have now elaborated a great variety

of resources that we need to bear in mind, we need to lay at rest some concern

about what are the minimal resources that are required in order to implement

an independent study program. I am delighted to note that while there are

great beautiful hardware systems available, in our discussions this morning

we have not mentioned requirements for hardware. We have mentioned some

special characteristics of space - that there be some space for learning re-

sources and for students to work. So, one issue, I believe, is this matter

of needing big systems of media, of computers, of technology.

The second issue has to do with how the students actually use indepen-dnet study resources, and we have an experienced panel here that might comment very briefly on that issue. The third issue is the one that seems to me to be emerging from our more recent discussions - what are some of the problems of sharing resources? We commented that time is a unique and valuable resource and each faculty may not be able to produce from ground zero all that is required. It would seem to me a waste of resources to have each faculty duplicating the efforts of the other faculties. On the other hand, we have also called attention to the difficulty of transferring certain kinds of educational resources from one cultural and health care system into another.

DR. SUTER: The National Library of Medicine is attempting to develop an information system for sharing information about non-text educational materials. One of the principles is that there have to be established some standards that are acceptable by the learner and by the teacher. This is a most difficult task because the materials are so varied and the production takes place in the personal setting of the learner and the teacher. One task the library has set for itself, and in which the American Association of Medical Colleges is involved, is to establish an appraisal system for materials that would be entered into MEDLINE as a sub-system of MEDLINE and at sometime should become available internationally. The appraisal has to be done on three criteria.

1. Is the content valid as basic content?

2. Is the educational design useful and hopefully successful?

3. Is technical preparation of the material satisfactory?

The AVLINE system, if you are interested, is becoming available now through the National Library of Medicine, through its MEDLINE subscribers.

DR. TRZEBIATOWSKI: There is a problem in sharing instructional materials that we have come across which we call the "not-invented-here" syndrome - if members of my faculty did not develop it, it's not any good, regardless. We have gotten a grant from the National Library of Medicine to try to design instructional materials in such a way so as to be as flexible as possible. We are trying to design materials using a mini-module approach. The faculty member can unplug whatever unit he doesn't like and rearrange it in the order he would like. We are trying to see if we can get higher utilization of instructional materials.

DR. YEPEZ: My doubt is if the content identified and designed here can be utilized in Latin America, and with this I want to pick up what Dr. Aguillaume said a moment ago in terms of the possibility that our own students can be the ones who produce their own knowledge. I think this is an alternative challenge which, I don't know how to do it, but I understand then that the book, slide or cassette from foreign countries won't be useful anymore.

PROFESSOR McGUIRE: You don't only have to raise a question as to whether or not something produced in the States can be used in Latin America. As Dr. Trzebiatowski has said, we are constantly running into the phenomenon that something produced at one institution is rejected by another institution a hundred miles away or even only across the street. It is a phenomenon I find astonishing and interesting in view of our willingness to use another's textbook, or new formula for nuclear energy, or the new formula for curing a headache.

DR. SMALL: Yet, I am not sure how applicable these comments are to Latin

America. I have the hope that perhaps in Latin America the problems won't be that severe. The rejection phenomena is a very real problem in the United States. Being an immunologist, I have an immunology view of the problem and that is that we reject foreigners. If we want to have materials accepted, what we must do is have each faculty member build some of himself into them. The faculty of other institutions should modify or add to, or in some way interact with in order to gain a sense of ownership.

DR. LOBO: We have an agreement between CLATES and the National Medical Audiovisual Center in Atlanta in order to utilize the materials that are there and above all, those that have been already reviewed by the project of the American Association of Medical Schools. I'd like to tell Dr. Suter that one of the things we also did was to do, not only, an evaluation of the content of the educational design and of the technical preparation, but also the validation of the utilization of these materials in our countries. We believe that many of the programs can be utilized as they are, others could maybe be utilized in part, and others must be adapted and adjusted from the situation that exists in North America. There are those that cannot be utilized or that would not be easily utilized in Latin America. The agreement we have with the National Library of Medicine in Washington is that these evaluations would also be sent there so that they have an indication of the potential of utilizing this material in Latin America. The materials that we produce in the CLATES and the materials that are translated or adapted from the materials produced here in the United States are offered to the schools in Latin America through BIREME which is the Regional Library of Medicine of PAHO and is located in Sao Paulo. It is expected that the information the schools have about the available materials stimulates the exchange of these materials. I think it's very important to discuss the matter of

rejection of the materials produced. We try, in Latin America, to create a kind of consortium where everybody can produce something. The idea is that if someone produces something it will be easier to share what the others have produced.

The other thing I'd like to inform everybody here is that the World Health Organization is organizing a clearinghouse in Geneva to inform the schools and the regions about the instructional materials that are available.

PROFESSOR McGUIRE: Thank you. I think it is clear that life is too short and time is too precious for us to be duplicating each other's work. We have to try to move into a genuinely dynamic consortia in which persons and institutions are contributing in various ways to the development of pools of resources that can be used in such programs.

RAPPORTEUR'S REPORT
By Dr. Vidal

Summary of the Ideas of Dr. Vidal's Report

Definition of ISP

Considerable discussion was focused on developing a common understanding and definition of independent medical studies. The most unanimous explanation for ISP was presented as a comparison with a student sitting in the driver's seat of a vehicle, which allows him to participate in the formulation of goals, purposes and objectives. Thus, he is enabled to program his own speed for learning. The student is then the one who has to select and combine the resources and the opportunities for learning. The student is the one who is responsible for his own formative evaluation. The role of the teacher, then, becomes somewhat different in the ISP. His role now is understood as creating the appropriate climate (environment) for learning to occur. The teacher also is responsible for facilitating the access of the students to the instructional materials. The teacher is no longer a lecturer; he has become a consultant and role model within the independent study process.

Goals of the ISP

A second idea discussed dealt with the goals of the Independent Study Program. It was agreed that the goals are specific for each local setting and for each particular program according to the needs of each country and according to the needs of each particular region or situation. It was also mentioned that resources and goals are variables that generally go together. The resources will vary from program to program according to the goals.

Examples of goals pursued by some institutions which are mentioned regarding the application of independent study programs are:

1. To raise the community standards of health by producing physicians interested in community health care in order to meed the health needs of the community.

2. To help medical students master the basic medical sciences to a high cognitive level and to leave the basic medical sciences with a very positive attitude toward them.

3. To help support clinical learning where there is a shortage of teachers and instructional materials.

4. To provide the students with more time, so that they can participate in the real work of health care within the health services system, increasing, thus, the coverage of health problems, especially in rural areas.

5. To help medical students become independent learners by developing a capacity to formulate and solve problems and to formulate their own goals. Up to the present time the medical schools have been doing these functions for them.

6. To strengthen the motivation of the students for continuing medical education by developing the ability to self assess personal and professional weaknesses.

7. To reduce the cost of the faculty or free them for other activities such as research and patient care.

8. To develop a capacity for constructive criticism of the health system where they will work.

Learning Resources Required

Another idea discussed was the resources aspects of independent study programs. Five types of resources were identified: the students, the faculty,

the environment where the teaching/learning process occurs, the community

(patients were included in the community), and the instructional resources.

It was said that there were differences among the instructional materials

available in each situation. Some legal considerations were mentioned which

are different in each situation when the students are incorporated to the

community work. In some the financial aspect is involved in the incorporation

of the students in the community work.

Among the educational resources feasible to use in the ISP were the

study group and work group so that the students can cooperate with each other

instead of being an isolated individual. Simulation carried out in a small

group can produce excellent learning outcomes (team learning).

Other Resources

Among other resources, time, space and money were discussed as important

factors to develop and administer independent study programs. The financial

aspect was given special importance since the implementation of any program

requires the investment of money. As an alternative the idea of utilizing

the community to its full capacity was presented, so as to reduce the cost

of producing instructional material. Another alternative presented dealt

with the possibility that the students get involved in the production of

instructional materials, especially in simulations which can be the solution

to the problems of shortage of patients and materials.

Another idea presented related to the activity groups within the

communities. These are composed of teachers, students and people from the

communities. This important aspect in the educational process provides the

program with a real interaction and labels the community not just as a re-

source but as an active part of the independent study program.

Students as a resource were also discussed and they were given special importance when change is needed at the faculty level. The relationship between students and teachers was established as fundamental for the initiation and development of an independent study program toegether with other instructional material such as texts, transparencies, videocassettes, etc.

In relation to instructional resources, it was agreed that among the schools of medicine there should be the intention of sharing the available instructional materials through AVLINE, etc. The cross-cultural problem should be discussed since some schools are reluctant to adopt or to use material produced in other parts of the world, especially if there exist language and cultural barriers. The problem of royalties was also mentioned.

The idea of creating a consortium was discussed so that the faculties who produce material could exchange them with each other.

Evaluation was briefly discussed. All agreed with the importance of the quality control of the product, through flexible techniques which allow change and adjustment according to the results.

PART II - SESSION III
CURRICULUM AND PROGRAM ADMINISTRATION

DR. HERRERA: We'll begin this afternoon's session with comments by four

panelists on the topic of administration of the independent study program.

We hope that the personal experiences we will present here will be useful

to everyone.   Because we have only one hour for this session, I hope both

the panelists and members of this meeting will make their comments as brief

as possible.   We'll ask Dr. Manilla from Mexico to present us his point of

view.

DR. MANILLA: I would like to speak briefly to two topics that I consider

important.   First is the prescribed curriculum, as planned by the school and

second, experiences that are continuously emerging from real life settings.

When administering prescribed curricular programs to students, I see a

fundamental difficulty which is inherent in the curricular planning metho-

dology used in the world.   In summary, it has the following characteristics.

The methodology assumes that no student can learn anything unless he has first

been taught.   This means that the teacher has to expose something to the

student and the student has to complement it in some way by reading a text-

book and then observing demonstrations in the laboratory.

This dualism of exposition and demonstration typlifies the educational

practices in most of the schools in my country.   This creates great rigidity

because it assumes that in some way reality can be programmed.   Frequently,

this can be done in what we call the basic sciences where it is easy to

lecture on the subject and then demonstrate it in the laboratory.   But,

when we come to community programs or clinical programs it does not work like

this.   What we frequently find is that what is being taught is one thing and

what the patients present is another.   This generates a great disparity

between what is being said and what needs to be done. To solve this problem

curriculum administrators must invert the terms. That is to say, teaching

has to be planned according to what is likely to happen in the reality and

in some way to have this govern the sequence of the topics or subjects being

taught. This is especially true if it has to do with an independent study

program in which the student has to have more then the teacher as an infor-

mation resource. He has to have resources to find the information himself

and use the teacher as an assistant. To describe this process very briefly,

it means a completely new way of thinking that consists in starting from the

definition of the entering competencies that the student brings to the clinical

settings and the definition of the functions that he will perform professionally

when in actual practice.

The next step involves ordering these functions in order of complexity;

then and only then, deriving what are the learning objectives. The problem

is complex when it involves the administration of large groups of students

since each one will see different problems in the community and in the clinic.

I think that in this case it is possible to use probabilistic models to

help predict what type of event is likely to occur and with what frequency

and to try to program accordingly.

The other point I want to make, briefly, concerns the non-programmed

events which occur when a student is in a real setting. This morning, I

referred to time as a resource. If free or unscheduled time is available in

the program, then the student cannot use this resource to learn from these

elements and from important problems that are happening spontaneously. If

the student's schedule is saturated and he doesn't have the chance to go out

and work on those things that motivate and interest him, and are transcendental

to the moment, then he will lose the chance to resolve the genuine problems

that he faces. I think that this defines one of the fundamental tasks of
the person that plans and administers the curriculum. He must give first
priority to the time the student needs to get involved in problems of re-
search and learning that are particularly interesting under the circum-
stances he is facing and are not foreseen in the curriculum. I find it to
be very important to design and space so that the student can freely use the
bibliographic resources for articulating his own learning projects. On the
other hand, I think that we have to provide organized experiences so that the
outcomes of these experiences can be shared with others. I think it is
important to schedule sessions so that students can share their bibliographic
review of subjects which may not be programmed into the schedule of the
curriculum.

DR. MEYER: Thank you. I want to briefly talk about three things. First,
the University of Wisconsin's independent study program in which we enroll
30 students out of a class of 160. Our independent study program differs
from those at Ohio State and the University of Washington in that the curricu-
lum content for our independent study program and our regular program are
exactly the same. We have not been hung up on defining independent study.
Our definition of independent study is that it is an alternate way of pro-
viding learning experiences for students which has some essential character-
istics. Thus, we specify anticipated student learning in terms of measurable
behavior and we develop self assessment opportunities to enable the student
to determine whether he is progressing satisfactorily. We do not use computers.
We use the same study guides for the independent study program as the regular
program which, incidently, we are modifying only slightly for continuing
education. They have been well received by practicing physicians. The general

format of all study guides is similar. We tell each student how long we think it will take him to master the material and how long previous students have taken to study that same program. It then gives them instructions on what the instructional resources are and where to locate them. It then specifies the objectives.

Our independent study program is experimental at the moment. We are constantly introducing changes in our independent study program. Let me just cite three or four. We are going to teach gastrointenstinal disease by group discussion. We are developing instructive patients, whose responsi- bility it is to teach the students the psychomotor skills of physical diagnosis. Since we have had great difficulty getting our faculty to teach certain things,patients are being trained to do this for us. Our regular students will be used as control students and our ISP students will be used as experimental subjects. We will compare their skills after a period of time. We also have ISP students participate in interdisciplinary learning activities with physicians assistants, nurses, occupational therapists, etc. The traditional curriculum is too inflexible to permit regular curricu- lum medical students to participate in such team building activities as this. Our ISP students have regular responsibilities for patient care in our adolescent clinic and our cancer clinic which is a great motivating force in their learning. They enjoy it a great deal.

The second thing I'd like to address myself to is our preceptor program which is a very sophisticated forty-year old community-based program at the University of Wisconsin. We have clearly defined the essentials of a pre- ceptor program. They identify what is expected by both the student and the preceptor. Guidelines for evaluating preceptorships have also been identified. We use a large map of the state to locate each student and identify the type

or preceptorship he is in; e.g., a family medicine group practice clinic.
Our program evaluation consists of three parts. One, using standardized
and validated forms, the preceptor evaluates the performance of the student.
Two, again using standarized forms, the student evaluates the preceptor and
then our Madison-based faculty visit and evaluate both students and preceptor
at the community site. The success or failure of the program is determined
using this data. We know our program is very successful

A final point which may be of interest is that we are trying to use
independent study methods in our continuing medical education programming
by trying to persuade our physicians to choose the ways in which they learn
best for their own continuing education.

DR. VIEIRA: Many of the methodological difficulties that we have encountered
during our discussions derive from the various conceptual problems that have
not yet been solved. It is clear to me that there are two different ways
of viewing the problem of education in the health professions. In the past,
when we heard about preventive medicine, community medicine, teaching hospitals
and of other movements in medical education, there was an almost automatic
propagation of the models in this country and in other countries of Latin
America without an analysis or critical review of what these models repre-
sented or what content could be used or could be useful. They were used or
adopted without profound discussion.

I believe that now with the presence of at least two major positions,
it can be seen that the situation has changed with respect to the identifica-
tion and clarification of the major problems of the health professions faced
by our American colleges and the major problems we have in Latin America.

As in the past, it is possible that we are witnessing the rise of a critical mass of indivduals in Latin America who are interested in analyzing the assumptions controlling what is going on in Latin American medical education. Our basic differences in viewing the problems of medical education were well discussed and covered in our meeting and I shall not return to them; however, I insist on the development of an independent position for viewing the education of professionals in the health area, on the side of the schools of medicine of Latin America.

During the morning we saw a clear difference, for instance, between what we call a community-based program and Drs. Bryant and Werner's experiences of getting students into the community which is a very academical, well protected way, following a model, which to a certain extent reproduces what a microbiologist does; i.e., to reproduce in vitro some natural situation. This kind of initiation of the student into the community represents nothing but a reproduction of the academic environment with all the limitations that the academic environment has, e.g., the way of viewing society that the university brings, the reproduction of artificial conditions, and conclusions that can be seen in the society. On the other hand, there are examples of situations developed in Latin American schools in which medical students have an opportunity to learn from the real and concrete practice in a real situation.

I believe that independent studies as a new idea or set of propositions in medical education, to a certain extent, is something that existed for a long time. Now, possibly, it has been given a name but all of us have studied by ourselves in some way or another. We have studied by ourselves using whatever resources we could possibly get. In Latin America this is a very clear and very concrete situation for many of our countries. I

remember a poll carried out by the students of a medical school who had been

chosen for medical residency and were considered as the elite of the gra-

duates of that year. Among these students it was reported that 85% of all

the knowledge that the students learned was learned outside of the academic

environment while practicing in some real situation that they themselves

had found. Therefore, it is very clear that in many cases in our countries

what is seen in an academic situation is nothing more than a graduation

ritual, or a serial that is being shown during the years. One gets a diploma

to practice a profession which was not learned in the academic setting. Even

this morning when it was pointed out that independent studies, to a certain

extent, make the student independent from the teacher and make more feasible

the study and learning of the third curriculum mentioned by Professor

Pimenta, I had my doubts because I do not know to what extent this is not a

way of programming what the students are going to do in their spare time.

If I see a society running in a general way, in which all the activities are

under institutional time control, then I don't know. It seems to me that

there is a sort of contradiction in the sense that independent studies give

independence to the student from the teacher. But, on the other hand, inde-

pendent study takes the student's time and gets him dependent on other sorts

of things that are programmed and then presented. I believe that for us in

Latin America, the matters we have discussed here and conclusions drawn at

these sessions must continue in a critical, indepth and objective way.

DR. SCHWARZ: I would like to share with you an overview of a program that

we have in the northwestern part of the United States which is called the

WAMI program. WAMI stands for four states in the Pacific Northwest (Washing-

ton, Alaska, Montana and Idaho). These states represent about one quarter

of the land mass of the United States and has cities separated by distances

greater than from Los Angeles to New York City. We have 6,000,000 people and

it is a very beautiful part of the United States.

There are four or five major health problems which we are attempting

to address in the WAMI program. One is that we have more qualified stu-

dents that want to study medicine than we have positions in our medical

schools. There is a significant amount of political pressure to increase the

class size and to admit more students.

The second problem is that we have too few physicians who are delivering

first contact or primary care to families in the region.

A third problem is that we have a poor distribution of the practicing

physicians relative to the population. For example, in the state of Mon-

tana, 85 percent of the physicians are in urban settings and only 55 percent

of the population are there. Alternatively, only about 15 percent of

physicians are in rural areas when nearly half of the population is rural.

Our fourth problem is that it is enormously expensive as we all know to

build new medical schools. Because funds were not available, the option of

building a new school to meet the problems that I just outlined were not an

option we had open to us. The only way we, the University of Washington,

School of Medicine, could grow was to use a number of unique resources that

don't exist anywhere else in the region.

The fifth thing that we wanted to attack was how to get health care

resources to the communities that had need of them. The goals of the WAMI

program are straightforward. We increased the number of students in training.

We are training more primary care physicians and placing them where they are

needed. We attempted this in two ways. The first is the University's part

of the program. We are presenting the entire first year of our medical school

curriculum to students at four universities that do not have medical schools.

One-third of our entering class is taking these remote courses, which are

nearly identical to the ones that we present at the University of Washington

at university sites that are as far away as Montana State University or at

Fairbanks, Alaska, which is 2500 miles from Seattle. In short 72 out of

175 students spend the entire first year away from the medical center in

Seattle. The only difference in the curriculum is that we require students

to spend at least one-half a day a week with a preceptor. A preceptor is

a practicing physician who tries to explain to the young student what it is

that he does, how he functions in the health care team and what sort of rules

the student is going to have to live by if he opts for this type of pro-

fessional expression. It turns out this is the most popular course of the

first year students. They spend a minimum of one day a week, eight to ten

hours a day, and some spend considerably more with the preceptor. If there

is an independent study in the curriculum in our first year, this is it.

We also want to expose our students to the geographic and climatic con-

ditions which act as a barrier to delivering health care; e.g., in Fairbanks,

Alaska, it frequently gets to 74 degrees below zero which poses an enormous

barrier to delivering health services. Another thing that happens in the

winter in Alaska is that as the earth's axis rotates, the magnetic field

falls down over Alaska and interfers with radio signal transmission so you

can stand on a building and wave your arm and somebody down the way can see

you, but if you try to contact him with the citizen band radio, he cannot hear

you.

In Alaska they spend their time with a practicing physician who takes

the students into very small villages of 150 to 200 people. Last winter we

had two students trapped for seven days in a village with winds up to 60 miles per hour and temperatures of 60° below zero, and I can assure you that this experience made an impact on them relative to the barriers of delivering services in the north.

Once the first year is over, the students return to the city of Seattle where the medical center is located. There they see things which they will not see out in the rural parts of the country. They join their classmates who had the first year of their curriculum in Seattle and then take the second year of their studies. At the end of the second year, they are required to choose one of the four pathways which they wish to follow. These pathways are clinical medicine for internal medicine, pediatrics, obstetrics/gynecology; the surgery and related disciplines pathway; a medical science pathway for those who are interested in the academic career; and the family medicine pathway which has its emphasis on primary care. Interestingly enough, before we started the family medicine department and the family medicine pathway, we had seven percent of our students going into family medicine. This figure has risen to 42 percent of the members of each class going into family medicine. Those students who started medical school away from the medical school in Seattle are choosing family medicine by a ratio of two to one compared to their colleagues who started in Seattle. Whether it is because of pre-selection or the community-based experience, we don't know, of course; but something has happened because the students are choosing the family medicine pathway.

The second phase of the WAMI program begins when the student reaches his clinical clerkships. We established, in contrast to what Wisconsin has done, formal clinical clerkships in communities throughout the four states. These are not hospital-based experiences; they are office-based experiences. The

students have the privilege of following the patients into the hospitals,

but the hospital is not the primary focus. Their focus is in the community

where the physician spends most of his time - namely in the office and

making house calls, etc. The student becomes part of the team by developing

his or her own panel of patients and making first contact with them. There

is no series of residents, interns and more senior students between them and

the patients as there is in the university's teaching hospital. The stu-

dent adapts relatively quickly to being a part of the team. We have three

general goals for this community-based program. One relates to improving their

medical knowledge and technical skills. I won't take the time to describe

them. A second relates to understanding the community. What agencies and

organizations are available to the doctor to help him delivery care? What

human resources exist in the community? How do they function? What are the

dynamic roles the doctor must play besides simply prescribing medicine and

treating the sick?

Finally, besides improving their skills and knowledge base, under-

standing the community as to how it functions and how it is structured,

and their roles in it, we also want them to know how to set up a system of

health care in a community. They need to know what is needed in terms of

office space, record keeping, malpractice insurance, etc. We call this our

practice management goal. Again, there are three goals. One is the

traditional goal of facts, skills and application; the second is community;

and the third is practice management. This is our primary strategy for

getting physicians to go to communities where they are needed. We send along

with the resident or the medical student their spouse because we believe

that if the spouse doesn't like the community, the couple will leave the

community or they will separate. Either way is undesirable. The spouse goes

along for six weeks to six months depending on the experience.

I should add that as the faculty goes out to the unit, they review the progress of the student and resident; they serve as consultants to the physicians in the area and they set up formal continuing education programs for health professionals that are practicing in the area so that the doctor's office, in essence, becomes a mini-medical center for continuing education.

I would like to add that the student makes his own decision to take his entire exposure to pediatrics, to psychiatry, and to obstetrics in the community as he can elect to have the same exposure at the home base in Seattle.

In order to run a program like this from an administrative standpoint, we do a lot of traveling. We support the airlines very well. This costs money, is fatiguing and is inefficient so we became very interested in the possible use of a communication satellite in order to avoid travel and still accomplish our communication goals. We began using a satellite which was launched in May of 1974. It has the capability of not only talking two ways simultaneously, but it also had the capability of transmitting color television two ways simultaneously. We used this capacity in a number of ways; for example, our admissions committee conducted admissions interviews of candidates in Fairbanks, Alaska. We were able to remotely teach courses and demonstrate patients and laboratory procedures, etc. The student could interrupt at any time and ask questions. With the two way video we could dialogue back and forth and could communicate verbally as well as non-verbally. The picture resolution was such that you could see the fine stitching on a shirt. We also did some health care experiments. A dermatologist, for example, was in the studio in Seattle while the patient and a physician were 2500 miles away in Fairbanks where there are no dermatologist. The dermatologist could look at the lesion that was affecting the patient, make a

diagnosis, suggest treatment, and then do follow ups. We also did indi-
vidual grpup psychotherapy; we did medical consultations; and we did
emergency medical consultation among other things. Finally, we had our
students in Fairbanks, Alaska , via the satellite, access the independent
study program on Ohio State's medical school's computer simply as a demon-
stration to show you could cover a great distance and cross geographical
barriers and still have instantenous interactive computing capabilities.

We have been active about five years now and you'll remember that our
first goal was to increase the number of students admitted to the University
of Washington medical school. Compared to the years before the WAMI program
with the years after WAMI, we had a 67 percent increase in class size.
Using measures of comparative performance, the final analysis of our data
shows that there is no significant difference between the traditional pro-
gram and WAMI's community-based program. We do not feel that we are jeo-
pardizing the quality of their education in spite of the fact that we had a
two-thirds increase in our class size. Secondly, if you compare the three
years before WAMI and the four years since WAMI in terms of the number of
students expressing an interest in becoming primary care physicians, you can
see that we had a 40 percent increase in the number of students who are
expressing interest in primary care which includes family medicine, internal
medicine, pediatrics or obstetrics/gynecology. We think we are on the way
to meeting goal number two.

A third goal is to bring the research findings of the medical center in-
to communities. One way we have done this is through continuing education.
Last year our continuing education courses held in the field contacted nearly
4,000 people, 85 percent of which would not have had access to continuing
education. We have also set up a telephone consultation network for any

physician in the four states so they can call the medical center with a problem and get instanteous back up. Twenty-two percent of our referrals are coming from physicians involved in our educational units, and as a consequence, a number of patients in our trauma center, burn center, cancer center, and neonatology center are from the outlying areas.

Finally, where are our graduates going into practice? We have data only through July of 1975. We have only 35 persons who have gone through the program and are now in practice. Forty-five percent or 16 of them are in towns of less than 5,000 people. Another 15 percent are in towns of 10,000 people and the remainder I distribute across four or five other categories. This is obviously too small a number to draw any firm conclusions. I would risk misleading you if I said that this result was solely due to the efficiency of the WAMI program. The whole social milieu is changing; e.g., the presence of family medicine departments, the National Health Service Corps, etc. All of these things are contributing to these results which I'm reporting here, but as long as it gets them where they are needed, we are willing to be a part of it.

DR. HERRERA: Thank you, Dr. Schwarz, for your stimulating report. Questions? Please.

DR. LOBO: Do you believe that the interaction carried on by using the satellites, as compared for instance, to a demonstration of a patient or showing a clinical problem recorded on a cassette, will justify increasing the cost.

DR. SCHWARZ: My general impression from the things we have done with the satellite are that if you are only interested in one way transmission, then

you don't need the satellite for teaching purposes. The real thing the satellites offer you is interaction and if this is not what you are trying to accomplish, then you don't want to bother with satellites.

Regarding the additional costs, I've seen some projections of cost made that will make it cheaper than using a telephone line. Under those conditions with a very large population using it, then it would be cost effective, and I think you would find a great deal of savings using it; but we are obviously a few years from that at this point.

DR. HERRERA: If there are no other questions, I will ask Dr. Small to summarize the session. Dr. Small.

DR. SMALL: Thank you. I think I will be particularly brief in light of the hour. Dr. Alvarez Manilla began by contrasting the classic program in which the teacher presents facts to the student and the student reinforces these facts by studying texts and experimenting in the laboratories. In an independent study program it is the problem of the moment that controls the content to be learned. I think it is the contrast between the two systems that illustrates the difficulties that one faces in an independent study program.

Dr. Meyer then proceeded to describe the three different independent studies programs at the University of Wisconsin. The first was the introductory independent study program with its thirty students out of 160 and its use for curriculum innovation. I was particularly fascinated by the concepts of using the patients from the alcohol detoxification unit for history taking and that nursing homes were used for teaching physical diagnosis. I thought this to be an imaginative use of community resources. Second, he described their community based preceptor program which has forty

years of experience. Third, he described the continuing education program

which was related to the preceptor program. I thought about the important

point we made the other day which was that preceptor programs are perhaps

the only proof of effective continuing education that we have at this

point in this country. In the United States, continuing education is one

of our largest problems and one that we deal with least effectively. To

think of the preceptor programs in that context makes them worthwhile.

Dr. Vieira went on to speak of some of the potential problems which

could stem from utilization of resources in an environment from the environ-

ments from which they were drawn. I particularly like his contrast of

community-based programs and the in vitro community-based programs that some

of us talked about for want of access to the real thing in contrast to

the in vivo programs that some of our Latin American colleagues are using

effectively for teaching medical students what life is really like and what

the practice of medicine will really consist of. He made a plea for

objective and critical review of whatever materials and concepts are taken

by a group from another group and expressed some concern over the possibility

that what may be taking place is a change from a dependence on a professor

to perhaps a dependence on materials and material producers.

I found the approach of the WAMI program, the definition of problems that

their society was facing and the response and evaluation of the program

imaginative. I found particularly interesting Dr. Lobo's question about the

satellite and its potential long range use. As always, it is a question of

the impact of technology and at what point we all should become concerned.

When does it cease to be the play thing for a small research group and become

a meaningful part of all of our lives? This is such a critical question.

It was at least as fascinating for me to be forced to think about it and

what impact it could have as to try to anticipate on what time scale will
be required before it becomes a much more important issue in our lives.

DR. HERRERA: Thank you, Dr. Small, for that excellent summary and my
thanks to all the members of the panel.

SESSION IV
CONFERENCE SUMMARY

DR. FULOP: We have just opened Session IV - the summary session. I will

first like to ask Dr. Teruel for his summary.

DR. TERUEL: I think that medical specialists in active practice could make

a greater effort to bring important matters to the attention of students.

I think that besides the obvious medical problems to be treated, there are

things from the environment that the students need exposure to. There is

also something very strong that affects the development of professionals.

I have seen, for example, pediatric courses where the teacher is very able,

has a well developed learning program and the student that goes to his

class, after sometime is able to diagnose and treat in children. And he

does this very well. He is able to give very adequate orientation in

medicines, prescription and the essential things necessary for treatment,

etc. This is considered to be a good program. The teacher is liked by the

students and they learn a lot from him. But this professional in his pri-

vate office in front of a sick child with his concern for transmitting and

facilitating the learning experiences of the medical student with him lacked

a concern for the line of children and mothers that he saw and for those who

couldn't be assisted that day in the hospital and in outpatient wards.

I have the impression that there is another dimension missing in this type

of teaching. I observed that the student was going to acquire the control

and knowledge of the methodology which he would need to practice in the

profession, and would have a reasonable idea of how the professional behaves

in that country in private clinics concentrated in urban nations and in areas

that offer a little more comfort and are not at all concerned with improving

the health of all children or people of that country. I think that the

services of the system are the "teacher" and it's the teacher who determines the result of learning. We can continue to discuss within our educational field or medical field the academic aspects, but we also have to be more concerned about this other dimension and try to identify it with the appropriate system principles. If this is something in the air in the environment where the students are encouraged to talk a little more with the mother, but he doesn't do it because he is worried that there are more patients waiting and knows that there are others which couldn't even make it to the hospital. And this conflict is something that is always openly discussed. This will give another characteristic in his life and in his worrying also. The way to do it is something to reflect upon. These are some of the factors which for me are important and I think that have to be included when thinking about any teaching method in which independent study programs may facilitate.

Concerning evaluation issues, for instance, we can't be satisfied evaluating the final product. Evaluation will have to be in the future. When there is a general improvement in the health of the people, the people feel good and there is satisfaction with the health care system. Then I can say that the personnel are well prepared and are producing a real effect. We have to worry more about the population's health, the physician's health, the teacher's health, in order to facilitate the emphasis put by Dr. Jason.

DR. FULOP: Thank you Dr. Teruel for your summary which was a plea for more effective unity orientation. Now I would like to turn to Dr. Trzebiatowski for his summary.

DR. TRZEBIATOWSKI: Thank you, Dr. Fulop. I think it has been a very

exciting conference and to try to summarize everything that was said is a very difficult if not impossible task. Nevertheless, I'll try to identify some of the highlights.

Independent study is a break from tradition. This point was one of the things that kept running through our conversations. One of the things we talked about very early was the realization that medicine is a reflection of the social purposes and the needs of a society in a given time in its history. We talked extensively about the fact that any single educational effort is not likely to solve all the health care problems of a given society.

Speaking now in terms of students, the type of student you admit into medical school very much determines the type of physician who comes out. With independent studies, new medical education goals are possible. This is probably the most exciting part of breaking from the traditional patterns of education. Many of these goals are non-medical in their intention. These goals are very diverse. This point was made over and over again. We need to look at both the individual and the group needs of our individual countries and begin to design our educational programs to train physicians who will more directly fulfill these needs. Clearly in an independent study group, faculty roles change. It is a shift from an emphasis on the faculty member as expert to faculty member as mentor, as tutor, as guide, as counselor. It is also very clear that in an independent study program, students' roles change. A student's work becomes much more self-directed and he becomes much more responsible for his own education; he is responsible for his peers; he can even be responsible for teaching his teachers; he becomes a health care worker if you take him into the community and becomes a part of the health care system. Probably the best way to learn about health care systems is to become an active, productive part of one. Independent studies then makes it possible

to conduct training and education in non-traditional settings.

Another point we have talked about is the evaluation of independent study programs. We seemed to agree that evaluation is a dynamic kind of process beginning from the first day of the program and extending throughout the entire process. Almost everyone involved in independent studies, students, faculty and community people, are always involved in the evaluation process. One point that was expressed that I thought was rather interesting was that the student would be trained as a change agent, or an agent of change which is something that I have not heard talked about very much in other contexts.

We also talked about materials to support students in their efforts to master the expected learning outcomes and it soon became obvious that there is a tremendously wide variety of materials that could be used for this purpose. Some involve self-instructional material to support the student who will work alone. Others are more traditional textbook type materials which we have been using for a long, long time. Textbooks are the primary learning resource and we could add hardware of all kinds but it is not really necessary. Simulation came out as having great potential. I fully agree with the conclusion that simulation has tremendous potential for improving medical education.

Finally, I think that perhaps the bottom line is that independent studies puts the students in the driver's seat and puts much more respon-silbity on them. Independent studies have many uses but we must take a critical look at it in terms of the goals of our programs.

Personally, it has been a pleasure for me to be part of this conference and I have learned a great deal. I believe I have undergone some faculty development.

DR. FULOP: Thank you, Dr. Trzebiatowski. I think that these two summaries are really good and were a beautiful way to end the conference because the second summary, at least for me, summed up again the potential of independent study programs. I fully agree with Dr. Tereul that medical education cannot continue as it has in the past which, at least the majority of schools, are doing. There are a few very interesting experiments that, as we said, cannot continue as arbitrary isolated experiments. The rest of medical education must change and take into account the needs and demands of the people. Let's hope that independent study programs which are a very interesting and promising tool will be used for this change and let's hope that not only students will be changed but professors as well. I believe that all those who participated in this conference have changed and this is unusual because most people leave conferences like this much as they came in.

Finally, I would like to express thanks for the organizers of this important conference, to the PanAmerican Health Organization, to the Association of American Medical Colleges and to Ohio State University. I would also like to thank all the participants for their active participation and to the secretarial staff which was very efficient. Finally, many thanks to the interpreters without whom this conference would have not been possible. Thank you very much.

APPENDIX

CONFERENCE PROGRAM

OPENING REMARKS AND CONFERENCE REVIEW

Dr. Hector R. Acuña . . . . Pan American Health Organization
Dr. Emanuel Suter . . . . Association of American Medical Colleges
Dr. Gregory Trzebiatowski . . . . The Ohio State University

PART I: INDEPENDENT STUDY AS A MEDICAL EDUCATION INSTRUCTIONAL METHODOLOGY

Session I: Dr. Jose Roberto Ferreira (Chairman)

   The Conceptual Framework (I): The Health Care System and Education
   by Dr. Juan C. Garcia   (Editor's Note: Dr. Garcia gave a visual pre-
   sentation. A written summary did not adequately convey the
   critical information and is, therefore, not included in the
   proceedings.)

   The Conceptual Framework (II): Independent Study Programs by
   Dr. Jose Manuel Alvarez-Manilla

   Discussion and Clarification of Dr. Alvarez-Manilla's Paper

Session II: Dr. Frank T. Stritter (Chairman)

   Learning Styles and Mastery Learning by Dr. Luiz Carlos Lobo

   Discussion and Clarification of Dr. Lobo's Paper

Session III: Dr. Jorge Haddad Q. (Chairman)

   Evaluation of Independent Study Programs by Professor Christine McGuire

   Discussion and Clarification of Professor McGuire's Paper

Session IV: Dr. John H. Bryant (Chairman)

   Faculty Role in Independent Study Programs by Dr. Hilliard Jason

   Discussion and Clarification of Dr. Jason's Paper

Session V: Dr. Mario Chaves (Chairman)

   Curriculum Organization and Administration of Independent Study
   Programs by Dr. Gregory Trzebiatowski

   Discussion and Clarification of Dr. Trzebiatowski's Paper

General Discussion of Independent Study as a Medical Education Instructional
Methodology

PART II: INDEPENDENT STUDY PROGRAM IN THE HEALTH CARE SYSTEM

    Session I: Dr. Jose Roberto Ferreira (Chairman)
                Dr. Thomas C. Meyer (Rapporteur)

        Interrelation of Education and Health Care Delivery for Independent
        Study Program

        Panel 1:   Dr. John H. Bryant
                Dr. Mario Chaves
                Dr. Rodrigo Gutierrez Saenz
                Dr. Paul Werner

    Session II: Professor Christine McGuire (Chairman)
                Dr. Carlos A. Vidal (Rapporteur)

        Resources and Support Services for Independent Study Programs

        Panel 2:   Dr. Luis Carlos Lobo
                Dr. Gregory Trzebiatowski
                Dr. Emanuel Suter
                Dr. Rodrigo Yepez

    Session III: Dr. Vidal Botelho Herrera (Chairman)
                Dr. Parker Small (Rapporteur)

        Curriculum and Program Administration in Independent Study Programs

        Panel 3:   Dr. Jose Manuel Alvarez Manilla
                Dr. Thomas Meyer
                Dr. M. Roy Schwarz
                Dr. Ceasar Augusto Vieira

Session IV: Dr. Thomas Fulop (Chairman)

    Summary Session: Independent Study Programs, Present State-of-the-
    Art and Its Potential Impact on the Health Care System

    Dr. Gregory Trzebiatowski
    Dr. Jose R. Teruel

CONFERENCE PARTICIPANTS

Dr. Claude Aguillaume
Medical Specialist
Population Division
The World Bank
Washington, D.C., USA

Dr. John H. Bryant
Director
School of Public Health
Columbia University
New York, New York, USA

Dr. Mario Chaves
Program Director
W. K. Kellogg Foundation
Battle Creek, Michigan, USA

Dr. Miguel Angel Dominguez
Professor of Preventive Medicine
Facultad de Medicina
Universidad de Yucatan
Merida, Yucatan, Mexico

Dr. Jorge Haddad A.
Chief
Division de Desarrollo de
   Recursos Humanos
Ministerio de Salud Publica
Tegucigalpa, Honduras

Dr. Hector Hernandez
Professor of Social Sciences
Universidad Autonoma Metropolitana
Unidad Zaragoza
Mexico, D.F., Mexico

Dr. Vidal Botelho Herrera
Director
Oficina de Educacion
Facultad de Ciencias de la Salud
Universidad Mayor de San Andres
La Paz, Bolivia

Dr. Hilliard Jason
Director
Division of Faculty Development
Association of American Medical Colleges
Washington, D.C., USA

Dr. Jose Manuel Alvarez Manilla
Director
Escuela Nacional de Estudios Profesionales
Unidad Zaragoza
Mexico, D.F., Mexico

Dr. Jaime Manzanares
Professor of Preventive Medicine
Facultad de Medicina
Universidad Autonoma de Nicaragua
Leon, Nicaragua

Dr. Christine McGuire
Associate Director and Chief
Research and Evaluation Center for
   Educational Development
College of Medicine
University of Illinois at the Medical Center
Chicago, Illinois, USA

Dr. Thomas C. Meyer
Director, Independent Study Program
Medical School - Center for Health Sciences
University of Wisconsin
Madison, Wisconsin, USA

Dr. Aloisio Pimenta
Chief, Staff Development Section
Inter-American Development Bank
Washington, D.C., USA

Dr. Luis Alberto Reyes
Professor of Internal Medicine
Facultad de Ciencias Medicas
Universidad de Asuncion
Asuncion, Paraguay

Conference Participants (Continued)

Dr. Rodrigo Gutierrez Saenz
Dean
Facultad de Medicina
Universidad de Costa Rica
San Jose, Costa Rica

Dr. M. Roy Schwarz
Associate Dean and Director
W.A.M.I. Program
School of Medicine
University of Washington
Seattle, Washington, USA

Dr. Parker Small
Professor Microbiology
College of Medicine
University of Florida
Gainesville, Florida, USA

Dr. Frank T. Stritter
Associate Professor
The School of Medicine
The University of North Carolina
Chapel Hill, North Carolina, USA

Dr. Emanuel Suter
Director
Division of Education Resources and
  Program
The Association of American Medical Colleges
Washington, D.C., USA

Dr. Dagoberto Tejada
Professor of Social Sciences
Facultad de Ciencias Medicas
Universidad Autonoma de Santo Domingo
Santo Domingo, Republica Dominicana

Dr. Gregory L. Trzebiatowski
Associate Dean for Medical & Graduate Education
College of Medicine
Ohio State University
Columbus, Ohio, USA

Dr. Ceasar Augusto Vieira
Programa de Preparacion Estrategica de
  Personal en Salud (PPREPS)
Organizacion Panamericana de la Salud
Brasilia, D.R., Brasil

Dr. Paul T. Werner
Medical Director Preceptor
Upper Peninsula Medical Education Program
Bay de Noc Family Health Center
Escanaba, Michigan, USA

Dr. Rodrigo Yepez M.
Director
Centro Nacional de Investigcion
  Medico-Social
Ministerio de Salud Publica
Quito, Ecuador

PARTICIPANTS FROM PAHO/WHO

Dr. Hector R. Acuña, Director
Dr. Charles L. Williams, DD
Dr. Eusebio del Cid Peralta, AD

Dr. Thomas Fulop, Chief, HMP/Geneva

Dr. Pedro N. Acha, DC
Ms. Mary H. Burke, SS
Ing. Frank Butrico, EH
Dr. Jose L. Garcia Gutierrez, HS
Dr. Richard A. Prindle, FH

Dr. Jose Roberto Ferreira, HR
Dr. Edmundo Elmore
Dr. Juan C. Garcia
Dr. Derek T. Goulden
Dr. Luiz Carlos Lobo
Dr. Juan V. Pillet
Ms. Una Reid
Dr. Jose R. Teruel
Ms. Olga Verderese
Dr. Carlos A. Vidal