Doctoral Dissertations 1896 - February 2014

1-1-1972

# The flexible curriculum :: a practical experiment in restructuring higher education.

Philip R. Christensen
*University of Massachusetts Amherst*

Follow this and additional works at: https://scholarworks.umass.edu/dissertations_1

THE FLEXIBLE CURRICULUM:
A PRACTICAL EXPERIMENT IN RESTRUCTURING
HIGHER EDUCATION


A Dissertation Presented

By

PHILIP R. CHRISTENSEN


Submitted to the Graduate School of the
University of Massachusetts in
partial fulfillment of the requirements for the degree of

DOCTOR OF EDUCATION

July 1972

Major Subject:   Education

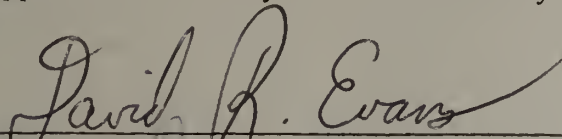THE FLEXIBLE CURRICULUM:
A PRACTICAL EXPERIMENT IN RESTRUCTURING
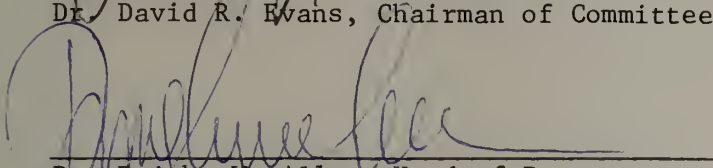HIGHER EDUCATION


A Dissertation

By

Philip R. Christensen



Approved as to style and content by:
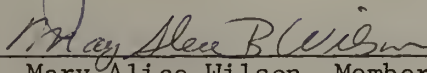
_____
Dr. David R. Evans, Chairman of Committee

_____
Dr. Dwight W. Allen, Head of Department
and Member

_____
Dr. Mary Alice Wilson, Member



July 1972

Filmed as received

without page(s)_____iv_____.


UNIVERSITY MICROFILMS.

The Flexible Curriculum:  A Practical Experiment

in Restructuring Higher Education.   (July 1972)

Philip R. Christensen, B. A., Harvard College

Directed by:  Dr. David Evans


Since 1968 the School of Education at the University of Massachusetts

has been committed to innovation through alternatives.  The formal

educational system in the United States is based on a set of unquestioned

assumptions which have locked schools into a single way of doing things.

No one knows whether traditional approaches to teaching and learning

are the best or the worst possibilities.  At the moment, they are the

<u>only</u> possibilities.

Resolution of the problem requires two things:  the vision to

imagine and define new educational techniques, and the courage to test

them even at the risk of failure.  This has been the School's basic goal.

The Flexible Curriculum is but one of the alternatives produced by this

endeavor.  It is certainly not the most radical, for it shares some very

basic features of the existing means of packaging instruction.  Yet it is

not a trivial modification, either.  By expanding on the simple expedient

of dividing credits into smaller modules of credit, the innovation adds

previously unrealized flexibility to the options available for faculty,

students, the community, and the institution itself.  Curricular format

can be determined by content and individual aptitudes, instead of content

and aptitudes being strictly constrained by format.  Furthermore, a

carefully planned administrative system allows such freedom within the larger context of a traditional credit system. The translation of modular records into regular course numbers and credits means that this alternative is available to all institutions of higher education ready for change but unwilling to rush into a radical break with the past.

"The Flexible Curriculum: A Practical Experiment in Restructuring Higher Education" is a written description of a project dissertation. It is divided into two major sections. Chapter One is general background. It includes a historical perspective on the credit system in American Education, an overview of the mechanics of modular credit, an analysis of the idea's advantages and disadvantages, a discussion of its development at the School of Education, suggestions about the concept's curricular implications, and proposed evaluation mechanisms. Chapter Two gives a detailed description of how the Flexible Curriculum is organized and administered. In essence, it is a blueprint for change. In its entirety, the document offers a plan for a workable structural alternative in higher education, one that shows promise of improving the quality of teaching and learning at this level.

CONTENTS

ACKNOWLEDGMENTS

Rarely is a traditional research dissertation solely the result of one person's labor. Many individuals contribute, directly and indirectly, to the final product. This is even truer in the case of a project dissertation. I have had the good fortune to play an active role in initiating the Flexible Curriculum and in supervising its development. This document and whatever errors it may contain are my responsibility, and mine alone. Yet the endeavor as a whole has benefited from the creativity and hard work of many people who should be acknowledged at the outset.

First and foremost, I would like to thank Dean Dwight Allen of the School of Education. As a professional, he has repeatedly offered me the benefit of his expertise, widening my vision when it was threatened by the limitations of day-to-day "administrivia" and restraining my inexperienced enthusiasm when the reality of university affairs needed to be served. As a friend, he has constantly given me sincere encouragement and support. As a person, he has been a superlative example of a true educational leader.

Next I wish to acknowledge those individuals of the modular credit staff who have worked side by side with me for more than a year, dreaming a dream and making it a reality: James Algina, George Bryniawsky, Maharukh Khambatta, Ken Linden, Kathleen McGuire, Patricia Crowley Mitchell, Karen Sells, and Jerry Tomas. It is encouraging to know

that this project has produced not only a viable innovation, but viable friendships as well.

Third, a very special thanks is due to Associate Dean Earl Seidman and the staff of the School of Education's Academic Affairs Office, especially David George, Carol Leslie, and James Healy. These individuals have contributed so much guidance and energy to the Flexible Curriculum that it has often been difficult to see where Academic Affairs ended and modular credit began. Many times their support has meant the difference between success and disaster.

Next, I wish to note the contributions of those faculty members who have given their time to my work in service on various guideline and examination committees. Chief among them is Dr. David Evans, who has chaired all of these bodies. Working with him have been Dr. Mary Alice Wilson, Dr. Robert Woodbury, Dr. Glenn Hawkes, and, of course, Dr. Dwight Allen. In helping me prepare for my doctorate, they have helped the Flexible Curriculum, too.

I also want to pay special tribute to the many members of the University administration who, in spite of occasional honest disagreements, did their best to help with the project. There is not enough space to mention all of them; two examples must suffice. One is Mrs. Helen Perry of the Registrar's office, who played a major role in initially developing modular credit and has remained a supporter ever since. The other is Russ Kraus of the Provost's office, who has objectively and in good humor guided us around many roadblocks.

The Carnegie Corporation of New York has provided the funding which made our planning work possible.  It is certainly appropriate that a name linked with the original credit system when it was still an innovation should now be associated with another alternative in the structure of education.

Finally, I want to thank my wife, Deborah, who put a ring on my finger but found that she had married a project, too.  Needless to say, her support has been the most important of all.

# INTRODUCTION

Modular credit involves the division of a standard credit unit
into mini-credits, thereby allowing recognition of atypically scheduled
learning experiences no matter what their duration or intensity.  Such
a record keeping system stimulates a myriad of alternatives to the
way in which existing class material is taught, as well as facilitating
the development of new learning experiences with new educational
objectives.  It frees faculty members from the arbitrary constraint of
the semester, enabling them to exercise their best professional judgment
in all aspects of course development.  It similarly offers students
a vastly increased number of choices, assisting them to build a
truly individualized program of study.

It has been my privilege to bear chief responsibility since its
inception for the development and administration of modular credit at
the School of Education.  Presented with the raw concept when I began
work on my degree, I developed the necessary administrative systems,
solicited modular learning experiences, and publicized the program to
students.  Within two and one half years modular credit was serving
hundreds of undergraduates and graduate students from all parts of the
campus.  The system has drawn praise from many University administrators
and inquiries from other institutions.

Late in 1970, on the basis of this success, Dean Dwight Allen
and I proposed extending modular credit to all aspects of the School's

instructional program. I developed a funding proposal for this project, known as the Flexible Curriculum (originally, the Modular Curriculum). It resulted in a two-year, $85,000 grant from the Carnegie Corporation of New York to finance a fifteen-month planning period plus the transitional costs of the first operational year. As project director, I have conceptualized the mechanisms and pedagogy necessitated by such an expansion and coordinated the work of eight staff members in implementing these ideas. I have also obtained School of Education support for the venture while working closely with Dean Allen and Associate Dean Earl Seidman in securing University approval.

I submit, therefore, the Modular Credit Program and the Flexible Curriculum as my doctoral project in the belief that it represents both a significant contribution to the field of education and a demonstration of my professional competence. By directing this undertaking I have received practical experience in structural innovation, change strategies, administration, curricular design, and academic governance, all of which complement the rest of my doctoral program -- course work and independent study -- and provide a solid foundation for a career in education.

As part of my project dissertation, I offer this written description of the Flexible Curriculum at the School of Education. It is divided into two major sections. Chapter One is general background. It includes a historical perspective on the credit system in American Education, an overview of the mechanics of modular credit, an analysis of this idea's advantages and disadvantages, a discussion of its development at the

School of Education, suggestions about the concept's curricular

implications, and proposed evaluation mechanisms. Chapter Two gives

a detailed description of how the Flexible Curriculum is organized and

administered. In essence, it is a blueprint for change. In its

entirety, the document offers a plan for a workable structural alter-

native in higher education, one that shows promise of improving the

quality of teaching and learning at this level. Hopefully, it will add

to the University of Massachusetts' growing reputation as a proving

ground for responsible innovation.

# CHAPTER ONE

## An Alternative in Perspective

Writing to James Warren in 1776, John Adams observed, "All
great changes are irksome to the human mind, especially those which
are attended with great dangers and uncertain effects." A corollary
of this assertion is that lack of change is normally a comfortable state
of being. The law of inertia applies as surely to human affairs as it
does to the physical universe. Yet if the lessons of history demonstrate
nothing else, they prove that when society capitulates to static
security, it sentences itself to decay and ultimate extinction.
Institutions which do not keep pace with humanity's relentless evolution
are inevitably consigned to the limbo of forgotten obsolescence.

There is no exception to this principle for the institution of
education. Indeed, as a chief pillar of society, it is more prey
to the dangers of inertia than many of its counterparts. H. G. Wells
once remarked, "Human history becomes more and more a race between
education and catastrophe." Unfortunately, perhaps even tragically,
education is an excellent example of a static, tradition-ridden social
institution, and catastrophe thus looms perilously close.

The problem seems to result not so much from ill will as from lack
of vision. Few leaders in recent history have asked "what should
education accomplish?", answered the question in modern terms, and used
that answer to reform schools. The end product of this complacence

is a nineteenth century system, based on a set of assumptions too long

untested and unquestioned, which is firmly entrenched in the late

twentieth century. It is not very surprising that education today

contributes more to problems than to solutions.

## The Credit System in American Education

The credit system is an excellent example of this phenomenon. Here

is a quantitative mechanism for recording educational progress which

has gradually become an end in itself, ultimately determining the

structure of learning and confining it to one basic format: the

multiple-week course. Today attempts to restructure curricula are

blocked both by the inability of credits to monitor alternate learning

arrangements and by the assumption that courses are the best, nay the

only, way to dispense knowledge. Inertia has transformed a tool into

an albatross.

The real irony of this particular situation is that credits

were originally introduced as an innovation designed to create flexiblity!

In the 1870's electives started to become a common feature of curricula,

first at the college level and, within twenty years, in high schools.

Influences producing this result included public pressure for more

variety and practicality in instructional programs, the example of

European educational institutions, and, most important, the exigencies

of a changing world.

Prior to this point, record keeping was a simple task. A student

marched unhesitatingly through a rigidly prescribed series of classes,

emerging in the end with the proper diploma or degree. As electives

introduced the element of choice into the picture, however, a quantitative measure of accomplishment became necessary. The commander of the struggle for educational flexibility was Charles Eliot, president of Harvard University from 1869 through 1909. His first victories were won on his own campus. There all students were given virtually complete freedom of curricular choice by 1884, and requirements for the A.B. were measured arithmetically: 18.4 courses yielded a degree. The battle had begun.

Soon other American universities began to follow Harvard's example. More and more, degree requirements were defined in numbers of full or half courses. Furthermore, "course" was quantified, and numbers of class hours or meetings per week were stipulated. Next high schools began to enlist in the army of innovation. These institutions multiplied after 1874, when the courts upheld the right of state governments to tax for the purpose of secondary education. They created new programs of study, and began to seek ways of monitoring them with an eye towards their college-bound graduates.

This search generated two committees during the last decade of the nineteenth century: the Committee of Ten on Secondary School Studies and the Committee on College Entrance Requirements. The former was headed by Eliot himself, who introduced a new unit of measurement: the point. This equaled a half year's work in one subject for four or five lessons per week. The point evolved into the unit, which measured a full year's labor. By 1906, the Carnegie Foundation for the Advancement of Teaching had further quantified the unit, which now

represented five hour-long meetings per week. But the truly astounding
feature of these Carnegie units was not their rigid definition. Instead
it was the explicit contention that the fundamental criterion to be
considered would be the time spent on a subject, not results attained.

By the beginning of this century, then, the credit[1] (a term which
eventually replaced points and units) was firmly ensconced in American
education at every level above primary. Starting in colleges, its
pervasive influence soon reached high schools and thereafter penetrated
the newly exalted realm of the graduate school. Its orthodoxy was
strengthened as an exact amount of preparation was added to class time
definitions (on a two-to-one basis). Students quickly learned the basic
survival skill of the system: concentrate on banking arbitrary units;
don't worry about what is actually learned. Faculty adopted the three-
credit course as an archetype and began to view one- or six-credit
experiences as suspiciously radical innovations. Administrators settled
comfortably into their role as pedagogic bookkeepers. The situation was
accurately described forty years ago by George Counts, who criticized the
fact that:

> . . . education is thought of in terms of the construction
> of buildings, the floating of bonds, the keeping of records,
> the differentiation of function, and the evolution of a form
> of pupil management which makes possible the rapid and easy
> movement of great masses of children through the schools.

---

[1]As defined in Student Personnel Terms in Higher Education
(National Center for Educational Statistics, Washington: U. S.
Government Printing Office, 1968), p. 14, "a credit is the quantitative
measure assigned to a course generally stated in semester hours or
quarter hours; the recognition awarded for the successful completion of
course work."

> And the ambitious school administrator covets a reputa-
> tion for efficiency and feels complimented if he is mistaken
> for a banker or the director of some large corporation . . .
> . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
> . . . Under these conditions there is grave danger that the
> individual child will be lost and that the machinery of
> administration will obscure the process of education itself.[2]

Laboring under the weight of such inertia, it requires a conscious

effort to refocus our vision on the raison d'être of the credit system.

It is difficult to remember that this mechanism, responding to increased

numbers of electives, was expressly designed to allow students a

higher degree of flexibility than they had ever before enjoyed. It

assisted universities in introducing new courses, in establishing

distribution requirements to provide curricular balance and variety,

and in facilitating inter-institution transfers. Furthermore, specific

definitions of the credit were not originally inviolate. The University

of London provided precedent for credit by examination, thereby focusing

on results, not time. An early format for "mini-courses" was created

in the 1870's by the University of Michigan, which allowed exercises in

differing subject areas to be combined in producing a concocted "full

course."

Yet in a manner painfully typical of education in general the credit

system lost its original responsiveness and became an end in itself.

Its critics are legion, if impotent -- and some of them raised their

cry a generation ahead of the Kozols and Holts. Thorstein Veblen, for

instance, observed in 1918:

---

[2]George S. Counts, The American Road to Culture (New York:
The John Day Company, 1930), pp. 138, 141.

The ulterior consequences that follow from such business-
like standardization and bureaucratic efficiency are
evident in the current state of the public schools, especially
as seen in the larger towns . . . The resulting abomination
of desolation is sufficiently notorious.[3]

Forty years later, the Fund for the Advancement of Education detailed

the problem:

One great difficulty with the traditional patterns of
education is that they are presented to students in fairly
rigid "units" which may be administratively convenient but
which are educationally inefficient and actually hamper
the student in making the most effective use of his time
and that of his instructors for his learning. In most
colleges and universities, we have acted on the assumption
that there is not effective learning unless a professor
offers a course "packaged" in quarter or semester units of
a given number of hours a week and the student is exposed
to direct instruction in the required number of hours. Content
must be padded or trimmed down to fit neatly into the credit
unit prescribed for a course and, generally speaking,
innovations which would disturb the complex schedule of
classes are discouraged . . .
. . . . . . . . . . . . . . . . . . . . . . . . . . . . . .
Instead of trying to find out how students can be put through
the same paces more efficiently, college staffs probably ought to
be questioning vigorously their whole course and credit structure.
No one knows the amount of wasted effort represented by
giving students experiences they don't need or ones from
which they cannot individually profit. Wiser selection at this
point may offer the greatest possibility for saving faculty
time, but few staffs seem to have the necessary courage and
stamina to do anything about it.[4]

The course-credit syndrome thus offers an excellent target for

educational reform. It is a worthwhile endeavor which has been sub-

---

[3]Thorstein Veblen, The Higher Learning in America (New York:
A. M. Kelley, 1918), pp. 225-226.

[4]The Committee on Utilization of College Teaching Resources, Better
Utilization of College Teaching Resources, A Summary Report (New York:
The Fund for the Advancement of Education, 1959), pp. 12, 56.

verted. Its original intention -- the creation of a record keeping system which would allow flexibility and stimulate change -- is still desirable. What is desperately needed now are alternative mechanisms to achieve Charles Eliot's vision by translating it into twentieth century terms.

The ideal alternative would probably be a complete escape from the credit system itself. A clean break is the one excellent way to overcome the inertia of such a well-established mechanism. Small modifications are frequently nullified by the weight of the status quo. All too often they lead to new labels for old practices. Radical change is less likely to be overwhelmed in this manner. Numerous possibilities have been suggested to implement this strategy. One which has actually been used is the comprehensive examination. Here accomplishment is monitored through one or more tests administered at wide-spread intervals in a student's program of study. Success is achieved not by accumulating class hours, but by demonstrating knowledge and understanding in general discipline areas. To some extent, a student can choose for himself which tools he will use in preparing for the examination: courses, independent study, or practicum.

Another option is the portfolio system. This is an anecdotal mechanism. A file is created for each degree candidate from his own, his professors', and his peers' input. This file, or portfolio, thus offers an accurate, complete description of a total educational experience. Like the comprehensive examination, it does not limit a learner to formal classes, but also responds to independent and practical

work. In fact these two mechanisms can be profitably combined. The one monitors preparation, the other certifies termination. The University of Massachusetts' School of Education already uses this combination as a component of its doctoral program, which is less affected by rigid university credit requirements than undergraduate and master's degrees.

An entirely different alternative is competency-based education. It is a reaction to the topsy-turvy assertion of the Carnegie unit that time, not results, is important. In this type of curriculum, measurable levels of competence are specified. A student receives a degree when he or she meets such performance criteria. It is not hours of preparation, but results which count.

Perhaps the most radical alternative to the tyranny of credits would be to redefine the meaning of a degree itself. There are scores of possibilities raised by such a venture. One, advocated by Dwight Allen,[5] would focus education on three areas: professional competence, personal enrichment, and social service. Of these three strands, only the first requires objective measurement. To certify that a student is a legitimate teacher, doctor, or carpenter, a school can use one of the monitoring alternatives already discussed and relate it to a normative standard. The latter two strands, on the other hand, need no such rigorous quantification. In other words, as education is reshaped to meet the needs of modern society, it may no longer be necessary to make a fetish of arithmetic certification.

---

[5]Dwight W. Allen and Philip R. Christensen, "Using Space, Time, and People More Effectively," in Controversy in Education (Philadelphia: W. B. Saunders Company, in press).

All of these record keeping options have the advantage of attaining Eliot's basic goal through complete escape from the orthodoxy which his followers helped create. This can also, however, be a disadvantage. The reality of social inertia means that such radical changes are often stillborn because professionals will not tolerate the associated risks. This phenomenon may require an intermediate step in reforming the structure of post-primary education. In her own analysis of the problem, Lanora Lewis describes the advantages of this transitional approach:

> In our system of autonomy among institutions of higher education, changes come about slowly, often more as a result of social pressures than as a result of deliberate planning in anticipation of society's needs. The basic question is whether the class-hour credit system, despite its practical values, hampers progressive developments in curriculum and instruction. In the meantime, some may consider current modifications of the traditional credit system as little more than mere tinkering. Transitional modifications, however, may become highly stabilizing elements in the cooperative endeavors of institutions during the period of search for, and transition to, an improved measure of accomplishment, a measure which is interchangeable among the many institutions of higher education and meaningful to those who must estimate the student's ability from his college record.[6]

Lewis details credit by examination as a practical example of such an alternative. The School of Education has had three years' experience with another possibility. It is known as modular credit. Before turning to a detailed discussion of this innovation, however, a final word is necessary to place it in perspective. If it can be assumed on the basis of the preceding discussion that the credit system

---

[6]Lanora A. Lewis, The Credit System in Colleges and Universities, New Dimensions in Higher Education, No. 9 ( Washington:  U. S.  Government Printing Office, 1961), p. 2.

has gone too long unchallenged, and that alternative approaches to monitoring learning are now required, it should not be assumed that there exists one best alternative.

Twentieth century America is a pluralistic society. What is good for one group of people is not necessarily good for all others. To seek a single ideal learning format for every student, every institution, every professor, every community, is dangerous. Furthermore, there is no data on which to base a decision among alternatives. We have a history of doing things in only one way, and we lack the information to make predictions about the potential success of other approaches. If education is truly a science, then it must depend on experimentation. Experimentation, in turn, is predicated on the right to fail. The only way to judge a hypothesis is by testing it. Modular credit is offered as one alternative ready for such a test. No claim is made that it is better than, or worse than, competency-based or credit-by-examination systems. It is simply a viable possibility, and, as such, worthy of close scrutiny.

## Modular Credit:  The Concept and Its Development

In essence, modular credit is a synonym for mini-credit.  Much
of the rigidity in the credit system derives not from its quantified
nature, but from the size of the basic component.  As we have already
seen, points, units, and credits all have a common referent:  the
course.  Either a half year or a full year, approximately fifteen or
thirty weeks, it was the course which Eliot and his successors
chose to measure.  Even with the growth of electives, few educators
thought to question whether such relatively huge learning experiences
were in reality divinely ordained as the optimal educational format.
Inertia dictated that the course be the norm.

Since credits were never designed for the weekend seminar or the
open-ended practicum, it is hardly surprising that these types of
alternative instructional modes are not used extensively today.
Unless a professor proposes something which is organized in multiples
of fifteen weeks, he is told that it can't be processed.  A four-hour
intensive training session simply is not worth a whole credit.  The
choice is between one credit and no credits, so the experience goes
unrecognized, whatever intrinsic value it may have.

A simple but accurate analogy is the building of a stone wall.
In constructing a curricular "wall," we are currently limited to one
type of structural material:  the boulder (i.e., a credit-linked,
multiple-week course).  Any New Englander, however, can tell you
that a wall built only of boulders is an unstable edifice.  It is

infinitely preferable to use rocks of varying sizes, from pebbles on up. The large stones provide the foundation and basic outline. The smaller rocks fill in the gaps and finalize the shape. A wall constructed in such a manner is both sturdy and aesthetically pleasing.

Thus we need to find instructional formats of different sizes to complement regular courses, offerings which are both smaller than and larger than the norm. Since it is the size of the credit unit itself which has historically prevented this from happening, the unit must be shrunk. This is the genesis of modular credit. Divide a regular credit into a number of mini-credits, or modules of credit, and you can monitor any type of learning experience no matter what its size or shape. Furthermore, since modules of credit are arithmetically related to the basic credit unit, they can be translated into terms understandable by administrators. Modular credit gives the administrative freedom we desperately need for pedagogic and curricular experimentation.

This is a transitional innovation. It is a modification, not a replacement, and as such retains many basic features of the credit unit system. Modular credit is quantified, arithmetic, essentially time-linked, easily processed, and relatively comfortable for those most familiar with traditional mechanisms. It is by no means either ideal or terminal, but rather a first step towards the far-reaching changes already suggested.

The modular approach to measuring accomplishment offers two major advantages. First, it is highly flexible. Modular credit can be used to record learning experiences of varying duration, intensity,

organization, and locale. Unlike the traditional credit system, it does not dictate curricular structures, but rather facilitates change. Second, it is expedient. Modularization can claim all of the advantages of the transitional modifications suggested by Lewis. Whereas it is unlikely that many universities are now willing to drop credits altogether in favor of immediate change to, for instance, a portfolio system, it is quite reasonable to expect the same institutions to test modular credit.[7]

In some ways, then, this particular alternative involves planned obsolescence. If it is successful, it will become a foundation for more radical change based on the administrative and pedagogic knowledge gained through its use in actual practice. It is important to stress that we are dealing here not with an end, but a means. The goal is not to resolve all of the problems involved in creating new measures of accomplishment, but to start solving some of them in a practical manner.

The School of Education is now planning to revise its administrative procedures, creating a completely modular monitoring system. This innovation is known as the Flexible Curriculum. The decision to implement it was based not only on the rationale already given, but also on the success of our experimentation with modular credit as a limited auxiliary mechanism.

---

[7]To date, the School of Education has received approximately one hundred inquiries from individuals and institutions about its use of modular credit. Several of these have led to detailed correspondence about the specifics of the innovation. This initial response seems to indicate that the concept will, indeed, influence the operation of other universities.

Such a program was first suggested during the planning year at the School (1968-1969). Its exact genesis is unclear: several people seem to have contributed to the idea. In any case, by 1969 the concept was well enough developed to be presented to the University. On May 11 of that year, a meeting was held between the Faculty Senate's Committee on Academic Matters, Provost Tippo (representing the University administration), and the School of Education administration. At this time, the entire Education program was discussed, including the modular credit proposal. Permission was granted to implement the concept, with the following understanding:

a. That work taken on a partial credit basis would be Pass-No Record only;

b. Work taken on this basis might be arranged either before or after the fact;

c. Work covered would include short courses, student teaching, observation, internships, field work, and independent study, all of which then fell within the School and none of which required approval;

d. Students would sign up for partial credit experiences under existing course numbers and credits for those courses would be recorded only in full credit hours, the partial credit subtotals being recorded only in the School.

Dr. Tippo's support was critical in securing this agreement. Fortunately for the program, he saw through the risks of experimentation to the potential benefits of new learning formats.

With the promise of University approval, permission was next sought from the School itself. At this time, a proposed constitution[8] had yet to be ratified, so the essential decision-making body was the Education Assembly (where every faculty member and doctoral student had an equal vote). At a meeting on September 18, 1969, a fairly detailed motion suggesting a limited modular credit program was presented to the Education Assembly. It was passed as a recommendation to the Associate Dean for Academic Affairs, Dr. Earl Seidman.

In implementing this decision, Dean Seidman first appointed me as a Graduate Assistant in charge of administering the Modular Credit Program. After consultation with me, he also appointed one undergraduate, one graduate student, and two faculty members to the Modular Arbitration Committee (the two of us serving as ex officio members). This Committee immediately began to set policies for the program and to decide on individual modular learning experiences. Under the direction of the Committee and of Dean Seidman, I also developed a set of administrative procedures designed to operate effectively within existing University frameworks. Under this system, a section of an experimental course (Education 385/685, Practicum in Education) was assigned the label "Modular Credit." Fifteen modules of credit were arbitrarily chosen to equal one university credit.

---

[8]The School of Education Constitution was ratified during the 1969-70 academic year. It creates an administrative structure centering around a School Council composed of elected representatives of the administration, faculty, graduate students, undergraduates, and non-professional staff. This body shares with the Dean responsibility for setting School policy. A Graduate Assembly is also elected to advise the School Council on matters pertaining to graduate programs.

A series of modular learning experiences in atypical scheduling formats
was created, and students began to use the innovation. At the end of
each semester records of modular credit were totaled and reported to
the University as Pass for the equivalent number of credits of 385/685.
Remaining mods under fifteen were kept on record and could be counted
at a later date.

In the beginning, the undertaking faltered both because of
student and faculty ignorance of its existence and because of administra-
tive difficulties involved in interfacing with the University central
administration. As these problems were solved, however, the Modular
Credit Program quickly increased in both scope and quality. In the
Fall of 1971, permission was granted by the Graduate School to extend
modular credit to graduate students. At the end of that semester,
the program was offering the equivalent of 2000 credits per year to a
wide variety of learners.

The success of the limited Modular Credit Program led to a
proposal for the Flexible Curriculum, which, as has already been noted,
is an extension of modularization to the School as a whole.

Late in 1970 I thus prepared a preliminary funding proposal for
the Flexible Curriculum, which represented the next logical step in
experimenting with modular credit. This was submitted to the
Carnegie Corporation of New York, which responded positively. They
requested a more detailed explanation, which was submitted on
February 26, 1971. This document was eventually accepted by the Founda-
tion. It resulted in a $53,000 grant for a planning year, plus a

guaranteed $32,000 to cover implementation and transition costs during the first year of operation.

While funding was being sought, the proposal moved through the School of Education approval mechanisms. On January 27, 1971, the Executive Committee of the School Council approved the preliminary proposal and sent it to the Academic Matters Committe for another recommendation. The Academic Matters Committee, in turn, scheduled a month of hearings and open meetings on the Flexible Curriculum. At the end of this time, it produced a basically favorable recommendation to the School Council, and sent the package to that body.

On February 25, therefore, the School Council took under consideration the proposal to implement the Flexible Curriculum. It had before it a positive recommendation from the Executive Committee and a qualified recommendation from the Academic Matters Committee. Essentially, the latter suggested that the School approve the basic concept immediately, but delay six months in authorizing the implementation, until it could be seen whether or not adequate administrative procedures had been developed. After much discussion from members representing all segments of the School, the Council tentatively approved the project for September of 1972 if adequate plans were developed before then. On the same day, the Graduate Assembly met to consider the Flexible Curriculum. It eventually supported the Council's action. Thus the School gave its authorization to begin planning the project, and promised to make a final decision in one year.

When the Carnegie funds arrived on July 1, 1971, a planning staff was set up under my direction. This group immediately began work developing the procedures requested by the School Council and Graduate Assembly. Input on potential problems and solutions was solicited from a number of people. In November of 1971, an interim report was published to document progress to that date. This report was circulated within the School and, to a small extent, the University. After its distribution, a series of formal meetings was scheduled to allow all parts of the School of Education community to react to the plans and suggest appropriate changes. On the basis of this feedback, further planning steps were taken, culminating in a final report to the community published in February of 1972.

This document then went through the same approval steps that the original proposal had undergone. Again, the costs and benefits of the innovation were widely discussed. Finally, on March 2, 1972, both the School Council and the Graduate Assembly approved a motion to implement the Flexible Curriculum in September.

The next step was to obtain University approval for the project. The School of Education argued that the Flexible Curriculum essentially represents an administrative change. It does not require that any new material be taught without regular academic approval, but only allows the already approved curriculum (including experimental courses) to be offered in new formats. Furthermore, since modular credit can be translated into regular credit equivalents and reported

under a cover course number (as documented in Chapter Two), no major
procedural changes were necessary for the Central Administration.

By the end of March, Dean Allen had obtained verbal confirmation
of this analysis and permission to proceed from Dr. Mortimer Appley,
Dean of the Graduate School.  At the same time, Dean Seidman and myself
were visiting the Academic Matters Committee of the Faculty Senate,
which agreed on April 6th that Senate approval would not be necessary,
either.  Finally, David Bischoff, Special Assistant to the Provost,
gave permission to the School.  Although formal implementation was
scheduled for September 1972, preregistration for the Fall was carried
out during the week of May 1st using the new administrative mechanisms.

It would appear, however, that the agreement originally negotiated
between Deans Allen and Appley was too vague, for the latter reacted
negatively to the modular preregistration.  On May 18th, he sent a
memorandum to Dean Allen demanding that all references to the Flexible
Curriuclum be deleted from the Graduate Bulletin.  Dr. Appley then
pressed his case with Dr. Bischoff, who expressed new reservations
about the project.  The result was a revised one-year approval for the
Flexible Curriculum which included some modifications in the reporting
and bookkeeping components of the system.  These are explained in
Chapter Two.

It must be noted that the problems which led to these revisions
seem more political than pedagogic.  The two stumbling blocks were
monitoring and course approval.  Dean Appley, however, never examined

the specific record keeping procedures developed to meet these concerns which the School of Education believed to be more than adequate. The compromise developed by Dr. Bischoff, although workable, complicates the administration of the Flexible Curriculum without improving its responsiveness, accuracy, usefulness, or efficiency. Nevertheless, the basic idea remained intact, and implementation of the new system continued on schedule.

## The Flexible Curriculum: An Overview

The Flexible Curriculum is an extension of modular credit to the entire instructional program of the School of Education. Under it, all learning experiences are assigned a credit value in modules of credit (or mods), using the formula one hundred mods equal one credit.[9] The specific administrative systems stemming from this procedure will be described later. Before examining them, however, it is appropriate to focus on the advantages and disadvantages of this structural innovation.

The Flexible Curriculum's most direct benefit is that it allows atypically scheduled learning experiences. No longer must a course be forced into a specific number of meetings over a rigidly defined number

---

[9]The original equivalency formula, fifteen to one, was changed for two reasons. First, the modular unit was still not small enough. In order to maintain equity with traditional credits, it became necessary to use half-mods, an awkward compromise. Second, many people found it difficult to calculate in multiples of fifteen. The one hundred to one formula provides units which are small enough to respond to the shortest learning experiences. Furthermore, its decimal nature makes it easy to translate mods into credits.

of weeks because of the way in which credit is determined.  Instead,
faculty members can examine their own instructional objectives plus
the needs of their students and then choose the most suitable time
format.  In some cases, the choice will be a traditional semester-long
course.  The Flexible Curriculum does not eliminate options; it
augments them.  In other cases, the choice might be a one-meeting
lecture, or a two-week intensive seminar, or a twenty-week workshop.

Although the specific possibilities are infinite, one can
briefly categorize the basic structures which the innovation uses.
The first option is the single-session experience.   This type of
instruction has been used to great advantage in organizing the School
of Education Marathons which during one week each semester offer
hundreds of brief, introductory classes ranging over the entire field
of education.  A similar alternative is the short-term offering.
Usually lasting from two to four sessions, this allows a chance for
follow-up and between-class individual preparation.

Next is the multiple-week course.  This kind of learning
experience follows the traditional pattern of a few class meetings per
week.  It may use the standard semester model -- thirteen to fifteen
weeks total length -- but only if this is the optimal duration.  Six
or sixteen weeks are equally feasible, depending on what is needed by
the instructor and the students.  At the other end of the spectrum
from single-session experiences is the long-range course:  a learning
experience lasting more than a year.

Finally, the Flexible Curriculum permits open-ended seminars. Students are often more interested in a specific instructor than in specific content, especially at the university level. Modularization allows learners to work with a particular teacher as long as they wish, dropping out when their needs have been met, and receiving credit for the time they have spent in the class. The seminar continues indefinitely as long as there is a "critical mass" of enrolled students.

All of the above involve durational flexibility. The second dimension which can be varied within the Flexible Curriculum is intensity. What would normally take ten weeks can be compressed into ten days by increasing the number of meetings per week. By the same token, a three-week seminar can be expanded to nine weeks if class is held once every seven days instead of Monday, Wednesday, and Friday. Individual class length can also be varied to achieve flexible intensity.

The third dimension which is open to change is the internal structure of learning experiences. An instructor can provide multiple entry and exit points so that individual students can choose which sections of courses lasting more than a few meetings they wish to take. This organization can be fixed by the professor, who presets entry and exit points, or can be individually negotiated by each learner. There can be a single entry point for all but alternative exit points, or several starting times but one end time, or a multiplicity of both entry and exit points. Whatever the specifics, this structural option allows one basic course to be different things to different people. Another

kind of internal organization is the <u>intermittent experience</u>, where class meetings are held some weeks but not others and intensity can vary throughout the offering. For example, a multiple-week course could meet once a week for five weeks, break for another five, and conclude with two weeks of daily sessions.

Obviously variations on these three dimensions can be combined to create still more alternatives. A long-range seminar (two years) could operate at reduced intensity (one three-hour meeting every other week) with five pre-set entry-exit points. Or an open-ended learning experience could meet five days a week for two weeks, once a week for three more, and by arrangement from then on. It is such combinations that give this innovation nearly infinite possibilities.

One final alternative remains. It has already been noted that the Flexible Curriculum is a transitional change. It is still time linked, since modules of credit are derived from regular credits, and 300 mods involve the same amount of class plus preparation time as three credits. Yet there is no reason why experimental use cannot be made of alternative ways of determining credit. As usual, several possibilities exist.

One is competency-based education. If an instructor chooses to define the end of his learning experience in terms of performance criteria (rather than number of meetings, length of papers, or the like), credit would be assigned according to the time needed for an average student to successfully meet those criteria. Any learner

testing out of the experience would then receive this amount of credit, no matter how much time he or she spent in actual preparation.

Another option is retroactive credit. Recent years have seen a gradual change in the role of a university. Institutions of higher education no longer limit themselves to disseminating facts; they also certify knowledge, skills, and experience relevant to a specific degree but obtained outside their walls. For example, the University of Massachusetts gives academic credit to students who participate in off-campus learning experiences with only minimum on-campus supervision through programs such as University Without Walls and The Year for Action. A similar concept could easily be incorporated into the Flexible Curriculum. A student who has participated in what he feels to have been a relevant learning experience would present some sort of description and documentation to a standing committee of instructors or any individual faculty member (whichever mechanism is most workable). The request would be judged acceptable or not acceptable and assigned credit on the basis of a standardized set of guidelines similar to those used for regular course approval. In this way the boundaries of a university can continue to expand.

Still a third alternative is field experience. The Flexible Curriculum makes it easier than ever before to allow students to learn by doing. For instance, a two-week classroom observation experience could not be recorded under traditional monitoring systems, since it does not last an entire semester and is worth less than a full credit. Modular

credit, on the other hand, makes it possible to include such a valuable practicum on a student's record.

Thus the Flexible Curriculum offers a vast number of structural options to instructors who are planning learning experiences. They are free to teach exactly what they wish to teach, without adding irrelevant material or dropping important lessons for the sake of the semester norm. They can focus their classes more accurately on specific areas of their own professional interest and competence. And they can adjust the duration of the offering on the basis of student interests or needs (using, for example, the open-ended and multiple entry-exit point options).

A second advantage for faculty is the freedom to adjust their teaching schedules for maximum professional growth. Since a professor is no longer constrained by the fifteen-week mold, he or she could compress a semester's instructional load into, for instance, twelve weeks. This would leave three weeks free to attend conferences, do research, write articles, plan new curricula, etc.

The advantages of the Flexible Curriculum for students all derive from the variety of alternative educational structures legitimized through modular credit. Essentially, learners are given a vastly increased number of choices in building individualized programs of study -- choices derived from both a modularized, institutionally-generated curriculum and a strong independent study component. This flexibility, in turn, provides the opportunity to meet individual needs

exactly and freedom from being forced to learn irrelevant material
because of the confines of rigid courses. It makes it easier to focus
on specific topics and problems which relate directly to one person's
own learning agenda.

For example, suppose a graduate student must learn how to calculate
statistical tests of significance in order to complete a small research
study. Traditionally she would have to take an entire course and
master everything from regression analysis to non-parametric statistics,
even though such content was mostly irrelevant to her needs. Under
the Flexible Curriculum, on the other hand, she could enter a statistics
course when t-tests were introduced and leave after studying analysis
of variance. She would learn exactly what she needed -- no more, no
less. Future professional researchers, on the other hand, could enroll
in and benefit from the entire course.

Under such a system, students can alter their programs at any
point during the semester. Arbitrary deadlines for adding or dropping
courses no longer need apply. There is also the opportunity to vary
work load, and to begin or end studies at any time. In the same manner
as a faculty member, a student could compress a semester's work into
twelve weeks and use the remaining time for individual projects such
as off-campus experiences. In essence, then, this innovation treats
university students as mature individuals and gives them as much (or
as little) freedom as they can profitably use.

Not only does the Flexible Curriculum promise significant advantages for faculty and students, it can also help the community and the university itself. At the community level, the system allows better use of resources. A school principal whose own job prevents her from committing fifteen weeks could easily teach a three-week evening seminar on practical administrative techniques. By the same token, she could also benefit from inservice training on such a modularized basis without compromising her own professional commitments. The goal of social service as an integral part of the college curriculum could be achieved using the schedule flexibility already discussed. Students, could, for instance, spend several days working in community centers assisting a local educational system while enriching their own studies in on-the-job training.

In an era of tight budgets, the Flexible Curriculum offers institutions more efficient use of their own resources. We have already seen how it frees faculty and students from wasting time on irrelevant material. Atypical programming also means better use of time and space. Evenings and weekends can become a normal part of the academic year, and classroom space which would otherwise go unused can be employed at these times to help enrich the curriculum. Trimming the pedagogic fat from existing courses also frees faculty time and instructional space for more relevant learning. Perhaps most important, however, is the fact that the Flexible Curriculum is a viable means of overcoming educational inertia. It is a significant improvement over the traditional credit system, offering increased flexibility and a practical first step towards truly modern mechanisms for measuring accomplishment.

It is important not to confuse this innovation with mini-courses, a type of minor modification to Eliot's credit system which is now gaining popularity in the United States. Whatever their advantages, mini-courses have the unfortunate side effect of substituting one orthodoxy for another. No one can argue that four weeks is any more appropriate for teaching every subject than is fifteen weeks. The Flexible Curriculum does not dictate any one scheduling format. Instead, it allows faculty and students to choose -- fifteen weeks, four weeks, or something entirely different. It is this element of choice that makes it unique, more expedient than a total elimination of the credit system, but far more flexible than either the semester or the mini-course alternatives.

There are also, of course, potential disadvantages to the Flexible Curriculum. One of these is its transitional nature. The positive aspects of such an intermediate step have already been noted. A negative feature, on the other hand, is that it may not go far enough. Reformers always face the danger that when sacrificing ideals for expediency, they may compromise themselves out of worthwhile change. Unless the Flexible Curriculum is perceived as a major modification with significant, unique results, no fiery improvements will be discovered in its smoke.

If the full potential of the system is used, this should not be a problem. A curriculum where three-credit courses are only one option in a myriad of instructional formats cannot fail to generate excitement.

On the other hand, something which is labeled flexible, but is in reality traditional courses masquerading as 300-mod offerings, is worthless. Thus the innovation has the potential to stimulate viable alternatives, but the danger of being itself slowed and stopped by inertia.

A second disadvantage to the modular concept is a specific derivative of the first. One of the major criticisms raised against Eliot's credit system is that it measures time, not learning, and thus turns students into accountants instead of scholars. The feature that makes the Flexible Curriculum moderate instead of radical is its time-linked nature. Not only does it fail to correct this fault in the status quo, it actually exacerbates it. Whereas before students scrambled for their ration of fifteen credits each semester, they now will have to scrounge for fifteen hundred mods. This problem can, of course, be mitigated by focusing student attention on the curriculum itself and advertising modular credit as merely a record keeping mechanism. Even so, the system will undoubtedly reinforce incorrect perceptions of education in some individuals. The advantages of this alternative will hopefully outweigh this problem in the short run. And in the long run, modular credit should be successful enough to eliminate itself and spawn a performance-linked successor.

Not only does such administrative miniaturization risk reinforcing undesirable mind-sets in students, it also raises new questions about academic standards. There is a danger of fragmentation. Both instructors and learners might be tempted to break all education into

very small, unrelated pieces with no opportunity for consolidation.
Fortunately, the initial modular preregistration did not reflect
such particularization. Even if the curriculum itself isn't frag-
mented, however, there is the related challenge of integration. Under
the Flexible Curriculum, the School will have to be more concerned
than ever before with helping students organize their individual
programs of study in a rational, academically justifiable manner.

Fourth, there is the disadvantage of increased complexity. Again,
students are potentially the chief victims. The Flexible Curriculum
represents new administrative procedures for the School of Education's
clients. These changes are designed to produce the benefits previously
noted, and can be defended with a cost-benefit rationale. Their impact
on students (as well as faculty and administrators) must, however,
be minimized through careful planning and understandable regulations
if the benefits are truly to outweigh the costs.

Another problem is the penalty of added drain on resources. The
funds for planning and the initial debugging of the Flexible
Curriculum were supplied by an outside agency. Ongoing operation will,
however, require both the use of the University's administrative
computer and the services of additional staff members. As the system
is refined, this should represent a diminishing dollar cost. None-
theless, some additional funds are required to realize the advantages
of this particular innovation.

Finally, there is a problem common to all change: uncertainty. We have done our best to plan the Flexible Curriculum so as to minimize the pain of transition. But the difficulties which we have anticipated are undoubtably only the tip of an iceberg. When a horse raced a steam engine for the first time, the horse won! Any innovation brings unexpected problems which can only be solved in practice. This one should be no different.

When all of these disadvantages are measured against the anticipated benefits of the Flexible Curriculum, the scale seems to tip to the plus side. Indeed, they seem a small price to pay for an alternative which promises significant improvement in the quality of higher education. Nonetheless, it is important not to overlook these potential penalties, especially since many of them can be minimized through careful, adequate planning.

## Pedagogic Implications of the Flexible Curriculum

One of the advantages of tradition is that it provides automatic answers to many questions. We are saved the bother of making several decisions each day about how to greet people by the tradition of a hand-shake and the phrase "nice to see you." Such a phenomenon makes our lives relatively comfortable and predictable. The danger is, of course, that this very advantage will seduce us away from change when it is needed. Traditions should be frequently reexamined in the light of a dynamic society. When they become obsolete, alterations must be made. Long unasked questions need to be resurrected and new answers found.

The Flexible Curriculum is designed to break the tradition of uniform learning experiences. In so doing it raises questions about the structure of education which have heretofore been rhetorical. The basic one is "how long does a learning experience last?". The traditional response, "one semester," becomes but a single possibility in a spectrum ranging from "one hour" to "four years" to "as long as necessary." Other queries soon follow. Are certain durational formats most appropriate for certain educational objectives? Can learning experiences be optimally sequenced, and, if so, whose responsibility is it to do so? Who insures that new knowledge can be integrated into a student's existing cognitive structure, or is such concern even necessary? How should entry and exit points in a long term course be determined?

Each of these questions and scores of similar ones have to date either admitted only one answer or been completely ignored. At no time has there been a conscious selection between alternative learning formats. If we require the same support for a modular system as for a traditional one, we can avoid the whole issue. There is no proof that a semester-based structure is optimally scheduled, sequenced, and integrated. Any use of a modular curriculum, therefore, probably would be as good as the status quo. But a university should strive to be excellent, not simply adequate. If it is within the power of educational philosophy and research to discover the best approaches, they should be adopted -- even if this step is not required to defend the change. If the best cannot be determined a priori, a wide variety of alternatives

can be implemented and tested to uncover the most appropriate answer

(or, more likely, answers).  Such a strategy is not a rationale for

attempting an innovation, but a means of insuring that the innovation will

yield maximum benefits for all concerned.

All of the basic pedagogic questions raised by modularization center

on the optimal conditions for learning.  The obvious place to look for

answers is learning theory.  This particular branch of psychology is

replete with different postulates and models.  There is no consensus among

researchers about even the definition of learning.  Suggestions range

from the modification of behavior (some sort of manifest change which can

be observed and measured) to the modification of cognitive structures

(an inferred change, such as the perception of new relationships) to

physiological modification.  No one definition or model is universally

accepted, nor does any one approach explain all learning.  Robert Gagné,

however, provides a good starting point.  His hierarchy of eight pro-

gressively more complex types of learning includes components of many

of the most prominent theories.

Gagné starts with <u>signal learning</u>, the simplest form.  This is typified

by classical conditioning (such as Pavlov's salivating dogs), where a

bond between a stimulus and an involuntary response is reinforced.  Next

is <u>stimulus-response learning</u>, involving a similar bond between a stimulus

and a voluntary response (operant conditioning).  <u>Chaining</u> occurs when

several such bonds are connected in a specific sequence.  <u>Verbal</u>

<u>association</u> is a more complex form of chaining, using language.  <u>Multiple</u>

<u>discrimination</u> occurs when a person learns to respond differently to

similar verbal associations.  <u>Concept learning</u> requires a response to things or events as a class, and demands that the student abstract properties and combine them as a group.  <u>Principle learning</u> essentially is the chaining of concepts.  Finally, and most complex, is <u>problem solving</u>.  This requires a pupil to integrate principles and use them in a new situation.

Gagné applies his model to education in two ways.  First, he specifies certain conditions which are necessary for each type of learning.  For example, the several requirements for verbal association (type four) include presentation of the verbal units in proper sequence and provision for the confirmation of correct responses.  Second, he states that for any given terminal behavior, learning must progress from the lowest to the highest level.  Any instructional sequence which attempts to skip a level is doomed to failure.  The best it can produce is meaningless, rote learning.  Thus Gagné can outline a "learning structure" for teaching the ordering of numbers.  At the bottom is stimulus-response learning (naming), in the middle are concepts (like different, set, etc.), and at the top are principles (forming sets).  A student would have to progress step by step through the sequence before being able to solve a problem involving the ordering of numbers.

Two of the most influential models of learning in the literature focus on different parts of Gagné's hierarchy.  The first is the associationalist tradition.  It emphasizes the stimulus-response level. Learning is defined in terms of the relationship between a sense perception and a particular behavior.  It is facilitated through reinforcement, any event which strengthens a response.  A great deal of

research has sought the most powerful reinforcers. It demonstrates that continual reinforcement is more vulnerable to extinction than a variable reinforcement schedule, and that punishment induces faster learning coupled with faster forgetting than does reward.

The best known application of associationalist psychology to the classroom is programmed learning, advocated by B. F. Skinner. Its goal is to reduce the learning of any given terminal behavior to a maximum number of small steps, thus offering much reinforcement to the student while minimizing the negative implications of failure. As the program progresses, the degree of prompt is vanished (i.e., the number of cues is reduced). The individual steps may be arranged in a linear sequence, in which the programmer tries to insure that every response will be correct, or in a branching program, where alternative sets of questions are supplied when a wrong answer is given so that the student is assisted in mastering a difficult point.

This approach to learning can also be used to guide the instructor's behavior. The teacher can strive to provide as much positive reinforcement to students as possible. For example, a quiz can be graded immediately (perhaps by the pupils themselves) instead of being handed back a week later. A corollary to this is behavior modification, where a troublesome student is socialized by withholding reinforcement for undesirable behavior and providing strong reinforcement for desirable actions.

The second major model (or, more accurately, class of models) might be described as insight theories. Associationalism began with Pavlov's

dogs and their food (classical conditioning) and Thorndike's cats in boxes (operant conditioning), generating the premise that learning involves the strengthening of the bond between a given stimulus and a given response. Insight models, which are in the Gestalt tradition, date back to the experiments of Wolfgang Kohler. This researcher observed monkeys trying to get out-of-reach bananas, and noted that occasionally, after much futile trial and error, an animal would join together two sticks or pile up two boxes to reach the food, as if he were faultlessly carrying out some plan. This is an example of insight, the perception of new relationships involving internal representation and reorganization.

Kurt Lewin continued this tradition, developing the concept of "life space." Essentially, he believed that in order to understand behavior one must view people not as they appear to others, but as they perceive themselves. Today this approach is represented by the cognitive field theorists, who define learning as the rearrangement of thought patterns.

If Skinner speaks for stimulus-response in the classroom, one must turn to Jerome Bruner as the spokesman for cognitive field theory. Its major direct application to education is discovery learning, based on the belief that when a student uses his knowledge of principles to solve a problem for the first time, he learns a more complex principle. This technique emphasizes structure in teaching as a tool for facilitating intuitive thinking. One might say that the focus is on the upper part of Gagné's hierarchy. (Of course Bruner recognizes the need to deal with "fundamentals." Skinner, on the other hand, argues for a stimulus-response approach to the learning of principles.) Bruner describes

discovery learning in <u>Toward a Theory of Instruction</u>:

> To instruct someone in [a] discipline is not a matter of
> getting him to commit results to mind. Rather, it is to
> teach him to participate in the process that makes possible
> the establishment of knowledge. We teach a subject not to
> produce little living libraries on the subject, but rather
> to get a student to think mathematically for himself, to
> consider matters as an historian does, to take part in the
> process of knowledge-getting. Knowing is a process, not
> a product.[10]

These are not, of course, the only models of learning. H. F. Harlow
speaks of learning sets, which involve the transfer of previously
assimilated experience to a new situation (monkeys who learn to distin-
guish oddity and to apply the concept to novel problems). Albert Bandura
proposes a modeling theory, where direct learning is a result of obser-
ving other people's behavior. The ubiquitous computer has inspired
information processing models, which postulate a programmable central
nervous system operating on inputs and producing output. However, the
goal of this discussion is perspective, not depth, so they shall not be
explored in detail. For the most part, their direct influence on
classroom practices has not been great.

---

[10]Jerome S. Bruner, <u>Toward a Theory of Instruction</u> (Cambridge:
Harvard University Press, 1966), p. 72.

What is the potential inherent in these models of learning to assist in answering the questions raised by modularization?  Even a superficial overview of the field quickly uncovers the disappointing fact that there are no definitive solutions.  Part of the problem is the relative newness of this branch of psychology in general, when compared to the natural sciences.  There simply has not been time for one model or approach to prove beyond question its worth.  And given the complexity of the human organism, it would be foolish to anticipate such an outcome in the near future.  At best we can assume that learning is not a single thing, but a constellation of behaviors, and hope that different theories will explain different aspects of the phenomenon.

Yet it is still surprising (at least to the uninitiated) that so few concrete results have emerged from the collection of models surveyed here.  Many of them are entirely divorced from the classroom.  Others have suggested classroom applications which are still ignored by most teachers (for example, Gagné's learning structures).  Only two methods, programmed learning and discovery learning, have found wide-spread acceptance -- and they also count numerous critics.

This sterility stems from many difficulties.  The emphasis of most research has been on exploring why learning takes place, not on how to make it happen.  This has led some educators to argue that we need theories of teaching, not theories of learning.  The research that does exist frequently concentrates on young children, not on the university student who is the basic client of our School of Education.  There is also a perennial problem in applying laboratory research to real life situations.

In The Psychology of Learning Applied to Teaching, B. R. Bugelski isolates several characteristics of the laboratory setting which differ from the classroom. The subjects are usually small animals or college sophomores -- a highly selective sample, to say the least. Laboratory exercises are often useless to the subjects and designed to minimize past experience. Learning is precisely controlled by the experimenter and measured by a subject's ability to barely perform an assigned task. Finally, no attempt is made to become acquainted with subjects as individuals.

Psychologists themselves recognize this gap between theory and practice. J. M. Stephens based his theory of spontaneous schooling on a review of teaching studies which showed that about the same amount of learning takes place regardless of the instructional method used! James Kuethe, author of another overview of the teaching-learning process, states categorically that a choice of teaching methods should never be based on learning theory. He says:

> Basically, it seems that the fact that there are various
> theories of learning does not imply that dramatically
> different classroom procedures should be used. One set of
> theories may call for adequate reinforcement, but other
> theories would endorse the same procedure on the basis of
> a different formulation.[11]

But perhaps the clearest indictment was voiced by Donald Snygg, a central figure in the perceptual approach to learning:

---

[11]James L. Kuethe, The Teaching Learning Process (Atlanta: Scott, Foresman and Company, 1968), p. 37.

> The sad truth is that, after fifty years of careful and
> honest and occasionally brilliant research on the nature of
> learning, the only people who can be proved to have received
> any practical benefits from learning theory are the learning
> theorists themselves.[12]

We cannot, therefore, expect cookbook recipes for using the
instructional options of a completely modular format.  No one will be
able to demand, "If you wish to teach an in-depth course on Dewey's
philosophy, meet twice a week, two hours per meeting, for ten weeks,
begin with an overview of educational philosophy, and limit the enrollment
to third-year students who have previously studied the philosophy of
education."  Instead, we must continue to rely on the same decision-
making strategy which we now use to structure courses:  let the instructor
plan his own learning experience in whatever way he wishes, and let
students choose whether or not to participate in it.

There is no point, however, in discarding learning theory entirely.
If it cannot alone determine curricular structure, it can at least
suggest approaches.  It offers guidance which may be used at the
discretion of the teacher.  Furthermore, a modular system can serve as a
base for further practical research through the evaluation of different
methods and formats as they relate to different educational objectives,
instructional styles, and student needs.

It is the job of the experts to detail such possibilities.  Only a
few examples are suggested here.  The first of the two basic questions
raised by modularization has to do with course structure.  Gagné's model

---

[12]Donald Snygg, "Learning:  An Aspect of Personality Development,"
in Learning Theory, Personality Theory, and Clinical Research (New York:
Wiley, 1954), p. 30.

might provide a useful tool for instructors willing to spend the necessary planning time. A science methods modular offering in cardboard carpentry could be organized so as to proceed from basic concepts (various geometrical patterns) to principles (cutting along a straight line to make pieces with certain functions) to problem solving (constructing a cardboard desk). (Here, as in many cases at the university level, one can assume that students have already mastered simpler learning tasks, such as naming a particular tool. In such instances, the bottom part of the hierarchy may be safely ignored.) An added degree of sophistication could be achieved by giving a pretest covering all levels from basic concepts to problem solving. A student who demonstrated a grasp of all concepts, but only some principles, would enter the module during the unit devoted to those principles. One who could already solve problems in cardboard carpentry would, of course, skip the offering entirely. Thus Gagné's model could assist a faculty member to structure his or her course in a logical sequence, one which would protect against meaningless learning. At the same time it could help in the choice of entry and exit points.

Programmed learning is a tool which could be used in many ways to expand the School's instructional offerings. Programs might be developed to replace or enrich many existing course units. Commercial material, such as Mager's book on behavioral objectives (which is written as a branching program) could be incorporated into our curriculum. The demonstrated success of this technique can be used to great advantage.

At the same time, we can benefit from some of the criticisms leveled against Skinnerian education. For example, Sturges and Crawford have

shown that delayed reinforcement sometimes leads to better learning than immediate feedback. More effective learning occasionally takes place when an idea is first only partially mastered. Especially in the development of complex and creative ideas, an "incubation period" seems requisite. This, too, suggests a planning aid. Short modules and/or programmed learning may be most appropriate for teaching facts, the assimilation of background material. For communicating complex ideas, fostering creativity, or developing sophisticated skills, however, longer offerings may work best. Perhaps these larger educational experiences might even include incubation breaks: eight weeks of classes, three weeks without class meetings, followed by eight more weeks of instruction, to cite one possibility.

For example, the School of Education might offer a three-hour module or a programmed text on differentiated staffing for those who wished only to be able to define the term and understand how it is used. Students who wanted to be able to plan a difstaff model, on the other hand, could enroll in a long-term course, perhaps scheduled intermittently. It might be taught along Bruner's lines, emphasizing individual discovery and use of principles. If the instructor wished to heed Harlow's caveat that insight may require the rearrangement of previous learning, prerequisites could be established to insure that students know the necessary concepts. ("To enter this course, you must either pass a pretest or complete the short difstaff module.") David Ausubel suggests another tool which might be appropriate in this situation: advance organizers. These are "maximumly clear and stable" introductory materials at a higher level

of abstraction than the learning material itself, designed to explain, interrelate, and integrate the information that follows. Advance organizers could be used to start the course.

In addition to curricular organization, the other major issue in modularization involves student planning. How can a learner choose from many different instructional possibilities? How can she sequence them appropriately and facilitate their integration into her existing cognitive structure? This area is even murkier than course planning.

A few possibilities suggest themselves. The first is the necessity for clear, accurate descriptions of each instructional module. A completely modular curriculum shifts the burden of program structure further onto the student's shoulders. At the very least he should have enough information to make the best possible choices. Second, we need a better advising system, one that goes beyond just monitoring the completion of university requirements to personalized assistance in planning individualized programs. One component of such a system might be based on the independent study contract: a specific listing of objectives and a strategy for attaining them which uses both institution-generated and student-generated learning experiences. Another idea is modular offerings in decision-making itself.

There is evidence that it is easier to learn material which can be related to existing cognitive structures. In such a situation, new learning is affected by existing knowledge and existing knowledge influences new learning. The alternative is rote learning, or, in

Skinnerian terms, superstitious learning (where there is no logical connection between the stimulus and the response). The goal of advising could be stated as helping a student sequence modular offerings so that each successive learning experience is easily interrelated with its predecessors. The problem is how to practice this. Since we do not yet have techniques for accurately mapping an individual's cognitive structure, this approach may remain only a pious hope. Day to day curricular choices will continue to be based, at least for the most part, on factors such as interest, intuition, the reputation of the instructor, meeting schedule, and university requirements. But we can at least make an effort to begin improving the situation, especially since the ability to make effective curricular choices seems to be a necessary competency for students who wish maximum benefit from modularization.

Another practical application of educational psychology which could enrich the Flexible Curriculum is aptitude-treatment interaction (ATI). As the name suggests, it is an attempt to link specific instructional formats (treatments) to the strengths and weaknesses (aptitudes) of individual students. Most successful educational innovations effect a measurable improvement in performance, but do so without changing evaluation curves. The best students get better, and the poorer students, even though they may also improve, never catch up.

The Flexible Curriculum permits the same material to be presented in different ways to different students. For examples, there is evidence to suggest that individuals with low anxiety and high compulsiveness

do well in low structure situations, while those with high anxiety and low compulsiveness function best in high structure environments. Students with the first type of aptitude could, therefore, be advised to take advantage of curricular flexibility through open-ended seminars, multiple entry-exit point offerings, and independent study. Those with the second set of characteristics, on the other hand, could rely on more traditional instructional formats.

Thus modularization brings to light questions about learning which have been mostly ignored up to now. Psychology cannot offer definitive answers to these concerns, but it can suggest approaches. At this point it is necessary to explore as many alternatives as possible to test them in actual learning situations. The Flexible Curriculum provides the options to accomplish this goal, and thereby makes a major contribution to the field.

## Project Evaluation

Since the Flexible Curriculum is on the brink of implementation, there can as yet be no objective report on its success. It seems appropriate to devote instead a few paragraphs to the way in which that success will be measured over the next year and beyond. Evaluation is especially important in light of the alternative-creation strategy proposed earlier. Given that there is no way to determine a priori the best educational reforms, operational testing of various options becomes necessary. Accurate and sensitive testing mechanisms are, in turn, crucial.

Historically the discipline of education has struggled to establish
itself as a respectable academic field. In this pursuit, educators
have relied heavily on the natural sciences as a source for research
designs, statistics, and tools of measurement. The problem is that
individual human beings, the focus of education, are vastly more complex
and infinitely more unpredictable than ears of corn or chains of molecules.
Instruments designed to scrutinize the latter are woefully inadequate
to the former. The vision of educators has too long been constrained by
the limited number of phenomena which can be measured with "normal"
techniques.

At the University of Massachusetts' School of Education, the Center
for Educational Research has been wrestling with this very dilemma. One
of the answers which they have generated is Dr. Thomas Hutchinson's
model for the "operationalization of fuzzy concepts." In essence, this
is a carefully laid out series of steps which guides a project director
in translating vague goals into measurable criteria. Under the
direction of staff member James Algina, the "fuzzy concepts" technique
has provided the framework for evaluating a modular curriculum.

The first step was to isolate the major goals of this innovation.
The resulting list, generally arranged in order of priority, comprises
Appendix A of this document. It includes both the anticipated outcomes
of the Flexible Curriculum and the components which can be assumed
necessary for the achievement of those outcomes.

Many of the objectives in this list are interrelated. For example,
goals 110 and 109, "to provide a more meaningful educational experience"

and "to continue innovational momentum" are actually amalgams of several more specific objectives listed separately. Even so, there are clearly too many discrete goals in the Flexible Curriculum to permit a rigorous evaluation of each one. For reasons of practicality, therefore, we have decided to focus on a few key objectives of the highest priority, starting with 101 "to increase flexibility for students" and 102 "to be smooth running."

It is these goals which are now being operationalized through the "fuzzy concepts" model. Appendix B shows the results for number 101, greater student flexibility. It is a breakdown into a number of increasingly specific subgoals, concluding with measurable criteria. By evaluating each one of these outcomes and combining the results, we will be able to determine whether or not the Flexible Curriculum actually does offer greater flexiblity to learners. For example, one way of attaining this basic result is by having a wide range of learning experiences. One means of achieving this in turn is to generate offerings which vary in length. This is something that can be measured, by examining the percentage of total courses which are assigned 300 modules (three credits) but do not meet three hours per week for a semester, plus the percentage of offerings which are assigned values other than 300 modules.

The Modular Credit staff is now examining the Fall 1972 preliminary learning experience catalog to see how well our first attempt at creating a Flexible Curriculum has succeeded in generating flexibility for students. We will continue this process over the next year,

perhaps two, to gain a dynamic sense of the project. As Appendix B implies, this effort will generate a great deal of data, including the degree to which the total instructional program includes offerings that vary in length, intensity, definition of end point, locale, type of instructor(s), internal structure, and content, plus whether or not there exists an efficient learning experience approval system, a variety of undergraduate teacher preparation programs, and support from advisers, faculty, and administrators for students learning to use this new flexibility.

This same process will take place for the second major goal, a smooth-running project. We are, however, waiting until September and actual implementation to begin this work. When it is started, it will focus on both direct feedback from students themselves and such un-obtrusive measures as the efficiency of student registration procedures or the accuracy of modular transcripts. Furthermore, we will add as many more important goals to our testing as practical.

When fully developed, this evaluation scheme will strengthen the Flexible Curriculum in two ways. First, it will allow us not only to implement a feasible, alternative structure for higher education, but to accurately measure the success of that structure. Second, such measurements will be meaningful. They will affirm the project's original vision instead of confining it in narrow boundaries. Thus the evaluation will ultimately allow this innovation to be compared with other structures -- traditional and radical -- so that the best may be chosen.

CHAPTER   TWO

The Flexible Curriculum -- Its Organization and Operation

This section gives a detailed description of how the Flexible

Curriculum is organized and administered.  Its purpose is to offer

the reader both an understanding of what has been accomplished at the

University of Massachusetts and a model for applying the system in

other institutional contexts.  Many of the particulars of this discussion

are obviously institution-specific.  Course numbers, approval mechanisms,

computer programs, and the like will vary from university to university.

The basic approach, however, is generalizable, and should serve as a

guide in a wide variety of settings.

Before turning to a point-by-point analysis, it is important to

summarize the general model.  As has already been explained, the Flexible

Curriculum rests on the foundation of modular credit.  Learning experiences

are generated by faculty members in any desired scheduling format and

assigned a value in modules of credit (one hundred mods equaling one

credit).  Students can also formulate modular learning experiences as

independent study.  Individuals enroll in the offerings of their choice

through an internal (i.e., School of Education) registration process.  At

the same time, they register externally (i.e., with the University) for

one cover course number at a credit level equal to all of the work which

they anticipate doing during one semester at the School.  At the end of

each semester, modular credit is tabulated for every student and trans-

lated into regular credit. For example, 1585 mods becomes 15.85 credits. Decimal values (here, .85) are maintained on a student's record and applied towards future work. The student receives a Pass for the appropriate amount of regular credit under the cover course number (in this example, a Pass for fifteen credits). Finally, a transcript detailing actual work done in specific learning experiences is generated as a supplement to the regular university transcript. Thus the School of Education is free to experiment with its curriculum, yet can report to the University in terms of traditional courses and credits.

The first step in this process is to create a wide variety of learning experiences for the use of students. At our School of Education, this is primarily the responsibility of the Academic Affairs Office. For the faculty-generated curriculum, the basic tool is the Learning Experience Profile (LEX Profile). Appendix C includes samples of actual profiles which illustrate various instructional formats.

The bulk of a LEX profile is a description of the learning experience's objectives and content. This must first be approved for inclusion in the curriculum. Many offerings are based on courses which have previously been authorized by the University, and are thus automatically cleared by Academic Affairs. Some of these learning experiences have modified schedule formats; others remain unchanged. Offerings which have not received prior University approval are judged according to standard guidelines for experimental courses. Essentially, these guidelines require that the experience relate intellectually to the discipline of education. If such attempts are successful in practice, they are later submitted to the University for standard approval.

Once the content has been cleared, the LEX Profile is coded in several ways to facilitate administration (see Appendix I). This data is ultimately punched on computer cards and used to build a master file of learning experiences which serves as the basis for transcript production and statistical analysis.

After the profiles are thus processed, the offering must be scheduled. The first part of this responsibility lies with the instructor, who organizes the class sessions and chooses meeting times. An effort is made to place atypically scheduled experiences in off-peak hours (before 8:00 a.m., after 4:00 p.m., and weekends) to minimize conflicts with non-education, traditionally arranged courses. For example, a five-day intensive seminar might be taught from 4:00 to 6:30 p.m. Monday through Friday.

The next step is to find a meeting place for each offering. This is done by the Academic Affairs Office, which has control over a block of university classrooms. In the vast majority of cases, learning experiences are assigned rooms according to the scheduling preferences of the instructor. At the moment this is done by hand. Based on the experience gained during the Flexible Curriculum's first year of operation, a computer program will be written to accomplish scheduling in a more efficient manner.

When learning experiences have been approved, coded, and scheduled, they are publicized to students. Two catalogs are produced. One is a summary which lists LEX number and title, instructor(s), center or

program affiliation, meeting times, and modular credit for every offering. The second is a duplicate of each LEX profile in its entirety. Several Xerox copies of this are made for reference purposes. Thus a student makes tentative choices based on the summary catalog and confirms the choices by examining the profiles themselves. Institutions of higher education in general are increasing the lead time necessary in course planning. At the University of Massachusetts, courses are now arranged two semesters in advance. One of the Flexible Curriculum's major advantages, on the other hand, is that it permits rapid course clearance. Thus the LEX catalogs are dynamic, and are regularly updated.

The first catalog is published one semester ahead of time. It generally contains about 75 percent of the eventual offerings, including virtually all university-approved experiences as well as some experimental offerings. The purpose of this initial listing is to allow students to begin planning their program of study. It assists them in estimating how much work in education they can do (and, therefore, how many non-education courses they can take) and allows them to pre-enroll in offerings which they do not want to chance missing because of size limitations.

A major updated catalog is published at the beginning of a semester. This contains 85 to 95 percent of all institution-generated experiences. During the semester this document is updated biweekly. Initially, the revisions will be published as supplements and advertized via centrally located bulletin boards. Eventually, we hope to use a closed circuit television system to publicize recently scheduled events. This scheduling

system means that a professor who decides in the middle of a semester that a particular offering should be added to the curriculum can begin teaching immediately. It also means that last minute events (for example, important lectures by key educators) can be offered for credit. All such experiences, of course, must be approved by the Academic Affairs Office.

Students who wish to take advantage of this particular aspect of the Flexible Curriculum can either underregister (i.e., register for fifteen university credits of education but enroll in experiences totaling only 1300 mods, leaving 200 mods to be arranged later) or can change the credit level of their cover course. On the other hand, students who would be threatened by such ambiguity can plan their entire program at the beginning of the semester using only the basic catalog. This is an excellent illustration of a major feature of the innovation: the fact that many options are created, but no existing ones are destroyed. The freedom to restructure an individual program is there for those who wish to use it, yet no one is forced to do so.

This discussion has focused so far on one aspect of the curriculum: institution-generated offerings. The second component is student-generated learning. It is handled for the most part by the independent study program. Independent study is initiated by a student and sponsored by a faculty member. These two individuals negotiate a learning contract which is recorded on a standardized form (Appendix D) and submitted to the Academic Affairs Office. There it is judged by the same criteria as an experimental course would be. If approved, it is coded in a similar manner as any other learning experience (except that the first

digit of the LEX number is an "I") and added to the master file. Upon
successful completion of the offering, the student receives credit for
the work and the experience is noted on his or her supplementary
transcript with an exact descriptive title.

During the next year the School of Education and, when appropriate,
the University, will be considering a number of policy changes designed
to improve and expand the Flexible Curriculum. One of these will be
student-generated learning experiences. This would be a corollary to
the independent study program, whereby a given number of learners could
petition to have a specific offering added to the catalog. In
essence it would serve as an intermediary between faculty-initiated
experiences and one-to-one independent studies. Another policy question
is the expansion of practicums to include retroactive credit and credit
for paid work. Finally, an effort will be made to allow non-faculty
to teach certain learning experiences. Although an undergraduate or a
community member may not be competent to instruct a multiple week,
intensive course, it is entirely possible that such people are able to
teach a short term seminar in an area of particular interest and
competence.

Under the traditional course-credit system, students register for
courses at the beginning of a semester and receive credit for their
work at the conclusion of that semester. In essence, they make an all
or nothing contract with the university. They either complete the entire
course satisfactorily and receive credit, or they fail to do so and
receive no credit.

There are three major differences between this process and the Flexible Curriculum. The first is modular credit itself, which is a far more sensitive monitoring instrument than large credit units. It has already been noted that modular credit is linked to the same time expectations as standard credits. A three-credit course meets three contact hours (fifty minutes each) per week for an entire semester (which, at the University of Massachusetts, varies from thirteen to fifteen weeks). Three credits, therefore, represent between thirty-nine and forty-five contact hours plus outside preparation (usually calculated on a two-to-one basis, or about eighty hours of preparation for three credits). Thus 300 modules of credit also are equivalent to approximately 120 hours of work (forty contact hours in class plus eighty hours of preparation). Other credit levels are determined in the same manner: forty hours for 100 modules, sixty hours for 150 modules, etc.

The time-linked credit principle will frequently be applied on an average, not an exact, basis, so as to avoid an overemphasis on amassing credit in ten-minute blocks. For example, a fourteen-week learning experience which meets three contact hours per week is clearly a traditional three-credit course, and would thus be valued at 300 mods. Since a seven-week LEX meeting six hours each week involves the same amount of time, it, too, would be worth 300 mods. If it met three hours instead of six, the value would be 150 mods. On the other hand, a seven-week three-session per week experience with reduced preparation (for instance, a series of lectures without substantial readings and with no papers

or exams) would be assigned fewer mods, perhaps seventy-five. The point
is that modules of credit can usually be calculated by referring to the
three-credit norm. This model can even be applied to competency-based
offerings. Here, modular credit is assigned according to the time
spent by the average student in satisfactorily achieving the performance
criteria.

Thus the first major difference between the traditional registration
process and the Flexible Curriculum is the use of modular credit instead
of traditional credit, even though the two are both calculated on the
same basis. The second can be labeled post hoc registration. One of the
specific operational goals of this project is to free students from the
necessity of the all or nothing a priori contract. A great deal of
threat can be excised from education if the specter of failure is itself
exorcised from learning. Post hoc registration is one way to accomplish
this.

What the Flexible Curriculum does is to allow students to
renegotiate their learning contracts at any point during a semester.
This benefit is achieved via the cover number approach. By dividing
registration into two steps -- internal, at the School of Education, and
external, at the University level -- students win registration flexibility
without necessitating drastic procedural changes in the central administra-
tion. Externally, all students register for the same course,
Education 386/686, Special Problems in Education, for any number of credits
they wish. If necessary, the credit level for this cover number can be
revised in the middle of a semester. Normally, however, it is the

internal registration process which gives flexibility.  Having contracted

for a block of credits with the university, the student distributes his

work at will by enrolling in specific learning experiences.  The key is

that the same student can redistribute his work at any time.  If he

enrolls in a learning experience and decides three quarters of the way

through that he has learned (or not learned) enough, he simply drops out.

If the instructor has set this time as an exit point, the student

receives three-quarters credit.  If not, and the faculty member decides

that only the total experience is educationally worthwhile, the student

receives no credit.  In neither case, however, does he fail, as he would

under a traditional system.  The only penalty for early exit is not

receiving full credit and the resultant delay in a program of study.

This is a legitimate result, and should serve as a brake on any

tendencies to dilettantishly float in and out of offerings.  At the

end of each semester credit is reported to the university and registered

under the cover number.  The end result of all this is to approximate a

system where students register for credit at the conclusion, not the

beginning, of a learning experience:  a post hoc registration system.

It has already been noted that a political compromise was implemented

at the eleventh hour, just before the Flexible Curriculum was to begin

its first year of operation.  Because it offers no academic benefits to

the system, and because it will hopefully disappear after one year, there is

no need to discuss it in depth.  In essence, the compromise modifies

the external registration process so that several course numbers are used

in noting modular credit on the University transcript.  This complicates

the administrative task, especially in orienting students on registration procedures and revising (when necessary) the external credit level. In order to reduce the negative impact of this change, however, the School itself will assume the bulk of this additional burden. From a student's perspective, therefore, the Flexible Curriculum should operate as originally planned. Since the one cover number system is the unadulterated mechanism, and since we hope to reinstate it at the earliest possible date, there will be no further reference to the multi-number compromise in this document.

The final difference between a traditional and a modular record keeping system is that the latter is pass-no record. This, too, helps remove the illegitimate threats of failure which have already been discussed. Many educators today are questioning the value of letter grades as an evaluation mechanism. A common alternative is pass-fail. Unfortunately, this system continues to penalize students for unsuccessful attempts at learning by noting them on a transcript. Under pass-no record, on the other hand, the transcript records only satisfactory work. Since credit-defined degrees are not monitored in terms of failure, pass-no record is administratively adequate -- and it offers the basic psychological advantage of reduced threat. In order to insure excellence, of course, it must be linked to other evaluation mechanisms. One of the project goals is to produce a handbook linking specific instructional objectives and formats to specific evaluation techniques. The goal of pass-no

record is not to eliminate feedback on student performance, but only to improve it by purging undesirable side effects.

Again, it is the dual registration system which allows pass-no record in the Flexible Curriculum. Internally, records are kept only in satisfactory work. Externally, this work is reported under the cover number as "pass." Unsatisfactory work is simply not officially noted. For example, if a student attempts 1500 modules in one semester, but only completes 1400 successfully, he would receive a pass for fourteen credits of Education 386/686 and a supplementary transcript showing all satisfactory work, but not showing the 100 mods which were not completed. These three aspects of the Flexible Curriculum's registration procedure -- modular credit, post hoc registration, and pass-no record -- help make the system unique and provide the administrative flexibility which in turn allows significant curricular variation. They transform semesters into nothing more than convenient reporting points. In fact, it is hoped that eventually (with University cooperation), the semester will disappear completely in favor of continuous accounting.

The details of registration are fairly simple. Most students set up at least a preliminary study program during regular University preregistration and/or registration periods at a central location and specified time. At this point, they obtain copies of the School of Education's preliminary learning experience catalog and decide in which offerings to enroll. Each experience has a class roster, which indicates numerical capacity, meeting times, and any prerequisites. (A sample roster is included as Appendix E.) If there is space in the experience,

a student simply signs his or her name and student number on the roster. At the same time, he or she notes the experience (by LEX number and title) on two schedule cards (illustrated in Appendix F). When the individual has arranged for the desired number of learning experiences, he or she returns one schedule card to the School and keeps the second as a personal record.

Next the student estimates the total number of Education credits which he or she expects to earn during the semester. This figure is based on three factors: interest in previously scheduled learning experiences, anticipated participation in offerings to be arranged during the semester, and course requirements outside of Education. For example, an undergraduate who expects to take one biology course might estimate twelve credits of Education work (a normal load of fifteen credits minus three for the biology course). Of these twelve credits (1200 mods), she might actually be on the rosters for 1050 mods, and anticipate finding another 150 mods as the semester progresses. The student then registers for the estimated credit level under the cover number -- in this case, twelve credits of Education 386 -- and pays the appropriate tuition plus fees.

During the semester a student can modify this registration at will. Internally, this is accomplished through a LEX add/drop form (Appendix G). It is used any time a person wishes to change his or her schedule by adding an experience, dropping an experience, or changing the credit level of a variable mod offering. This form results in the appropriate changes on the School's copy of the schedule card and on the affected rosters. It is the student's responsibility to change the personal schedule card.

Note that it is entirely possible for a student to register for, as an example, twelve cover credits without enrolling in any specific learning experiences until a later date.

If at any time during the semester, it becomes evident that a student's original credit level estimate was incorrect, he or she can modify the external registration through the University add/drop process. For example, a student who decides to do extra work in Education could drop twelve credits of Education 386 and add fifteen credits. This modification can also be done at the end of a semester, once actual mod totals are calculated. In fact, final credit level revision is accomplished automatically via the supplementary transcript computer programs, which also indicate when tuition cost has been affected and a supplementary bill (or refund) is due. Among other benefits, such a system eliminates incompletes, which are an administrative nightmare for both students and faculty. By lowering the number of cover credits when it becomes clear that work in a given learning experience will not be finished in time, and recording the mods in a subsequent semester when they are completed, the post hoc registration process avoids the necessity for incomplete grades.

In order to accomplish the administrative details of internal registration, the School of Education uses the services of a full-time Registrar. This person organizes preregistration and registration periods, handles ongoing registration, keeps rosters up to date, monitors lab fees, edits supplementary catalogs, maintains modular records, and provides information on available offerings to the advising staff. The

Registrar is located in a central office along with representatives from the advising office. This procedure allows students to transact any and all administrative business at one location, and makes the system relatively easy to negotiate. For instance, traditionally students had to locate instructors on their own to gain admission to "by permission only" courses. Under the Flexible Curriculum, the Registrar will have information on any prerequisites to learning experiences and will be able, in the majority of cases, to give students approval to take such offerings on the spot.

Parallel to the dual registration process described above is a dual record keeping system. Externally, at the University level, a student's work will be summarized on regular transcripts. That is, standard University transcripts will show the total number of credits earned at the School of Education under the cover course number. Obviously, however, additional information is required for advising, teacher certification, and placement purposes.

This need is met through an internal, School of Education record keeping system. It is designed to produce supplementary transcripts which are filed with normal university transcripts and list each individual learning experience satisfactorily completed. An example of one of these internal transcripts is given in Appendix H. They are produced by computer. Information on each experience is placed in a master LEX file. When an offering has concluded, the instructor returns the class roster to the central office, noting how much credit each student

has earned. These rosters, in turn, are punched onto IBM cards, which are used to build a data file for every student. Supplementary transcripts are generated once per semester on the basis of this information. Program specifications for the system are given in Appendix I. (During the first year of operation, back-up records will be kept on paper to minimize the problems which may occur as the computer programs are debugged and refined.)

Internal transcripts provide a detailed record of each student's program of study. (Even independent study experiences are listed individually, with an exact descriptive title.) They allow more effective, in-depth academic advising and offer a great deal of information to prospective employers or for the purpose of admission to other institutions. They also can be used for teacher certification. All of the University of Massachusetts' alternative teacher education programs are designed to meet certification requirements not only in Massachusetts itself, but also in a number of other states. Those states requiring more information, however, will find each learning experience categorized according to general certification areas: student teaching, curriculum and methods, administration, foundations, etc. (see Appendix I). This categorization makes the records easy to process, even when the user is not intimately familiar with a modular administrative system. The supplementary transcripts are augmented by each student's advising and placement portfolios, which contain background information on every offering completed and a description of relevant teacher preparation or graduate degree programs.

One of the frequent concerns raised in relation to the Flexible Curriculum is its costs to students. Flexibility won on the basis of intolerable complexity is no victory at all. Thus a major project goal is to be smooth running. One of the ways to achieve this is through adequate planning. Another is to have an effective advising system.

In reality, the Flexible Curriculum does not in itself require any reorganization of student counseling. At the School of Education this task will continue to be the responsibility of the Assistant Deans for Undergraduate and Graduate Affairs. Their offices provide a staff of advisers whose job includes helping students negotiate the administrative mechanics of their degree programs and working with the same students in developing individual programs of study appropriate to their personal and professional objectives.

What the Flexible Curriculum does do is to change the rules of the institution. This means that advisers must orient students to a modified administrative system. More important, it means that students are able to better use institutional resources in meeting their own needs. Advisers must understand and communicate this new potential.

On the administrative level, there has already been one operational test of student reaction to the Flexible Curriculum's procedures: Fall 1972 preregistration (held during the preceeding Spring). The results were most encouraging. Two orientation methods were used. One was simple, written, step-by-step descriptions of the modular registration process. The second was a large staff drawn from the Advising and Modular Credit Offices on hand to answer questions and give detailed

information.  Thanks to this combination, most students quickly mastered the specifics of a dual registration process.  Some did complain about the new procedures, which they perceived as added complexity.  But they were easily outnumbered by those who were excited about the new system, who already had begun to realize the direct benefits of the Flexible Curriculum.  Orientation efforts will continue with special intensity during the first year of the program.  Not only will further material be prepared for student use, but training sessions will also be conducted for the advisers themselves.

As far as academic advising goes, the Flexible Curriculum gives students a vastly increased number of choices to make in structuring their individual programs.  Those who wish to use this potential fully will need assistance in clarifying their objectives and help in deciding what combinations of learning experiences, independent studies, and practicums best meet those objectives.  A number of learning experiences on decision making, goal setting, career possibilities, etc., will be offered to facilitate this process.  The Registrar will play a critical role here in keeping advisers informed on available instructional options and answering administrative questions.  The supplementary transcripts, providing an in-depth record of a student's progress, will also be important.

Some students, on the other hand, may not wish to deal with so many decisions.  Those individuals must be served, too.  For undergraduates of this inclination, there are a number of teacher preparation programs which are highly structured.  By entering one of these tracks, a student

can choose to have few choices. To achieve the same result, graduate students can ally themselves with one of the several learning centers in the School which set up required or suggested programs of study.

Basically, then, the implications of the Flexible Curriculum for advising are a new set of administrative procedures, more instructional options, and greater flexibility in helping the institution serve its students. None of these should pose any insoluble problems for the offices of Undergraduate and Graduate Affairs or their clients.

To summarize, the Flexible Curriculum uses a dual registration and record keeping system as its administrative foundation. This process permits the School of Education great latitude in organizing its curriculum and allows students a high degree of flexibility in arranging their own work. At the same time, it reports to the University in traditional terms, via credits and semesters. The whole system is analogous to the engineer's "black box." Input is received and processed via mechanisms which, from the point of view of most students, faculty, and even administrators, are hidden. Output is produced which has been translated into an easily recognizable format. If the university as a whole were not bound to the standard credit system, this black box would obviously be unnecessary. Until that innovational milestone is reached, however, the Flexible Curriculum offers an efficient and politically expedient transition.

# CONCLUSION

Since 1968 the School of Education at the University of Massachusetts
has been committed to innovation through alternatives. The formal
educational system in the United States is based on a set of unquestioned
assumptions which have locked schools into a single way of doing things.
No one knows whether traditional approaches to teaching and learning
are the best or the worst possibilities. At the moment, they are the only
possibilities.

Resolution of this problem requires two things: the vision to
imagine and define new educational techniques, and the courage to test
them even at the risk of failure. This has been the School's basic
goal, not only in our off-campus service, but especially within our own
walls. From new standards of admission to new definitions of professional
competence, from alternative teacher preparation programs to alternative
inservice education ventures, from innovative internal organization
to innovation internal governance, the School of Education has actively
pursued new horizons for a stagnant discipline.

The Flexible Curriculum is but one of the alternatives produced
by this revolution. It is certainly not the most radical, for it shares
some very basic features of the existing means of packaging instruction.
Yet it is not a trivial modification, either. By expanding on the simple
expedient of dividing credits into smaller modules of credit, this
innovation adds previously unrealized flexibility to the options

available for faculty, students, the community, and the institution itself. At last format can be determined by content and individual aptitudes, instead of content and aptitudes being strictly constrained by format. Furthermore, a carefully planned administrative system allows such freedom within the larger context of a traditional credit system. The translation of modular records into regular course numbers and credits means that this alternative is available to all institutions of higher education ready for change but unwilling to rush into a radical break with the past.

The last 1800's were the setting of round one in the fight for responsive educational administration: credits and elective courses. To the 1970's now belongs round two. The Flexible Curriculum, as well as companion alternatives, yields new benefits for education. But there will also be round three, four, five, and on. Modular credit is an appropriate step. Not only can it produce immediate results, it can also generate the experience and research data necessary to plan its successors. But a step is not the entire journey. No one can see around the temporal corner clearly enough to predict the next move in the monitoring of learning. It could be competency-based education, portfolios, new definitions of degrees, no degrees at all, or something else entirely. But a clear prediction is not important. What is important is the expectation that more reform will follow.

It has been almost a full century since Charles Eliot first conceived of credits as an educational innovation. Over these years the idea

matured, flourished, and finally sank into senility. Hopefully the Flexible Curriculum will offer enough worthwhile fruits to ensure its maturation, too. But inertia remains a constant threat; the social penalties for submission to it continue to grow. Let us also hope that another hundred years do not have to pass before educators again evaluate the structure of higher education and move on to something even better.

APPENDIX A

Project Goals

101. To increase flexibility for students

    101.1  To increase flexibility for students with primary emphasis on undergraduates

    101.2  To increase flexibility for students with secondary emphasis on Master's students

    101.3  To increase flexibility for students with tertiary emphasis on doctoral students

102. To be smooth running

    102.1  To have by the second year a level of confusion less than it is now

    102.2  To have by the second year a level of confusion no greater than it is now

103. To have useful undergraduate advising procedures

104. To offer flexibility to the School itself

105. To have useful undergraduate counseling procedures

106. To stimulate a significant percentage of the School of Education faculty members to question their regular pedagogic styles in light of CMC structural options

107. To have the possibility through diverse options of formulating an articulate cohesive program

108. To provide an opportunity to meet individual needs

109. To continue innovational momentum in the School

110. To provide a more meaningful educational experience

201. To provide freedom from the necessity to make every learning experience last a semester.

202. To provide freedom from being forced to participate in irrelevant learning experiences

203. To meet the goal of developing viable educational alternatives

204. To evaluate the program

205. To provide multiple entry and exit points in learning experiences

206. To orient students to the Flexible Curriculum

207. To find resources for advising

208. To have a diversity of learning experiences

209. To have faculty think critically about their goals for the learning experience

210. To have faculty consider if they make optimal use of resources to meet their learning experiences

211. To increase flexibility for faculty

212. To increase the number of choices available for building an individual program


301. To avoid fragmentation of a learning experience to the point where it becomes dysfunctional

302. To facilitate internalization of learning experiences

303. To develop skills in accurate self-evaluation

304. To have faculty collaborate on integrative efforts to provide learning experiences

305. To be a first step towards eliminating credits

306. To have an effect on other departments in the university

307. To have an effect on other institutions

308. To test different curricula

309. To test different educational formats (durational and scheduling)

310. To allow a student to vary a program at any time in the semester

311. To provide opportunity to vary workload

312. To provide a chance to focus more exactly on specified areas of interest in class

313. To provide opportunity to adjust teaching schedule for maximal professional growth

314. To better use time

315. To use resources more efficiently

316. To provide opportunity for greater use of community resources

317. To upgrade the School of Education by correcting existing faults

318. To facilitate student choice of professional goals

319. To facilitate student choice of personal goals

320. To implement a resource "clearing house" to assist in tracking down resources based on student requests

321. To arrange new modules not currently planned, based on specific student requests

322. To assist in making arrangements for unusual field experiences

323. To match student needs with resources

324. To implement a streamlined course approval system

325. To publicize effectively new learning opportunities

326. To encourage student-initiated learning experiences

401. To provide easier access to the School of Education for the community

402. To implement a portfolio evaluation system

403. To reschedule modules based on specific student requests

501. To insure a high potential for change and improvement with a relatively low level of risk

502. To orient students in ways to cope with university life

APPENDIX B

Preliminary Operationalization of Project Goal No. 101
("To Increase Flexibility for Students")


101.1  Offer a wide range of LEX's

101.11  LEX's vary in length

101.111  A percentage of total credits offered for institution-
generated LEX's that are 300-mod experiences but do
not meet three contact hours per week

101.112  A percentage of total credits for
         0 -  25 mod credits
        26 -  50 mod credits
        51 - 100 mod credits
       101 - 200 mod credits
       201 - 300 mod credits
       301 - 600 mod credits
       600+      mod credits

101.113  A percentage of courses for the categorization
scheme

101.12  LEX's vary in intensity

101.121  Intensity -- the percentage of total time spent in
a unit session

101.122  Intensity reported within framework of above
categorization scheme

101.13  LEX's vary in definition of end point

101.131  Credit given on the basis of competency at any time
during course

101.132  Credit given retroactively for experiences outside
of university, that took place prior to enrollment
or during periods of withdrawal from the university

101.14   LEX's vary in setting

    101.141   Information gained from an outside source --
lecture, seminar, library work

    101.142   Information gained experientially but consolidation
of information takes place in classroom setting --
practicums with class discussion

    101.143   An experience totally outside the classroom and/or
university -- a practicum with no class discussion
or field work with no class discussion

101.15   LEX's vary in instructors

    101.151   The following can instruct:
University teaching staff; doctoral students;
CAGS students; Master's students; teaching
certificate students; undergraduates; professionals
outside the university; non-professionals outside
the university

101.16   LEX's vary in content

    101.161   Increased quantity of course units

        101.1611   Old courses that were modularized

        101.1612   Old courses that have entry and exit points
(institution-generated)

        101.1613   Courses that didn't previously exist but are
for more than or less than 300 mods

        101.1614   A university teaching staff member freed by a
non-doctoral student teaching an old course
to teach a new course

        101.1615   A university teaching staff member freed by
structural options to teach a new course

101.17   Have a quick, efficient School of Education-centered
course approval mechanism

    101.171   Within a semester a course must be acted on within
the necessary lead time

    101.172   Within a year (i.e., across semesters) a course must
be acted on within the lead time

101.2  Have flexibility for students within a course

    101.21  Students can enter and exit LEX's at other than terminal points and still receive credit for proportion of work completed with faculty approval

        101.211  Enter and exit at instructor pre-specified points

        101.212  Enter and exit at individually negotiated points

    101.22  Students can modify institution-generated LEX's before starting and/or while they are in progress

101.3  To have flexibility in undergraduate teacher preparation programs

    101.31  To have programs with high structure (i.e., all program choices are already made)

    101.32  To have programs with low structure (i.e., programs that exist, but with no rigidly defined routes for completion)

    101.33  To have several programs develop alternative ways to meet their requirements

    101.34  To have students affect the form of the programs

101.4  To have support for students in using flexibility

    101.41  To have advising and counseling support students in defining learning goals

    101.42  To have advising and counseling support students in defining personal goals

    101.43  To have faculty with time for student contact

        101.431  Student perceives faculty as having time for student contact

        101.432  Amount of time each professor has

    101.44  To have an ombudsman

    101.45  To have loose boundaries between faculty and students

101.5  Miscellaneous dimensions of flexibility for students

    101.51  To create a mechanism for LEX's to occur even when school
             is not in session

    101.52  To have a wide range of specific tools for evaluating
             student progress towards goals

    101.53  To have these tools publicized

    101.54  To have a wide range of student-generated LEX's

APPENDIX C

Sample Learning Experience Profiles

The following are actual copies of LEX profiles.  Most of the information therein is self-explanatory.  The modular credit for each learning experience is shown in the upper right-hand corner (section D). The learning experience number is given in the lower right-hand section of the profile.  (On these early forms, it is incorrectly labeled "course and section number".)

Each of these offerings illustrates a different instructional format (or, occasionally, a combination of formats), as follows:

| LEX Number | Instructor | Format |
| --- | --- | --- |
| 3495 | Jordan | single session |
| 4220 | Blanchard | short term, intensive |
| 3195 | Eiseman | multiple week, intensive |
| 8020 | Hutchinson | multiple week, low intensity |
| 4960 | Peelle | long range, multiple entry-exit |
| 3175-8 | Glenn | multiple entry-exit |

UMass - Amherst - Sch of Educ.   LEARNING EXPERIENCE PROFILE   Phone   5-0875

Office of Academic Affairs                                    Office   A125 GRC

Fall 1972                                                     Office Hrs. _____

**A.   Instructor (s)**

Jordan                                                        *Human Potential*

**B.   Name of Learning Experience**

Racism and the Suppression of Human Potential

**C.   Time Schedule**                    **D.   Mod Cr Cap:** UG   40

10/10/72   11-12:30 pm                       UG 10              20
                                             G 10          G
                                                     Total   60

**E.   Aim and Content of Learning Experience**

The nature of human potential is discussed along with the particular experiences that are
prerequisite to an optimum development of potential per unit time.  Racism will be defined
and the dynamics of suppression of human potential discussed at length.  Particular
emphasis will be placed upon those dynamics as they occur in educational settings, in-
cluding the classroom.

Organization:   (x)Lecture   (x)Discussion   (x)Seminar   ( )Practicum   ( )Lab

**F.   Readings** (suggested and required)

Bibliography and handouts provided ___

**G.   Requirements** (papers, exams, lab fees, etc.)

session attendance

**Prerequisites**

**I.   Lab Fee**   Amount:  $
                   Use:      none

**J.   Final Exam Room Required** ( )Yes   No (x)

**K.   Special Room Instructions**

Blackboard

**L.   Room Assignment**

| UMass - Amherst - Sch of Educ. | LEARNING EXPERIENCE PROFILE | Office: Hrs Tu 9-12; Wed 1-3 |
| Office of Academic Affairs | | Rm 223D  Phone 5-1589 |

Fall 1972

**A. Instructor (s)**

Kenneth H. Blanchard

Center/Program _____ CLA

TPPC Program _____

**B. Name of Learning Experience**

School Leadership and Decision-Making Workshop

**C. Time Schedule**

Fri, Oct. 27 3:35-10:35
Sat, Oct. 28 9-5 p.m.          Sun, Oct. 29 9-5p.m.

**D. Mod Cr.** 135

**Cap:** UG _____
G ——
Total 40-60

**E. Aim and Content of Learning Experience**

MCL

To (1) increase knowledge of Leadership and Organizational Behavior Theory
(2) begin to apply theory to real life situations in schools
(3) increase understanding of how problem-solving groups operate
(4) increase knowledge of own personal style in groups

Students will work in intense small (5-6) work groups throughout the
weekend on cases, movies, simulations and role-playing designed to make the
theories "come alive".

Organization:  ( )Lecture  (X)Discussion  (x)Seminar  ( )Practicum  ( )Lab

**F. Readings (suggested and required)**

7-10 hours of pre-work to be assigned

**G. Requirements (papers, exams, lab fees, etc.)**

$2.00 lab fee

**H. Prerequisites**

11-20 rating on content exam

**I. Lab Fee**  Amount: $2.00
Use: film, simulations, refreshments.

**J. Final Exam Room Required** ( )Yes  No(x)

**K. Special Room Instructions**
movable tables and chairs/need 10 rooms
throughout weekend/herter hall prefered

**L. Room Assignment**

( )                    ( )

UMass – Amherst – Sch of Educ.
Office of Academic Affairs

LEARNING EXPERIENCE PROFILE

Fall 1972

(116)

Phone 5-1575/253-2932
Office 200, Ed. Bldg.

**A. Instructor (s)**

Dr. Jeffrey W. Eiseman

Office Hrs. T, 1-4 PM

**B. Name of Learning Experience**

Designing Curricula to Foster Self-Actualization

**C. Time Schedule** Tuesday, September 12: 7:45 PM - 10:45 PM
plus 3 Saturday sessions 9:30 AM - 3:30 PM
on September 16, November 4 & November 18

| D. Mod Cr | Cap: UG | 15 |
| --- | --- | --- |
| 200 | G | 25 |
| | Total | 40 |

**E. Aim and Content of Learning Experience** This 200-module package is the 2nd part of
a 2-part sequence totalling 500 modules. For undergraduates, the first part
("Implications of Theory for the Integrated Day Movement") is a prerequisite,
although both may be taken concurrently. Graduate students may elect the
option of preparing for this package through independent reading. Whereas
the first part counts as the foundations portion of the Massachusetts
teacher certification requirements, this package counts as the methods
portion of the Massachusetts requirements.

Students, in interaction and collaboration
with the instructor, will practice developing environments containing the
following conditions: stimulation consistent with the principle of optimal
disparity, opportunities for activity, freedom of choice among equally
attractive options, affective involvement, role taking, responsiveness,
and reflection. More specifically, they will practice designing, partici-
pating in, and conducting growth opportunities which constitute variations
of the following format: diagnosis-set induction-confrontation-action-
reflection-inquiry-commitment-evaluation.

Organization: ( )Lecture  ( )Discussion  ( )Seminar  (x)Practicum  (x)Lab

**F. Readings** (suggested and required)

Mimeographed handouts.

**G. Requirements** (papers, exams, lab fees, etc.)
1 under-ten page write-up of experiences
and learnings.

**H. Prerequisites** For undergrads: "Implica-
tions of Theory for the Integrated Day
Movement"; for grads: independent reading

**I. Lab Fee** Amount: $ 2.50
Use: Surplus duplicating

**J. Final Exam Room Required** ( )Yes  No (X)

**K. Special Room Instructions** Must have
blackboard and moveable chairs.

**L. Room Assignment**

| UMass - Amherst - Sch of Educ. Office of Academic Affairs | LEARNING EXPERIENCE PROFILE  Fall 1972  ⌒246⌒ | Office:  Hrs by appt. Rm 112  Phone 5-0179  Center/Program *CER* TPPC Program _____ |
|---|---|---|

**A. Instructor (s)**

Tom Hutchinson

**B. Name of Learning Experience**

Integrating Research Related Experiences

**C. Time Schedule**

By arrangement

| D.  Mod Cr. | Cap:  UG _____ |
|---|---|
| 100 | G  only |
| | Total |

**E. Aim and Content of Learning Experience**

The goal of this experience is for the participant to produce and carry out a plan for obtaining knowledge and skills in the research area as they relate to the student's major area of concern.

The content will include goal identification, selection and testing of alternatives, development of a plan for accomplishing goals, evaluation, redesign of plans, implementation of plans, and final evaluation.

Organization:  ( )Lecture  (X)Discussion  ( )Seminar  (X)Practicum  ( )Lab

**F. Readings** (suggested and required)

Individually assigned

**G. Requirements** (papers, exams, lab fees, etc.)

program of study, working papers

**H. Prerequisites**

by permission

**I. Lab Fee**  Amount: $  Use:

NONE

**J. Final Exam Room Required** ( )Yes  No(X)

**K. Special Room Instructions**

NONE

**L. Room Assignment**

UMass - Amherst - Sch of Educ.  
Office of Academic Affairs

LEARNING EXPERIENCE PROFILE  
Fall 1972  (34 4)

Office: Hrs TWTh 2-4  
Rm 21B  Phone 545 - 2889  
Instructional Applications  
Center/Program of Computers  
TPPC Program _____

**A. Instructor (s)**  
Howard  A.  Peelle

**B. Name of Learning Experience**  
"Teaching Children Thinking"

**C. Time Schedule**  
MON/WED  10:00 a.m.  September 20

**D. Mod Cr.** 400

**Cap:** UG _5  
G _5  
Total 10

**E. Aim and Content of Learning Experience**

Aim: To explore the use of computer programming languages as a conceptual framework for teaching children.

The course has four component parts (over two semesters):

(Fall, 1972)  I.  APL TUTORIAL PROGRAM  (100 modules credit)  
#4960  
5th and 6th grade children (from Mark's Meadow Elementary School) receive tutoring in fundamentals of computer programming in APL and/or LOGO languages.

(Fall, 1972)  II.  CURRICULUM DESIGN AND DEVELOPMENT  (300 modules credit)  
#4961  
Modular instructional units ("learning kits") are conceptualized, designed and developed for use by elementary school children on a time-sharing computer system in subject areas such as: algebra, computational geometry, cybernetics, linguistics, and computer art.

(Spring,1973)  III.  CURRICULUM TESTING AND EVALUATION  (200 modules credit)

(Spring,1973)  IV.  THEORY OF THINKING  (200 modules credit)

Organization: ( )Lecture  ( )Discussion  (x)Seminar  ( )Practicum  (::)Lab

**F. Readings** (suggested and required)  
M.I.T.'s Artificial Intelligence Lab Memo Series, S. Papert

**G. Requirements** (papers, exams, lab fees, etc.)

**H. Prerequisites**  
Computer Programming + Teaching Experience

**I. Lab Fee**  Amount: $12  
Use: Computer Disk Storage

**J. Final Exam Room Required** ( )Yes  No(x)  
**K. Special Room Instructions**  
Computer Terminal + Dataphone

**L. Room Assignment**  Room 21B (School of Ed)

FOR OFFICE USE ONLY  
Course and Section # 4960, 4961  
Abbreviated Title  
TEACH CHILDREN THINK

| | Cap | Pre-Reg | Final |
|---|---|---|---|
| UG | | | |
| G | | | |
| TOTAL | | | |

Book Order Forms submitted ( )  Lab Fee ( )

| UMass - Amherst - Sch of Educ. Office of Academic Affairs | LEARNING EXPERIENCE PROFILE  Fall 1972 (12) | Office: Hrs Tu & Thu 10 - 12 Rm 227-B Phone 545 - 0942 |
|---|---|---|

**A. Instructor (s)**

Center/Program Foundation
TPPC Program _____

Dr. Hodges Glenn, Sr. (Faculty Member)

**B. Name of Learning Experience**

Ed. 686 - CROSS-RACIAL - CROSS-CULTURAL EXPERIENTAL LEARNING & MINORITY INSTITUTIONS

| C. Time Schedule | D. Mod Cr | Cap: | UG | 0 |
|---|---|---|---|---|
| wed 3:35 - 6:05 | 300 | | G | 35 |
| | | | Total | 35 |

**E. Aim and Content of Learning Experience**

General Aim:

The major concern of this "Cross-Racial - Cross-Cultural" learning experience is to provide a foundation in "Trans-Racial" education for those who plan or desire to work in a multi-cultural setting. Much emphasis is placed on "self-assessment" of personal values attitudes, and habits related to working with people who are culturally different.

Content Areas: 300 Mods serve as the rationale for this experience. However, each mod is presented as a complete learning experience or concept.

3176
(1) The first 100 Mods will provide a philosophical and historical basis for under-standing and appreciating the outstanding contributions of Black and other minority institutions in America.

3177
(2) The second 100 Mods will focus on specific current issues and problems related to Black and White colleges and universities in the '70's. The nature of Equal Educational Opportunity institutions - their educational and politi-cal roles in a multi-cultural society will also be explored, as well as the problem of employment and racial conflict.

3178
(3) The third 100 Mods will spot light various special problems related to their growth and development in various geographical locations in this country. The affects of racism on their operation, survival, and future will also be studied and explored.

Organization: ( )Lecture (x)Discussion (x)Seminar ( )Practicum ( )Lab

**F. Readings (suggested and required)**

Selected readings and xeroxed materials will be given

**G. Requirements (papers, exams, lab fees, etc.)**

Research papers related to the experience

**H. Prerequisites** None, but experience in tutoring, teaching or administration might help

**I. Lab Fee** Amount: $ $ 2.00 Use: xeroxed materials

**J. Final Exam Room Required** ( )Yes No(x)

**K. Special Room Instructions**

An Overhead Projector will be needed

**L. Room Assignment**

APPENDIX D

Sample Independent Study Contract

Academic Affairs Office
SCHOOL OF EDUCATION          (OFFICE COPY)
University of Massachusetts
Amherst, Mass. 01002

# INDIVIDUALIZED STUDY CONTRACT

Please Print
NAME *Susan Marie McCarthy*

STUDENT NUMBER
*5887299*    ○ GRADUATE    ☑ UNDERGRADUATE

HOME ADDRESS *49 Kipling St.*
*Springfield, Mass 01118*

LOCAL TELEPHONE NUMBER *732-1941*

PLEASE PRINT
SPONSORING INSTRUCTOR'S NAME    CENTER AFFILIATION
*Mr. John Byron - Mark's Meadow    Teacher*

BRIEF DESCRIPTIVE TITLE
*Developing Objective Banks - Physical Health*

MODULES OF CREDITS*
*If exceeds 600 (except dissertation — 1500), Dean of Academic Affairs initials required.    [300]*

TYPE OF GRADE DESIRED
Pass/Fail    ✓
Graded (Master only) ✓

STATEMENT OF OBJECTIVE(S) (Additional information may be attached if desired.)

To develop performance objective-banks in Physical Health for the Early childhood curriculum.
To help the child to:
① Establish an understanding of what food is
② Know that certain foods are needed every day.
③ Acquire good foods habits.
④ Understanding that eating good food is an enjoyable experience.
⑤ Appreciate the importance of good health habits for "safe" food.
⑥ Appreciate the need for co-operation between home & school in nutrition education.

PLANNED ACTIVITIES

Creating a resource center of performance objectives that will help to individualize this type of instruction - using a multi-media approach. etc.

CRITERIA FOR EVALUATION (Paper, Log of Activities, etc.)
Log of activities - Plus the Performance Objective & Activity cards will be used to evaluate
Susan McCarthy

APPROVAL SIGNATURES:
*Susan Marie McCarthy    May 26*
(Student)    (Date)

*John Byron    May 26*
(Instructor)    (Date)

TO INSTRUCTOR: Please fill in this section on blue form and return to Central Office, School of Education, when work is completed.

_____    FINAL GRADE
(Instructor's Signature)

Date Completed: _____

APPENDIX E

Sample Learning Experience Roster

Center/Program___Foundations_____. Pg _21_ of____

### CENTRAL OFFICE ROSTER

The following is a listing of students who are officially registered for your learning experience. At the end of the experience, please fill in the appropriate columns and return to the Central Office (Room 121).

Learning Experience__Cross-Racial, Cross-Cultural Experien- Exp # __3175__
                                              -tial Learning
Instructor(s)__Dr Hodges Glenn_____ Cap: U __0__    G _35_____

Beginning and Ending Dates_WED._____ Mod Cr _300_ Rm _____

Hours____3:35 - 6:05 P.M._____ Days_____

| Name | Student # | U/G | Pre reg | Reg | Add (Date) | Drop (Date) | Pass/ Fail | Mod Cr Earned |
|------|-----------|-----|---------|-----|------------|-------------|------------|---------------|
| Lewis R. Stern ☆ | 7685212 | U | ✓ | | | | | |
| Lynne Fletcher | 2958180 | U | ✓ | | | | | |
| Jack Francis | 3035280 | U | ✓ | | | | | |
| Margaret Olsen | 689226 | U | ✓ | | | | | |
| Mary Thompson | 905168 | U | ✓ | | | | | |
| Melissa Brown | 1052774 | U | ✓ | | | | | |
| Soligan, Andrea | 8534770 | G | ✓ | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| ☆ Received instructor's permission | | | | | | | | |

APPENDIX G

Sample Internal Add/Drop Form

SCHOOL OF EDUCATION

LEARNING EXPERIENCE ADD/DROP FORM

STUDENT NAME **FRANCIS   JACK**          STUDENT NO. 3035280

A D D                                    D R O P

| LEX NO. | LEX TITLE | MOD CR. | LEX NO. | LEX TITLE | MOD CR. |
|---------|-----------|---------|---------|-----------|---------|
| 1. 1815 | Racism + Class Bias | 100 | 1. 4250 | Teacher as Leader | 300 |
| 2. 4226 | Change + Use of Power | 25 | 2. | | |
| 3. 4220 | Leadership + Decisions | 135 | 3. | | |
| 4. 4475 | Educating the Senses | 40 | 4. | | |
| 5. 4565 | O. of Fuzzy Concepts | 40 | 5. | | |

INSTRUCTOR'S
INITIALS
(ADD)          1. ___  2. ___  3. ___  4. ___  5. ___

INSTRUCTOR'S
INITIALS
(DROP)         1. ___  2. L.S. ___  3. ___  4. W.S. ___  5. T.C. ___

APPENDIX H

Sample Internal Transcript

## SCHOOL OF EDUCATION TRANSCRIPT

PLEASE NOTE:    The information recorded on this transcript pertains only to those learning experiences credited at the School of Education. Transfer credits or credits awarded by other departments or schools within the University that may pertain to the discipline of education will be found on the regular University transcript.

EXPLANATIONS

LEX #    This is the School of Education internal number system. Each learning experience is assigned a specific number. These numbers serve as individual identification numbers.

CERTIFICATION    In an attempt to facilitate the certification process we have indicated for each learning experience the category that might be appropriate.

CENTER AND PROGRAM    Centers are administrative subdivisions within the School. Programs are subdivisions within a center. These codes indicate under whose auspices a particular learning experience is offered.

CREDIT    This system allows for the receipt of fractional credits. (1.50 equals one and a half credits, etc.)

LEVEL    Codes distinguish level of learning experience as follows: . U indicates undergraduate only; D indicates undergraduate and graduate; G or G7 indicates graduate only.

# AMHERST ELEMENTARY TEACHER PREPARATION PROGRAM
## DESCRIPTION

The Amherst Program is a three year program in which UMass undergraduates receive elementary teacher training in the Amherst Public Schools. The goals of the Program are as follows: (1) To train students in the many new techniques of teaching now used in the Amherst school system; (2) To expose students systematically to special education problems, to the philosophy of open education, to humanistic education, to health education, and to academic areas required for a Massachusetts Elementary Teaching Certificate; (3) To expose students to a greater variety of teaching and organizational styles than is usually provided in a teacher training program

The Amherst Program is carefully coordinated by codirectors from the School of Education and the Amherst School System to insure that the students progress logically and carefully in a sequential manner. The rationale for the Amherst Program is closely linked to the concept of sequential phases. Thus each phase is explained in the following sections.

Phase One: A student normally enters Phase 1 during the spring semester of his Freshman year or the fall semester of his Sophomore year. Phase I is a three credit course in the student's college program. The course consists of visits to Amherst and nearby elementary schools combined with introductory readings. Rather than processing information, this course will give students in small groups a chance to share perceptions from their visits to schools, parent-council meetings, school committee meetings, and from reading.

Phase Two: Phase II students work a minimum of five hours weekly as Apprentices in the Amherst Elementary Schools to fulfill the requirements of a six credit course as part of their college program. Although the Amherst School System will place and be responsible for Phase II students, School of Education and Amherst faculty involvement is maintained through small group discussions of the Apprentice's experiences. Specific responsibilities and amount of time spent in the classroom vary with individual arrangements. Students will have an opportunity for regular planned exposure to children.

Phase Three: In Phase III students take a minimum of six credits in a unique special education experience. This double course will consist of readings, lectures, and discussion in the area of special education and emotional needs for people of all ages. The course will also demand field placement in a community agency, working with mental health patients or in a special education setting. Students typically will spend portions of their time in both the academic and clinical areas, including roughly three to five hours weekly at their agency, class, or hospital.

Phase Four: Phase IV students will be taking courses and typically not experiencing field work during this semester. The Amherst Program believes in advising students carefully so that each may create an individual program of study. Each student in the program must take the responsibility of meeting certification requirements, but our plan is that with careful advising he should be able to cover other broad areas of study as well. By the end of Phase IV students will have covered the following academic areas:
    (1) Methods in language arts, mathematics, science, social studies.
    (2) Special Education (usually provided for in Phase III).
    (3) Exposure to music, art, and physical education.
    (4) Health education including human development, sex education, and nutrition as well as contemporary problems such as alcoholism and drug abuse.
    (5) Humanistic education, both philosophy and techniques.
    (6) Learning theory: knowledge of how students learn.
    (7) Racism: students will develop an understanding of both individual and institutional racism and the relationship to it as educators and citizens.

Phase Five: Students in Phase V take a full-time, semester-long internship in an Amherst elementary school. In the Amherst Program opportunities include experience in some or all of the following:
    (1) Planning and implementing individualized instruction programs
    (2) Maintaining and interpreting records of pupil's progress
    (3) Writing behavioral objectives and learning opportunities
    (4) Multi-media techniques and philosophy
    (5) multi-age grouping
    (6) team teaching
    (7) learning centers
    (8) non-graded organ.

Phase Six Study: In Phase VI, students will have completed all experiences in the Amherst Program. Phase VI is a semester for advanced work in an area of interest, a different type of field experience, or even part-time paid work as a teacher or an aide. It is also a time for reflection and for pursuing various interests in a liberal arts curriculum.

CERTIFICATION CATEGORY CODE

01 = Foundations (Historical, Philosophical, Social)

02 = Internship

03 = Methods and Curriculum

04 = Educational Psych.

05 = Psychological Foundations (Human Growth and Development)

06 = Other

07 = Other

08 = Other

09 = Other

11 = Graduate Level Foundations (Historical, Philosophical, Social)

12 = Graduate Level Internship

13 = Graduate Level Methods and Curric.

| NAME | JONES, JUDITH R. | STUDENT # 9103556 |
|---|---|---|
| HOME | 7665 WEST STREET SPRINGTOWN, MASS | SOCIAL SECURITY # 962 67 3467 |

| LEX # | CERTIFICATION | | | DESCRIPTIVE TITLE | CREDIT | LEVEL | GRADE |
|---|---|---|---|---|---|---|---|
| | CENTER | | | | | | |
| | | PROGRAM | | | | | |

ALL SCHOOL OF EDUCATION COURSE WORK COMPLETED
PRIOR TO SEPT. 1972 WILL BE FOUND ON UNIVER-
SITY TRANSCRIPT.

JONES, JUDITH, STUDENT # 9103556   FALL SEMESTER 1972

| LEX # | | | | DESCRIPTIVE TITLE | CREDIT | LEVEL | GRADE |
|---|---|---|---|---|---|---|---|
| 1910 | 05 | 22 | 01 | SCHOOLS, KIDS, AND THE SCHOOL OF ED. | 3.0 | U | P |
| 1915 | 03 | 22 | 20 | SPECIAL EDUCATION | 6.0 | U | P |
| 7110 | 01 | 02 | 00 | MIGRANT CHILD AND EDUCATION | 1.5 | D | P |

JONES, JUDITH R.   STUDENT # 9103556   SPRING SEMESTER 1973

| LEX # | | | | DESCRIPTIVE TITLE | CREDIT | LEVEL | GRADE |
|---|---|---|---|---|---|---|---|
| 7140 | 01 | 01 | 00 | PHILOSOPHY AND OPEN EDUCATION | 3.0 | D | P |
| 0315 | 05 | 04 | 00 | LANGUAGE DEV. IN EARLY CHILD. EDUC. | 1.0 | D | P |
| 4226 | 03 | 09 | 00 | CHANGE AND THE USE OF POWER IN SCHOOL | 0.25 | D | P |
| 4228 | 03 | 09 | 00 | CHANGE THROUGH BEHAVIOR MODIFICATION | 0.25 | D | P |
| 4230 | 03 | 09 | 00 | PLANNING AND IMPLEMENTING CHANGE | 0.25 | D | P |
| 4232 | 03 | 09 | 00 | CHANGE THEORY AS APPLIED TO SCHOOLS | 0.25 | D | P |
| 0025 | 03 | 01 | 00 | INTRO TO MULTIARTS FOR THE CLASSROOM | 2.00 | U | P |
| 3540 | 04 | 01 | 00 | CROSSCULTURAL IMP. OF LEARN. COMP.MOD. | 0.15 | D | P |

TOTAL EDUC. CREDITS BEFORE THIS SEMESTER   10.5   MAJOR: ELEM. EDUC.
TOTAL EDUC. CREDITS THIS SEMESTER          7.15   PROGRAM: 2220
TOTAL EDUC. CREDITS                        17.65   DEGREE: B.S.

APPENDIX I

Computer Program Specifications

93

# DATA ELEMENT DESCRIPTIONS

**File Name:** SCHOOL OF EDUCATION TRANSCRIPT FILE        **Record Name:**

| | DATA NAME | DESCRIPTION AND COMMENTS | DEFINITION |
|---|---|---|---|
| 1. | STUDNO | STUDENT NUMBER -- Unique student identification number. Numeric field. May be replaced by social security number. | x(9) |
| 2. | SOCSECNO | SOCIAL SECURITY NUMBER -- Numeric field. | x(9) |
| 3. | CTRTPC | CENTER AFFILIATION OR TPPC PROGRAM -- Unique code designating center or TPPC program in which student is currently enrolled. Education majors only. Numeric field. Consists of<br><br>(2x) Center -- Center in which student is enrolled.<br>(2x) TPPC Program -- Program (or program within center) in which student is enrolled.<br><br>See attached sheets | x(4) |
| 4. | MAJRCD | MAJOR -- Student's major - department | x(6) |
| 5. | DATECD | DATE (MONTH, YEAR) -- Indicates semester and year during which the block of learning experiences which follow took place and/or ended. Numeric field. Consists of<br><br>(2x) Month<br>(2x) Year | x(x) |

# DATA ELEMENT DESCRIPTIONS

**File Name:** SCHOOL OF EDUCATION TRANSCRIPT FILE    **Record Name:**

| | DATA NAME | DESCRIPTION AND COMMENTS | DEFINITION |
|---|---|---|---|
| 6. | CODENO | LEARNING EXPERIENCE NUMBER -- Unique number assigned to learning experience. Alphanumeric field. Consists of<br><br>(1x) Type - 0-2 undergraduates only<br>        3-6 graduates and undergraduates<br>        7-9 graduates only<br>        I   independent study<br><br>(3x) MODNO -- number of individual modular experience | n[x(4)] |
| 7. | LEVEL | LEVEL -- Indicates whether or not experience meets Graduate School "700 or above" course requirements. Also indicates to whom the experience is open: undergraduates, graduates, or both.<br><br>U  = Undergraduates only<br>D  = Double (undergraduates and graduate students)<br>G  = Graduate students only<br>     Does <u>not</u> meet 700 requirement<br>G7 = Graduate students only<br>     <u>Does</u> meet 700 requirement | x(2) |
| 8. | CENTCD | CENTER CODE OR TPPC PROGRAM CODE -- Indicates center or TPPC program which sponsored learning experience. Only primary code appears on transcript file. Consists of<br><br>(2x)  center<br>(2x)  TPPC program or TPPC program within center<br><br>See attached sheets | n[x(4)] |

# DATA ELEMENT DESCRIPTIONS

**File Name:** SCHOOL OF EDUCATION TRANSCRIPT FILE   **Record Name:**

| DATA NAME | DESCRIPTION AND COMMENTS | DEFINITION |
|---|---|---|
| 9. CERCAT | <u>CERTIFICATION CATEGORY</u> -- Indicates broad certification requirement area associated with learning experience numeric mode. Consists of<br><br>(1x) Level -- 0 - Undergraduate<br>           1 - Graduate<br><br>(1x) Certification area number<br><br><u>Codes</u><br><br>01 - Foundations<br>02 - Internship<br>03 - Methods and Curriculum<br>04 - Educational Psychology<br>05 - Psychological Foundations<br><br>11 - Graduate Level Foundations<br>12 - Graduate Level Internship<br>13 - Graduate Level Methods and Curric.<br>14 - Graduate Level Educ. Psych.<br>15 - Graduate Psych. Found.<br>16 - Graduate Level School Organization, Administration and Supervision<br>17 - Graduate Level Research and Evalua-tion<br>18 - Graduate Level Curric. Organization, Administration and Supervision<br>19 - Graduate Level Guidance and Counseling | n[x(2)] |
| 10. MODCRD | <u>MODULAR CREDITS</u> -- Number of modular credits achieved by student for learning experience. | n[x(4)] |
| 11. GRADE | <u>GRADE</u> achieved by student in learning experience. For most School of Education experiences grade will be pass or no record. However, for Master's candidates candidates letter grades (A, B, C, D) will be retained. | n[x(3)] |

3.

# DATA ELEMENT DESCRIPTIONS

**File Name:** SCHOOL OF EDUCATION TRANSCRIPT FILE    **Record Name:**

| | DATA NAME | DESCRIPTION AND COMMENTS | DEFINITION |
|---|---|---|---|
| 12. | TTOTCR | TOTAL CREDITS TO DATE -- Number of University credits student has accrued in School of Education experiences to date. (Retain two decimal places) | x(5) |
| NOTE: | | FIELDS 6 THROUGH 11 CAN BE REPEATED n TIMES | |
| 13. | STOTCR | TOTAL CREDITS THIS SEMESTER -- Number of University credits achieved this semester for School of Education experiences (two decimal places). | x(5) |
| 14. | TGRDCR | GRADED CREDITS TO DATE -- Total number of graded credits (Master's candidates only) student has accrued to date. (Two decimal places.) | x(5) |
| 15. | SGRDCR | GRADED CREDITS THIS SEMESTER -- Total number of graded credits (Master's candidates only) accrued this semester. (Two decimal places.) | x(5) |
| 16. | TGRADC | 700-LEVEL CREDITS TO DATE -- Total number of 700-level credits (for level = G7) accrued by student this semester. (Two decimal places.) | x(5) |
| 17. | SGRADC | 700-LEVEL CREDITS THIS SEMESTER -- Number of graduate level credits (for level = G7) accrued by student this semester. (Two decimal places.) | x(5) |
| 18. | REGCRD | REGISTERED CREDITS -- Total number of University credits registered for by student this semester. | x(5) |
| 19. | CRDBAL | CREDIT BALANCE -- Number of credits in excess of credits registered for by student this semester. | x(5) |

# DATA ELEMENT DESCRIPTIONS

**File Name:** SCHOOL OF EDUCATION TRANSCRIPT FILE          **Record Name:**

| | DATA NAME | DESCRIPTION AND COMMENTS | DEFINITION |
|---|---|---|---|
| 20. | HDRFLG | <u>HEADER FLAG</u> -- Indicates header label is required for new student record.<br><br>   0 or blank - no header label required<br>   1 - header label required | x(1) |
| 21. | LINECT | <u>LINE COUNTER</u> -- Count of number of individual learning experiences in transcript file. Updated at end of semester. | x(2) |
| | | | |

5.

# DATA ELEMENT DESCRIPTIONS

**File Name:** LEARNING EXPERIENCE FILE         **Record Name:**

| | DATA NAME | DESCRIPTION AND COMMENTS | DEFINITION |
|---|---|---|---|
| 1. | CODENO | <u>LEARNING EXPERIENCE NUMBER</u> -- Unique number assigned to learning experience. Alphanumeric field. Consists of<br><br>    (1x)   Type -<br>           0-2 Undergraduates only<br>           3-6 Graduates and undergraduates<br>           7-9 Graduates only<br>           I Independent study<br><br>    (3x)   MODNO -   Number of individual modular experience | $x(4)$ |
| 2. | PCODNO | <u>PARENT COURSE NUMBER</u> -- Traditional course which generated this learning experience. Numeric mode. | $x(7)$ |
| 3. | TOTFAC | <u>TOTAL FACULTY</u> -- Number of faculty members who offered learning experience. Numeric mode. | $x(1)$ |
| 4. | FACID | <u>FACULTY NUMBER</u> -- Social Security number of faculty member or graduate student who offered learning experience. This field and the next (FACLOAD) can be repeated three times. Numeric mode. | $3[x(9)]$ |
| 5. | FACLOAD | <u>FACULTY LOAD</u> -- Faculty member's contact hours for this learning experience. This field and the previous one (FACID) can be repeated three times. Numeric mode. | $3[x(4)]$ |

98

1.

# DATA ELEMENT DESCRIPTIONS

File Name: LEARNING EXPERIENCE FILE                Record Name:

| DATA NAME | DESCRIPTION AND COMMENTS | DEFINITION |
|-----------|--------------------------|------------|
| 6. LEVEL | <u>LEVEL</u> -- Indicates whether or not experience meets graduate school "700 or above" course requirements. Also indicates to whom the experience is open: undergraduates, graduates, or both.<br><br>U  = undergraduates only<br>D  = double (undergraduates and graduate students)<br>G  = graduate students only<br>     does <u>not</u> meet 700 requirement<br>G7 = graduate students only<br>     <u>does</u> meet 700 requirement | x(2) |
| 7. CENTCD | <u>CENTER CODE OR TPPC PROGRAM CODE</u> -- Indicates center or TPPC program which sponsored learning experience. Can be repeated three times if experience satisfies requirements of more than one center/program. Numeric mode. Consists of<br><br>(2x) Center – Center which sponsored experience<br>(2x) TPPC Program – Program (or program within center) which sponsored experience.<br><br>See attached sheets. | 3[x(4)] |

# DATA ELEMENT DESCRIPTIONS

**File Name:** LEARNING EXPERIENCE FILE     **Record Name:**

| | DATA NAME | DESCRIPTION AND COMMENTS | DEFINITION |
|---|---|---|---|
| 8. | CERCAT | <u>CERTIFICATION CATEGORY</u> -- Indicates broad certification requirement area. Numeric mode. Consists of<br><br>   (1x) Level -   0- Undergraduate<br>                 1- Graduate<br><br>   (1x) Certification area number<br><br>   <u>Codes</u><br><br>01 - Foundations<br>02 - Internship<br>03 - Methods and Curriculum<br>04 - Educational Psychology<br>05 - Psychological Foundations<br><br>11 - Graduate Level Foundations<br>12 - Graduate Level Internship<br>13 - Graduate Level Methods and Curric.<br>14 - Graduate Level Educ. Psych.<br>15 - Graduate Level Psych. Found.<br>16 - Graduate Level School Organization, Administration and Supervision<br>17 - Graduate Level Research and Evaluation<br>18 - Graduate Level Curric. Organization, Administration and Supervision<br>19 - Graduate Level Guidance and Counseling | x(2) |
| 9. | MODCRD | <u>MODULAR CREDITS</u> -- Number of modular credits assigned to learning experience. This can be either the exact number of credits or the maximum of a credit range. One University credit equals 100 modular credits. | x(4) |
| 10. | DATECD | <u>DATE (MONTH, YEAR)</u> -- Indicates semester and year during which learning experience took place and/or ended. Numeric mode. Consists of<br><br>   (2x) Month<br>   (2x) Year | x(4) |

# DATA ELEMENT DESCRIPTIONS

File Name: LEARNING EXPERIENCE FILE　　　　　Record Name:

| DATA NAME | DESCRIPTION AND COMMENTS | DEFINITION |
|---|---|---|
| 11. ENROLL | ENROLLMENT -- Final enrollment figures for learning experience. Updated after post-registration ends. Numeric field. Consists of<br><br>　(3x)　Capacity Figure ⎫<br>　(3x)　Final Count　　 ⎬　Undergraduates<br>　　　　　　　　　　　⎭<br><br>　(3x)　Capacity Figure ⎫<br>　(3x)　Final Count　　 ⎬　Graduates | x(12) |

4.

CENTCD (Center Code or TPPC Program Code)
and
CTRTPC (Center Affiliation or TPPC Program)

| Center Index Number | Center |
|---|---|
| 0100 | Aesthetics |
| 0200 | Foundations |
| 0300 | Higher Education |
| 0400 | Human Potential |
| 0500 | Human Relations |
| 0600 | Humanistic Education |
| 0700 | Innovations |
| 0800 | International Education |
| 0900 | Leadership and Educational Administration |
| 1000 | Media and Technology |
| 1100 | Research |
| 1200 | Teacher Education |
| 1300 | Urban Education |

Program

| | |
|---|---|
| 1400 | Advanced Studies |
| 1500 | Futuristics |
| 1600 | Instructional Applications of Computers |
| 1700 | Integrated Day |
| 1800 | Occupational Education |
| 1900 | Reading |
| 2000 | Bilingual/Bicultural |

Miscellaneous

| | |
|---|---|
| 2100 | Non-Center |
| 2200 | Teacher Preparation Programs |

The following TPPC programs, inasmuch as they fall under Teacher Preparation Programs, all have as first two numbers the same numbers as Teacher Preparation Program (which is 22) and the following third and fourth digits.

01   General Electives

### Elementary Programs

20   Amherst Elementary Program
21   METEP
22   Teacher Education at Mark's Meadow (TEPAM)

### Elementary and Secondary Programs

30   Alternative Schools (TASP)
31   Explorations!
32   Future Studies
33   International Education
34   Off-Campus
35   Off-Campus, Massachusetts
36   Reading Specialist
37   SHP Foundations
38   Urban Education

### Secondary Programs

50   Cooperative Education
51   Eleven-Plus Project
52   English for Prospective Secondary Teachers
53   Horizons
54   Math for Prospective Secondary Teachers
55   Omnibus
56   Science for Prospective Secondary Teachers
57   Social Studies for Prospective Secondary Teachers

### Non-Teaching Program

70   Media Specialists for the Deaf

### Other

80   Health Student Teaching
81   Spanish Student Teaching
82   Other Student Teaching

## Description of Flowcharts

The first two flowcharts provide a system overview. The first phase is the UPDATE CYCLE; the second is the END OF SEMESTER CYCLE.

UPDATE CYCLE

-- file input is from cards, however, cards could be generated from DIGITEK sheets as well as from a keypunch.

-- the first part of the cycle, Program A, updates the Learning Experience Master File. This file is indexed by Learning Experience Code Number (CODENO) and contains fields -- which completely describe the individual learning experience. This file exists on tape and a new tape is generated during the update process. The file is also put onto disk temporarily since it is subsequently used by the School of Education Transcript Master File update process.

-- the second part of the cycle, Program B, updates the School of Education Transcript Master File. This file is indexed by student number (STUDNO). It contains a minimum of pertinent statistical information (center affiliation, major, etc.), but most statistical information for transcript production is obtained by accessing the Student "STAT" file. It also contains a list of learning experiences and their descriptions indexed by semester and year (DATECD). In addition it contains a header flag (HDRFLG) which signals a header label is to be produced for a new record, and a line counter (LINECT) which is updated at the end of a semester to indicate the number of learning experiences completed by the student during that semester.

-- it is important to note that before an experience can be added to a student's transcript record, it must appear on the Learning Experience File. This is true for independent study experiences as well. Hence, the Learning Experience File must be updated before the School of Education Transcript File. Transaction errors for both Program A and Program B are noted on the system flowcharts.

## END OF SEMESTER CYCLE

-- at the end of the semester Program C operates on the School of
Education transcript Master File and prepares the file for
transcript production. All "TO DATE" fields and "THIS SEMESTER"
fields are updated and mods are converted to University credits.
Experiences are grouped according to certification area (CERCAT)
by the "RECORDER EXPERIENCES" subroutine. Special students who
pay per credit and who have accrued more credits than they
registered for are listed in a billing message produced by the
"ISSUE BILLING MESSAGE" subroutine.

-- Program D produces the labels which are affixed to the student's
School of Education transcript. If it is the first time a transcript
has been issued for a student the header flag (HDRFLG) will
indicate a header label is to be produced. Learning experiences
will be listed for the semester on a separate label. If the line
counter (LINECT) indicates that there are more experiences than
can fit on one label, a second learning experience label will be
generated. The maximum number of experiences per label is
currently set at ten, but this could be easily changed if more
or fewer experiences can fit on the label or if the label has to
be redesigned.

## PROGRAM A (PRGRMA)

This set of flowcharts describes in detail the procedure necessary to update
the Learning Experience Master File. Input is from cards. The card layout
has not been designed, but if it is an initial entry for the learning
experience (in contrast to a change of a previously entered experience), certain
critical fields should appear on the card. These include: CODENO, FACID,
CERCAT, DATECD, DESCRP, MODCRD, CENTCD (see file description for
explanation of mnemonics). The card layout design should provide for all
these fields. In addition, should a change to a previously entered experience
be required, the card should contain a "change" field (CHANGECD). This
would allow mistakes to be corrected or individual fields to be updated. The
design described by this set of flowcharts provides for a scan of the card to
determine the field to be changed by its position on the card. But, in
retrospect, this seems awkward and a better way would be to assign a specific
numeric or alphabetic code for each individual field change.

Transaction errors include

-- critical field missing
-- duplicate learning experience

## PROGRAM B (PRGRMB)

This set of flowcharts describes in detail the procedure necessary to
update the School of Education Transcript Master File. Input is from cards. The
card layout has not been designed, but it should include for an initial
entry: STUDNO, CTRTPC, MAJRCD, REGCRD (see School of Education Transcript File

for explanation of mnemonics). Subsequent entries could simply contain: STUDNO, DATECD, CODENO, MODCRD, and GRADE. Card should also provide a field for "change" transactions (CHNGCD) to correct errors, etc. CHNGCD could be assigned a code for changes to each individual field as described in PROGRAM A.

PROGRAM B utilizes the updated Learning Experience File on disk as well as the old School of Education Transcript Master File on tape. A new updated tape version of the latter is produced by PROGRAM B.

Transaction errors include

-- student not registered or paid
-- no record for student in "STAT" file
-- learning experience not in master file
-- critical information missing


## PROGRAM C (PRGRMC)

This set of flowcharts describes in detail the procedure necessary to prepare the School of Education Transcript Master File for end-of-semester transcript production. On page 1CE3, block says to "reference this semester and year (DATECD)". An additional check should be made for a _previous_ semester and year so that all "to date" fields can be moved to _current_ semester and year. Ptherwise, "TO DATE" fields (TTOTCR, TGRDCR, TGRADC) should be initialized to zero.

Besides updating "TO DATE" fields and "THIS SEMESTER" fields program also provides for regrouping of experiences according to certification category. This is to be done by a subroutine which unfortunately has not been flowcharted. Since time was an important factor and since the subroutine will be merely a simple "SORT" on certification area for which codes are provided, I left the mechanics of the "SORT" up to the programmer's discretion.

This program also converts mods to University credits using the formula 1 University credit equaly 100 mods.

In addition it seemed likely that because of "post-registration" in the School of Education a student may exceed (or fall short of) the number of credits he initially registered for at the beginning of the semester with the University. If he is a special student of any variety and is in the credit range (below 10 credits) where he pays by credit it may be necessary to issue him a bill. To provide for this a call is given to an "ISSUE BILLING MESSAGE" sub-routine. This is not flowcharted because

-- I did not know how may different "special" student categories
   pay by credit

-- I did not know how much and what kind of information would be required
   by the bursar's office.

If such a message is desired by the bursar's office it should be a relatively simple task to design this subroutine.

PROGRAM D (PRGRMD)

This set of flowcharts describes in detail the procedure necessary to produce header labels and learning experience labels for the student's School of Education transcript. The header flag's (HDRFLG) being "on" (= 1) triggers production of the header label for a new student transcript. Learning experiences, credits "TO DATE" and "THIS SEMESTER," registered credits, credit balance, student's major and center affiliation are generated on the learning experience label. At present the system defines a maximum of ten learning experiences per label. This is subject to change if it is incorrect. A line counter (LINECT) in the transcript file keeps track of the number of learning experiences and if these total more than ten a second label is produced. Each learning experience label is identified by a line entry of student name and student number as on present University transcript labels.

IBM Flowcharting Worksheet

Programmer: _PATRICIA C. MITCHELL_ Program No.:_____ Date:_____ Page:_____
Chart ID:____ Chart Name:_____ Program Name: _UPDATE CYCLE_

## UPDATE CYCLE

## END OF SEMESTER CYCLE

SCHOOL OF ED. TRANSCRIPT MASTER FILE

STUDENT 'STAT' FILE (ON LINE)

PROGRAM C
- CONVERT MODS TO UNIV. CREDITS
- UPDATE VARIABLE CREDIT FIELDS
- REORDER EXPERIENCES ACCORDING TO CENTER (SUBROUTINE)
- ISSUE BILLING MESSAGE (SUBROUTINE)

CERTIFICATION AREA

UPDATED SCHOOL OF ED. TRANSCRIPT MASTER FILE

BILLING MESSAGE
INFO. ON SPECIAL STUDENTS WHO PAY BY CREDIT + WHO OWE MONEY

SCHOOL OF ED TRANSCRIPT MASTER FILE

STUDENT 'STAT' FILE

PROGRAM D
PRINT SCHOOL OF ED TRANSCRIPT LABELS

HEADER LABELS FOR NEW RECORDS

LABELS FOR LEARNING EXPERIENCES THIS SEMESTER

Fold under at dotted line.

Fold under at dotted line.

Programmer: _PATRICIA C. MITCHELL_    Program No.: _____    Date: _____    Page: _1A_
Chart ID: ____ Chart Name: _____    Program Name: _PRGPMA_

(UPDATE LEARNING EXPERIENCE MASTER FILE)

REFERENCE
LEARNING EXPERIENCE MASTER FILE
DESCRIPTION

START

LOAD LEARNING EXPERIENCE MASTER FILE

OLD LEARNING EXPERIENCE MASTER FILE

FROM 2AJ3 3AJ3

1A C3

READ A CARD

NEW LEARNING EXPERIENCE MASTER FILE

CREATE NEW TAPE MASTER FILE & NEW UPDATED MASTER FILE ON DISK.

YES

LAST CARD ?

NO

LEARNING EXPERIENCE MASTER FILE ON DISK

GET CODE NUMBER OF LEARNING EXPERIENCE FROM CARD.    CODENO

NEW LEARNING EXPERIENCE MASTER FILE

REFERENCE LEARNING EXPERIENCE MASTER FILE    CODENO

RELEASE TAPE FILES

DOES CODE NO. APPEAR IN MASTER FILE ?    CODENO = CODENO    YES    3A A3

NO

OLD LEARNING EXPERIENCE MASTER FILE

IS THIS AN INDEPENDENT STUDY EXPERIENCE ?    CODENO = 'Ixxx' (WHERE X'S ARE DIGITS)    YES    EXAMINE CARD TO DETERMINE IF ANY CRITICAL FIELDS MISSING    CODENO FACID CERCAT DATECD DESCRP MODCRD CENTCD LEVEL

NO

END

EXAMINE CARD TO DETERMINE IF ANY CRITICAL FIELDS MISSING    CODENO FACID FACLOD CERCAT DATECD DESCRP MODCRD CENTCD LEVEL

3A A3

IBM Flowcharting Worksheet

Programmer: _____ Program No.: _____ Date: _____ Page: 2٨

Chart ID: _____ Chart Name: _____ Program Name: _____

FROM
1AK3

2A
A3

CODENO
DESCRP

'PROGRAM INFORMATION
(CRITICAL FIELD) MISSING'

PRINT
ERROR
MESSAGE

◁— YES — CRITICAL
FIELD
MISSING
?

NO

J3

REFERENCE
LEARNING
EXPERIENCE
MASTER FILE          CODENO

SEQUENCE
CHECK CODE NO.
ON CARD AGAINST
MASTER FILE          CODENO

CREATE NEW
MASTER FILE
RECORD IN
APPROPRIATE
SEQUENTIAL
POSITION          CODENO
CRITICAL FIELDS

J3

1A
C3

FROM
1A64    3A
        03

EXAMINE
CHANGE CODE        CHNGCD
FIELD ON
CARD

REFERENCE
RECORD IN          CODENO
LEARNING
EXPERIENCE
MASTER FIELD

IS
THIS A              CHNGCD ≠
LEGITIMATE   NO     BLANKS
CHANGE
?

YES

CODENO
DESCRP
'DUPLICATE          PRINT
LEARNING            ERROR
EXPERIENCE'         MESSAGE

J3

DETERMINE          field ≠ BLANKS
FIELD TO BE        (POSITION OF
CHANGED            FIELD ON CARD
                   INDICATES FIELD
                   NAME)

REPLACE FIELD
ON MASTER
FILE RECORD

              next field ≠ BLANKS
YES    ANOTHER
       FIELD TO BE
       CHANGED
       ?

J3

J3

1A
03

# IBM Flowcharting Worksheet

PRINTED IN U.S.A
#20 8091 2 U M/PAD

Programmer: _PATRICIA C. MITCHELL_   Program No.: _____   Date: _____   Page: _1B_

Chart ID: ___   Chart Name: _____

Program Name: _PRGPMB_

(UPDATE SCHOOL OF ED. TRANSCRIPT MASTER FILE)

_REFERENCE_
_SCHOOL OF EDUCATION_
_TRANSCRIPT MASTER FILE_
_DESCRIPTION_

UPDATED LEARNING EXPERIENCE MASTER FILE CREATED BY _PGRMA_ STILL RETAINED ON LINE ON DISK FOR REFERENCE BY _PRGPMB_

START
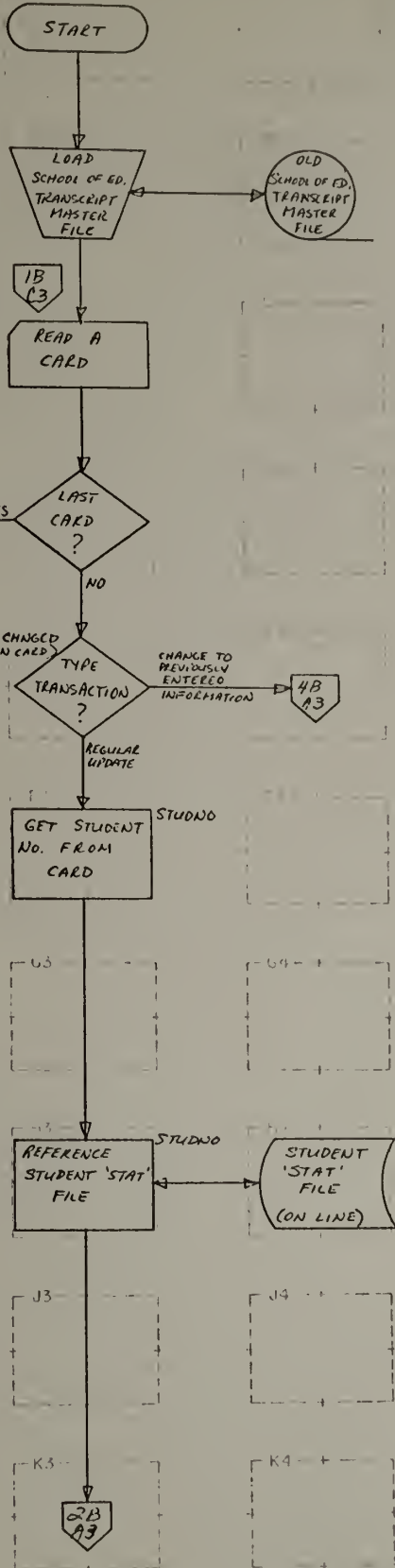
LOAD SCHOOL OF ED. TRANSCRIPT MASTER FILE

OLD SCHOOL OF ED. TRANSCRIPT MASTER FILE

FROM
2BG4
3BH3
4BK3

1B C3

READ A CARD

NEW UPDATED SCHOOL OF ED TRANSCRIPT MASTER FILE

CREATE NEW TAPE MASTER FILE

YES

LAST CARD ?

NO

CHNGED (ON CARD)

TYPE TRANSACTION ?

CHANGE TO PREVIOUSLY ENTERED INFORMATION

4B A3

REGULAR UPDATE

OLD SCHOOL OF ED. TRANSCRIPT MASTER FILE

GET STUDENT NO. FROM CARD

STUDNO

NEW SCHOOL OF ED. TRANSCRIPT MASTER FILE

RELEASE FILES

LEARNING EXPERIENCE MASTER FILE ON DISK

REFERENCE STUDENT 'STAT' FILE

STUDNO

STUDENT 'STAT' FILE (ON LINE)

END

2B A3

Programmer: _____  Program No.: _____  Date: _____ Page: _2B_

Chart ID: _____ Chart Name: _____

Program Name: _____

FROM
1BK3

2B
H3

IS
STUDENT NO.
IN 'STAT' FILE
?  — STUDNO

NO →  PRINT
ERROR
MESSAGE
→ STUDENT NUMBER
STUDENT NAME
'NO RECORD IN
'STAT' FILE'

YES ↓

G4

HAS
STUDENT
REGISTERED
?  — 'STAT' FILE
REGISTRATION
CODE

NO →  PRINT
ERROR
MESSAGE
→ STUDENT NUMBER
STUDENT NAME
'STUDENT HAS
NOT REGISTERED'

G4

YES ↓

HAS
STUDENT
PAID
?  — 'STAT' FILE
PAY CODE

NO →  PRINT
ERROR
MESSAGE
→ STUDENT NUMBER
STUDENT NAME
'STUDENT HAS
NOT PAID'

G4

1B
C3

YES ↓

GET LEARNING
EXPERIENCE
INFORMATION
FROM CARD  — CODENO
MODCRD
GRADE
:

LEARNING
EXPERIENCE
MASTER FILE
ON DISK
← REFERENCE
LEARNING
EXPERIENCE
MASTER FILE  — CODENO

3B
H3

Fold under at dotted line.

Fold under at dotted line.

```
                                          ┌────┐
                                          │ 4B │
                                          │ A3 │
                                          └──┬─┘
                                             │
                              ┌──────────────┴──┐        STUDNO
                              │ GET CHANGE      │        DATECD
                              │ INFORMATION     │
                              │ FROM CARD       │
                              └──────────────┬──┘
                                             │
                              ┌──────────────┴──┐
                              │ REFERENCE       │
                              │ RECORD & FIELD  │
                              │ IN SCHOOL OF ED.│
                              │ TRANSCRIPT      │
                              │ MASTER FILE     │
                              └──────────────┬──┘
                                             │
                              ┌──────────────┴──┐        field ≠ BLANKS
                              │ DETERMINE       │
                              │ FIELD TO BE     │
                              │ CHANGED         │
                              │ FROM CARD       │
                              └──────────────┬──┘
                                             │
                                          ( E3 )
                                             │          'NEW' CODENO field  ┐
                                             ◇          'OLD' CODENO field  ┘ ≠ BLANKS
  ┌──────────────┐    'OLD'            IS
  │ REFERENCE    │    CODENO      FIELD TO BE
  │ OLD CODE     │◄──── YES ──── CHANGED LEARNING
  │ NUMBER FIELD │               EXPERIENCE
  │ ON MASTER FILE│               CODE NO.
  └──────┬───────┘                    ◇
         │                            │ NO
         │                            │
  ┌──────┴───────┐    'OLD' CODENO    ◇
  │ REPLACE OLD  │    'NEW' CODENO   IS
  │ CODE NO. WITH │              FIELD
  │ NEW CODE NO. │             REFERENCED
  └──────┬───────┘             BY LEARNING ──── NO ──────┐
         │                     EXPERIENCE                │   (CERTAC
         │                     CODE?                     │    MAJRCD
         │                        ◇                      │    OR
         │                        │ YES                  │    RECCRD)
         │                        │ (MODCRD              │
         │                        │  or                  │
         │                        │  GRADE)              │
         │             ┌──────────┴──┐                   │
         │             │ REFERENCE   │                   │
         │             │ FIELD BY    │                   │
         │             │ CODE NUMBER │                   │
         │             └──────────┬──┘                   │
         │                        │                      │
         │             ┌──────────┴──┐                   │
         └────────────►│ REPLACE     │◄──────────────────┘
                       │ FIELD ON    │
                       │ MASTER FILE │
                       │ RECORD      │
                       └──────────┬──┘
                                  │
                                  ◇
                             ANOTHER
                            FIELD TO BE ──── ( E3 )
                             CHANGED
                                ?
                                  │
                               ┌──┴─┐
                               │ 1B │
                               │ C3 │
                               └────┘
```

(PREPARE SCHOOL OF ED TRANSCRIPT MASTER FILE
FOR TRANSCRIPT PRODUCTION)

START

LOAD SCHOOL OF E.D. TRANSCRIPT MASTER FILE → SCHOOL OF ED TRANSCRIPT MASTER FILE

REFERENCE FIRST STUDENT NUMBER ON TRANSCRIPT FILE    STUDNO

FROM 3C62    1C D3

GRADFG = D (DOCTORAL CAND)
" M (MASTERS CAND.)

CLASS = 6D 6M

SET PROGRAM FLAG TO INDICATE DEGREE PROGRAM    ← YES ← GRADUATE STUDENT ? ← REFERENCE STUDENT 'STAT' FILE    STUDNO ← STUDENT 'STAT' FILE

NO

E3

SPECIAL STUDENT or TRANSIENT GRAD ?    CLASS = SP GX → REFERENCE THIS SEMESTER & YEAR ON TRANSCRIPT FILE    DATECD

SPECFG = S

SET PROGRAM FLAG TO INDICATE SPECIAL STUDENT

GET 'TO DATE' INFORMATION AND NUMBER OF REGISTERED CREDITS    TTOTCR TGRDCR TGRADC REGCRD

E3

REFERENCE FIRST LEARNING EXPERIENCE    CODENO

CERCAT
CERICB(TRMTRAT)

CALL 'SORT EXPERIENCES' SUBROUTINE

2C A3

Programmer: _____ Program No.: _____ Date: _____ Page: 2C

Chart ID: _____ Chart Name: _____ Program Name: PLCRMC

FROM
1CK3

2C
A3

ZERO OUT
PROGRAM
ACCUMULATORS          ACCTOT
                     ACCCRD
                     ACCGRAD

INITIALIZE
LINE COUNT FIELD     LINECT
IN TRANSCRIPT        = 1        REFERENCE     CODENO
MASTER FILE                     FIRST
TO 1                            LEARNING
                                EXPERIENCE

D3

GET NUMBER           MODCRD        ADD NO. OF           MODCRD + ACCTOT
OF MODS AND          GRADE         MODS TO
GRADE ACHIEVED                     TOTALS
                                   ACCUMULATOR

                    CODENO = I***        LEVEL = G7
                                         CODENO = 9000+
G3          NO    INDEPENDENT    NO    IS
                  STUDY                THIS A
                  EXPERIENCE           7CC LEVEL
                  ?                    'GRAD-ONLY'
                                       EXPERIENCE
                                       ?

                  YES                  YES

              GRADFG = D OR
              M
          GRADUATE      YES    ADD NO OF MODS     MODCRD
          STUDENT              TO ACCUMULATOR     +
          ?                    FOR GRADUATE       ACCGRAD
                               CREDITS

          NO

                    G3           GRADFG = M              GRADE = A
                          G                                      B
                          STUDENT                               C
                          A MASTER'S   YES    IS              D
                          CANDIDATE           EXPERIENCE    YES    ADD NO. OF MODS    MODCRD
                          ?                   GRADED                TO ACCUMULATOR    +
                                              ?                     FOR GRADED       ACCCRD
                                                                    CREDITS

                          NO

                    H3                                                          H3

                    ANOTHER          CODENO
                    LEARNING         NO       3C
                    EXPERIENCE                A3
                    ?

                    YES

ADD 1 TO         LINECT =      REFERENCE      CODENO
LINE COUNT IN    LINECT + 1    NEXT
TRANSCRIPT                     LEARNING
MASTER FILE                    EXPERIENCE

D3

FROM
2CH4

3C
A3

CONVERT NO. OF
MODS TO UNIV.
CREDITS
(1 UNIV. CREDIT =
100 MODS)

ACCTOT/100
ACCCRD/100
ACCGRAD/100

MOVE ACCUMULATED
TOTALS TO
'THIS SEMESTER'
FIELDS

ACCTOT → STOTCR
ACCCRD → SGRDCR
ACCGRAD → SGRADC

REGCRD - STOTCR

STORE
DIFFERENCE IN
CREDIT BALANCE
FIELD IN
TRANSCRIPT FILE

CRDBAL

SUBTRACT
TOTAL CREDITS
THIS SEMESTER
FROM REGISTERED
CREDITS

ADD ACCUMULATED
TOTALS TO
'TO DATE'
FIELDS

ACCTOT + TTOTCR
ACCCRD + TGRDCR
ACCGRAD + TGRADC

CRDBAL = NEG.

IS
BALANCE
NEGATIVE
?

YES

SPECFG = S

IS
THIS A
SPECIAL
STUDENT
?

YES

CALL
'ISSUE BILLING
MESSAGE'
SUBROUTINE

NO

NO

REFERENCE
NEXT STUDENT
NO. IN
TRANSCRIPT FILE

STUDNO

1C
D3

YES

ANOTHER
STUDENT
IN FILE
?

NO

REWIND
TRANSCRIPT
FILE

UPDATED
SCHOOL OF ED
TRANSCRIPT
MASTER
FILE

END

Programmer: _PATRICIA C. MITCHELL_   Program No.: _____   Date: _____   Page: _1D_
Chart ID: ____ Chart Name: _____   Program Name: _PEGPMD_

START

REFERENCE SCHOOL OF ED. TRANSCRIPT MASTER FILE → STUDNO → SCHOOL OF ED. TRANSCRIPT MASTER FILE

FROM 3DF4
1D C3

IS HEADER FLAG EQUAL TO ONE ? — HDRFLG = 1 (TRANSCRIPT FILE)

NO

REFERENCE STUDENT 'STAT' FILE → STUDNO → STUDENT 'STAT' FILE

YES

GET HEADER FIELDS → STUDNO, STUDENT NAME, CLASS/DEGREE PROGRAM, HOME ADDRESS, FIRST ENROLLMENT, SEX → PRINT HEADER LABEL → HEADER LABEL: STUD NO., STUD NAME, CLASS/DEGREE PROG, HOME ADDRESS, FIRST ENROLLMENT, SEX

PRINT FIRST LINE OF LEARNING EXPERIENCE LABEL → LEARN. EXP. LABEL: LINE 1 = STUD NO. STUD. NAME

REFERENCE APPROPRIATE SEMESTER & YEAR IN TRANSCRIPT FILE — DATE CD

LEARN. EXP. LABEL: LINE 2 = SEMESTER - YEAR ← PRINT SECOND LINE WITH SEMESTER/YEAR INFORMATION

EXAMINE LINE COUNT FIELD IN TRANSCRIPT FILE — LINECT

2D A3

Programmer: _____  Program No.: _____  Date: _____  Page: 2D
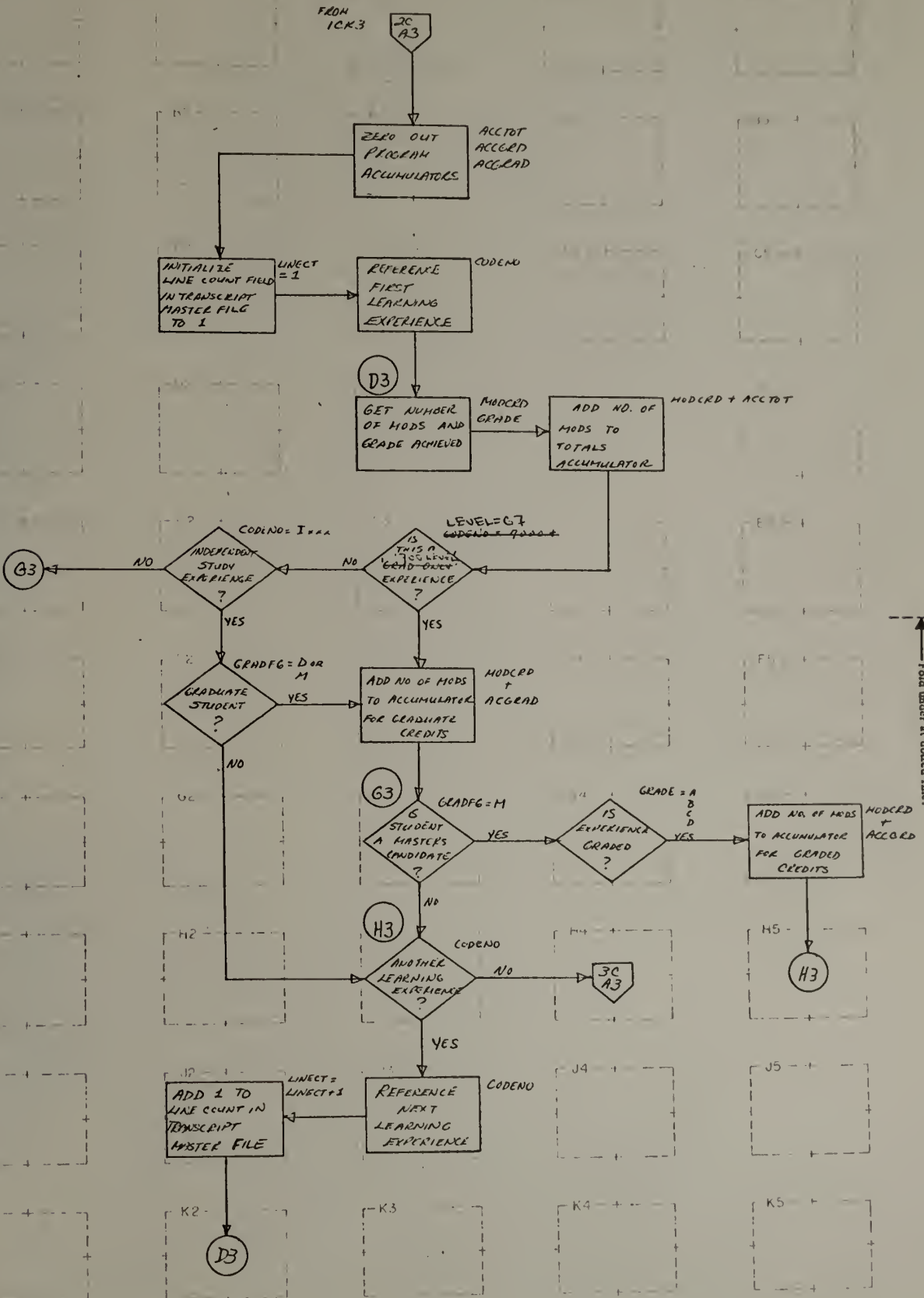
Chart ID: _____ Chart Name: _____  Program Name: PRGPMD

FROM
IDK3

2D
A3

LINECT > 10 LEARNING EXPERIENCES

OVER MAXIMUM FOR SINGLE LABEL ?  — YES → SET PROGRAM INDICATOE TO SHOW SECOND LABEL NEEDED  LABEL2 = 1

NO

CODENO

REFERENCE FIRST LEARNING EXPERIENCE ← INITIATE PROGRAM LINE COUNTER  PLINCT = 0

D3

LEARN. EXP LABEL
LINE ENTRY:
CODENO  DESCRP
LEVEL  CENTCD
CERCAT  MODCRD
GRADE

LEFTMOST DIGIT OF CODENO FIELD INDICATES LEVEL (SEE LEARNING EXPERIENCE FILE DESCRIPTION)

PRINT LINE FOR THIS LEARNING EXPERIENCE

CODENO
DESCPP
CENTCD
CERCAT
MODCRD
GRADE
LEVEL

PLINCT = PLINCT + 1

ADD ONE TO PROGRAM LINE COUNTER. ← YES — SECOND LABEL NEEDED ?  LABEL2 = 2

E4

TURN OFF SECOND LABEL INDICATOR  LABEL2 = 0

NO

PLINCT < 10

IS PROGRAM LINE COUNTER LESS THAN 10 ? — YES → ANOTHER LEARNING EXPERIENCE ?  CODENO → REFERENCE NEXT LEARNING EXPERIENCE  CODENO → D3

NO

NO

REFERENCE SECOND LABEL

PRINT STUDENT'S MAJOR ← MAJRCD — LEARN EXP LABEL LINE ENTRY 'MAJOR = xxxx'

LEARN EXP LABEL 1
LAST LINE ENTRY 'CONTINUE'S

PRINT 'CONTINUE' ON LAST LINE OF FIRST LABEL

H3
IS STUDENTS MAJOR EDUCATION ?  MAJRCD = 'EDUC' — NO → K3

YES

LEARN EXP LABEL2
LINE 1 = STUD. NO
STUD. NAME

PRINT FIRST LINE OF SECOND LABEL  STUDNO STUDENT NAME

PRINT STUDENT'S CENTER OF TPPC PROGRAM FROM TRANSCRIPT FILE  CTRTPC ← LEARN EXP LABEL LINE ENTRY 'CENTER = xxxxx' OR 'TPPC PRC = xxxx'

K1

K2
E4

K3
3D
A3

K4

K5

FROM
2DK3

3D
A3

PRINT
CREDIT
HEADINGS

LEARN. EXP. LABEL
CREDIT
HEADINGS

| | | TOTAL CREDITS | GRADED CREDITS | 900C LEVEL CREDITS | RECEIVED CREDIT | CREDIT BALAN |
|---|---|---|---|---|---|---|
| TO DATE | X | X | X | X | | |
| THIS SEMESTER | X | X | X | X | X | X |

TTOTCR
STOTCR
TGRDCR
SGRDCR
TGRADC
SGRADC
REGCRD
CRDBAL

PRINT
CREDIT
VALUES

LEARN. EXP. LABEL
CREDIT
VALUES

INSERT
CREDIT VALUES
INTO 'X' POSITIONS
DESCRIBED ABOVE

REFERENCE
NEXT STUDENT
NUMBER IN
TRANSCRIPT FILE

STUDNO

ANOTHER
STUDENT
?

YES → 1D C3

NO

RELEASE
TAPE
FILE

School of ED
TRANSCRIPT
MASTER
FILE

END

# BIBLIOGRAPHY

Allen, Dwight W. and Christensen, Philip R. "Using Time, Space, and People More Effectively." Controversy in Education. Philadelphia: W. B. Saunders Company, in press.

Ausubel, David P. Educational Psychology: A Cognitive View. New York: Holt, Rinehart, and Winston, Inc., 1968.

Biehler, Robert R. Psychology Applied to Teaching. Boston: Houghton Mifflin Company, 1971.

Bruner, Jerome S. Toward a Theory of Instruction. Cambridge: Harvard University Press, 1966.

Bugelski, B. R. The Psychology of Learning Applied to Teaching. Indianapolis: Bobbs-Merrill, 1964.

The Committee on Utilization of College Teaching Resources. Better Utilization of College Teaching Resources, A Summary Report. New York: The Fund for the Advancement of Education, 1959.

Counts, George S. The American Road to Culture. New York: The John Day Company, 1930.

Gagné, Robert M. The Conditions of Learning. New York: Holt, Rinehart, and Winston, Inc., 1965.

Gerhard, Dietrich. "The Emergence of the Credit System in American Education Considered as a Problem of Social and Intellectual History." American Association of University Professors Bulletin, 41 (1955), 647-668.

Gleason, Gerald R., ed. The Theory and Nature of Independent Learning. Scranton: International Textbook Company, 1967.

Grose, Robert F. "How Long is a Credit? When Is a Course?" College and University, 46 (Fall, 1970), 20-32.

Jordan, Daniel C. "Learning Competence and the Release of Human Potential." ANISA Working Paper No. 25, School of Education, University of Massachusetts, 1971 (unpublished).

Kuethe, James L. The Teaching-Learning Process. Atlanta: Scott, Foresman and Company, 1968.

Lewis, Lanora A.  The Credit System in Colleges and Universities.
New Dimensions in Higher Education, No. 9.  Washington:
U. S. Government Printing Office, 1961.

National Center for Educational Statistics.  Student Personnel Terms
in Higher Education.  Washington:  U. S. Government Printing
Office, 1968.

Rogers, Carl B.  Freedom to Learn.  Columbus:  Charles E. Merrill
Publishing Company, 1919.

Snow, Richard E.  "Research on Media and Aptitudes."  Viewpoints,
Bulletin of the School of Education, Indiana University,
46 (September 1970), 63-89.

Snygg, Donald.  "Learning:  An Aspect of Personality Development."
Learning Theory, Personality Theory, and Clinical Research.
New York:  Wiley, 1954.

Stones, E.  Learning and Teaching:  A Programmed Introduction.  New York:
Wiley, 1968.

Theobald, Robert.  An Alternative Future for America II.  Chicago:
Swallow Press, 1970.

Veblen, Thorstein.  The Higher Learning in America.  New York:
A. M. Kelley, 1918.