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A STRATEGY FOR CURRICULUM REFORM*

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A strategy for the development of curriculum change in a Faculty of Agriculture is outlined The strategy followed that proposed by Tyler It involved virtually all teaching members of the faculty who through study, symposia and task forces examined objectives to be pursued, learning experiences to be provided, the organization of those experiences and the evaluation of the curriculum Difficulties encountered in the approach are discussed

Effecting changes in curricula has proven to be no easy undertaking, as witness the recent massive efforts in the United States One approach in attempting to effect change is to involve those who have to implement the change in such a manner that they are an integral part of the designing process An effort to redesign the curriculum of the Faculty of Agriculture of University College, Dublin, involving the entire staff, is in progress The strategy being followed is based on a curriculum rationale developed by Ralph W Tyler and is designed to facilitate members of the staff in learning their way through the process This paper elaborates upon the rationale, the strategy and something of the consequences of the five-year project to date The ideas may have relevance to a range of educational circumstances where curriculum design is a concern

The typical approach to curriculum reform within an educational system is to appoint a committee Those appointed to the committee are people considered to be competent to make the judgments necessary to improve the existing situation On a more global basis, when a crisis arises (as was judged to be the case in the United States in the early 1960s, coincident with Russia's demonstrated technological advances), specialists busy themselves to redefine what the content of curricula should be In the case of the United States, some of the most competent subject specialists in the nation marshalled their efforts into massive projects to redefine the content of curricula, especially in the sciences and technologies In some cases scholars considered competent in the subject of curriculum design and learning were brought in Nevertheless, the work, in general, was undertaken by committees (or task forces)

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Neither the curriculum committee selected from within a particular educational system nor the massive curriculum project approach has been overwhelmingly successful in effecting change For example, study tours to a range of other third-level institutions offering degrees in agriculture have recently been undertaken by the staff of the Faculty of Agriculture, University College, Dublin The observations of these study teams underline the problems inherent in the curriculum committee approach These study teams (five four-man teams) visited fifteen institutions in the United States, two in Canada, seven in Britain and five on the continent Most of the institutions had been recently or were currently engaged in substantial curriculum reform Typically, they relied on an overall committee of staff to study the existing situation, its problems, seek out possibilities for improvement, and make recommendations In time their recommendations were accepted However, their recommendations often were modified through faculty argumentation, debate and compromise Going from one institution to another it was possible to observe the kind of changes being made In some cases the structure being abandoned by one was being adopted and implemented by another

The main problems with the two systems of curricular reform mentioned above appear to reside in the ability of the teacher, who is to use the new materials, to operate in the new system

THE PROBLEM

The problem is one of effecting curriculum change—not just one of deciding what change *should* be made or of what different types of curricular materials would be desirable Effecting change proves to be no easy undertaking With the necessary resources it is not difficult to find people who will conduct research to determine where the problems are, what changes could be made how well or poorly students are doing under varied and controlled conditions, and the like However, when an attempt is made to assemble examples of efforts to actually bring about change in a system, the response is less than overwhelming Such an attempt was recently made by the journal, *Curriculum Theory Network* (Monograph Supplement CTN7, 1971) What they got, however for the most part was a collection of articles reporting research and evaluative studies that had been conducted relating to curricular problems

Accumulating evidence suggests that in order to effect curricular change, those who are to implement the change must not only comprehend what the changes are all about and why they are necessary, but also how they can be implemented and what problems and consequences should be anticipated (2) Often the thinking process that was used by those who designed the new curriculum is unreported, unobservable, and undetectable (4)

How can all those who are to be involved in implementing curriculum reform participate in the redesign? This is an especially complex question when it is remembered that the typical teacher most likely has had no study or experience with comprehensive curriculum development Equally important is the question of how to manage a curriculum development effort Even in the simplest school systems, an attempt to bring about a comprehensive curriculum change can become a fairly complex undertaking

The purpose of this paper is to illustrate a strategy that was developed for a university department with a staff of about 50 members It was formulated to guide them through a curriculum design/development project The staff of the Faculty of Agriculture at University College, Dublin had recognized a number of problems with their existing curriculum (agriculture will be used to refer not only to general agriculture but forestry and horticulture as well) Among the problems were (i) Overcrowded timetables students were complaining that they had so much contact time scheduled with staff that they had no time for individual study and reflection (ii) With so much crowded into the timetable, students tended to memorize materials and regurgitate it at examinations (iii) Rapidly changing circumstances in the agricultural industry suggested that the preparation of graduates to cope with these changes deserved critical examination (iv) Anticipated changing employment opportunities suggested a reappraisal of what the graduate was preparing to do as a career professional (v) The College was in the midst of designing new facilities How could they be reasonably confident that what they would design would meet their possibly changing requirements? (vi) It was observed that on reaching their third or fourth year, students were required to rely on things they were expected to have learned in their first or second year However, students reported that even though the materials may have been covered during their first or second year courses they had long since been forgotten

When these problems first began to surface they were not clearly

focused However, there was enough unrest with the existing situation to prompt the staff to initiate some explorations into opportunities for improvement In this exploratory process it became evident that a fairly comprehensive attempt at curriculum reform was justified In the process of exploring the possibilities, a strategy began to emerge for a comprehensive curriculum design/development project The strategy that evolved was based on the following assumptions Firstly, that for any curriculum reform to be effective, those who are to implement the new curriculum must understand sufficiently clearly what the new design involves, so that they are able to implement it intelligently Secondly, that since most of the members of the staff did not have formal preparation or experience in curriculum development (or in a study of the learning process and pedagogies) that they must *learn their way through* the project Thirdly, that since students learn as a result of the activities they themselves engage in, so would be the case with teachers Fourthly, that curriculum is not a matter simply of form or structure it must also be concerned with substance (what the learner is to give his attention to, what experiences are to be provided which will facilitate his learning, what is to be expected, etc) And finally, that outside resources can effectively be utilized in assisting the permanent staff in coming to grips with its own problems This role for an outsider is explored in some detail by Havelock (1)

CONCEPTUAL BASIS FOR STRATEGY

The strategy that was developed for the five-year project undertaken by the Faculty of Agriculture had its conceptual basis in the curriculum rationale proposed by Tyler (3) Tyler's rationale may be stated in four questions which are posed as a basis for directing inquiry by which more rational decisions can be reached and practices adopted The first deals with determining the objectives (purposes) a faculty (or department or institution) should pursue Tyler suggests three sources of objectives (i) A study of the learners—their interests, needs, abilities and similar characteristics that would provide clues to possible objectives (ii) A study of contemporary society—the opportunities it may provide, the problems it poses, the demands it is likely to make on those who avail themselves of the learning opportunities under consideration (iii) A study of the subject matter—the present level of knowledge in the field(s) likely to provide content, the structure(s) that have

been imposed on existing knowledge, the basic organizing ideas guiding inquiry into fields of concern Since these three sources are likely to produce more objectives than can be realistically pursued in any educational programme, Tyler suggests two screens for reducing objectives to a manageable number One is the philosophy of the institution Certain things, explicitly or implicitly, are taken to be acceptable or desirable concerns, others, however desirable in a broad sense, may not be considered within the domain of the specific institution or segment of it The second screen involves what is known about how learning occurs For example, there are some useful guides as to how much time a learner requires to reach a specified level of proficiency in a given field It is known to take longer to develop a comprehension of an idea than to simply memorize materials related to it and it takes longer to be prepared to use an idea than merely to be able to demonstrate an understanding of it Furthermore, learning is facilitated if the learner has clues as to the relationship between the material he is studying and his notion of what he is preparing to do or to become

The second question of the rationale asks what learning experiences will be provided Some of the same ideas useful in the screen on how learning occurs provide leads as to the type of learning experiences that will most likely facilitate the required learning Inquiries into learning experiences focus on the notion that learning occurs as a result of the activities carried on by the learner (what he gives his attention and efforts to) Consequently, the question becomes what will the learner be doing (since that's what his learning will result from), rather than simply what will the teacher do

The third question asks how the learning experiences will be organized Three criteria guide inquiry related to this question (i) Continuity —how to provide for the learner's continuing use in a progressively expanded, elaborated and increasingly comprehensive manner, of the basic ideas and skills to be learned (ii) Sequence—how experiences to be arranged will provide for the learner's acquiring an initially useful notion of basic ideas and skills and how each experience builds on those that precede Usually this can best be accomplished through a series of sequenced experiences throughout the duration of the course of study (iii) Integration—how experiences are to be provided to facilitate the learner's dealing with the interrelationships that exist between the ideas he works with in one discipline or field of study as compared to the others This criterion relates especially to the use to be made of the

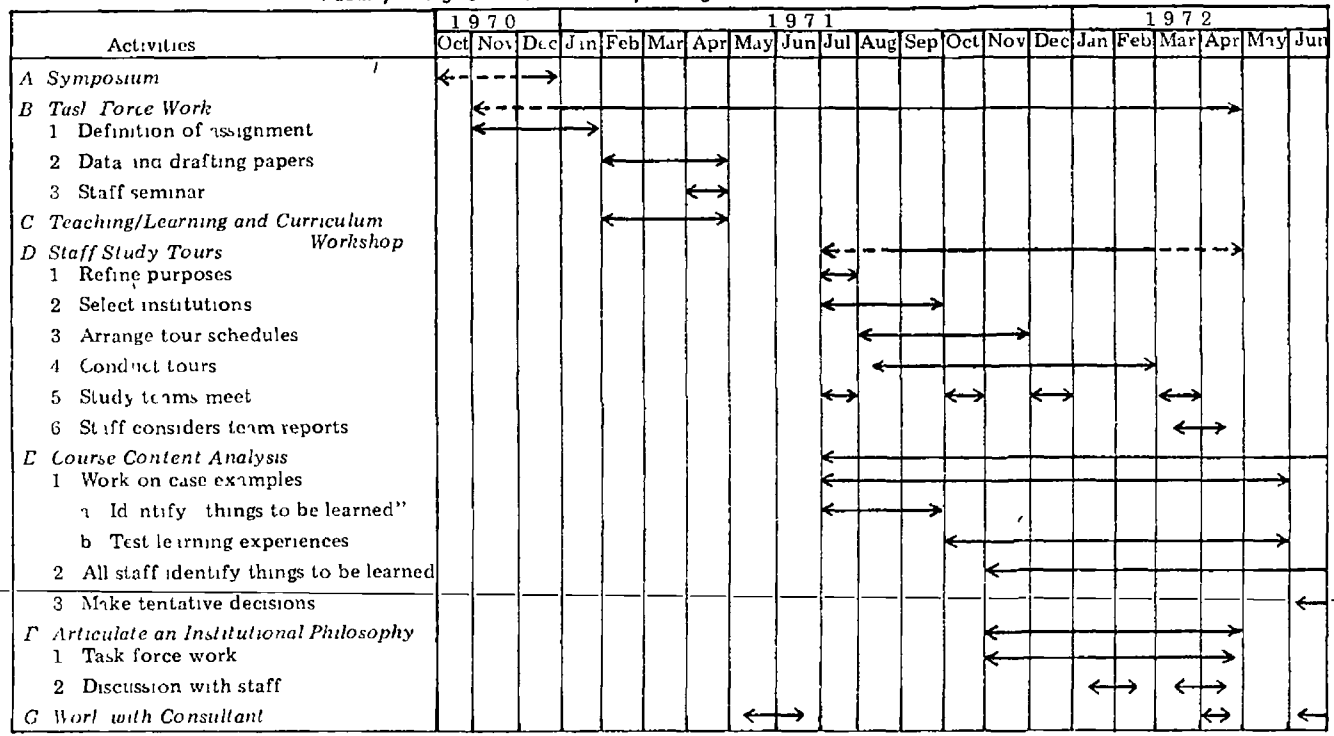
central ideas as he later attempts to deal with problems of the real world

Tyler's fourth question concerns evaluation—the assessment of the consequences of efforts to facilitate learning Typically three broad ideas are involved (i) how to provide useful clues (feedback) to the learner as to how well he's doing, where he's having difficulties, successes, and so on, (ii) how to provide feedback to the teacher (the facilitator) as to how well he's doing—where difficulties are arising, which students can move on, which ones need more attention, etc and (iii) how to arrive at a judgment as to the level of performance of the learner—has he reached a level that can be considered of sufficient merit to signal advancement excellence, etc

THE STRATEGY

Operating from Tyler's rationale as a conceptual base posed a number of demands First, if the observation is correct that most of us are victims (for good or otherwise) of our own experience in education, a number of demands would be made which a staff member schooled in the science of agriculture would not be prepared to meet from his experience as a student of agriculture, or from his experience as a staff member attempting to teach students agricultural science Being a victim of our own experience in education means that we are not likely to have a basis for attempting to teach or to organize a curriculum other than that which we have experienced through observing our own teachers and/or following our intuitive senses This means that we must learn our way through any altered way of thinking about, organizing, implementing, and assessing a curriculum A strategy, devised to provide staff with the opportunity of *learning their way* through a comprehensive project was developed for the curriculum design/development project of the Faculty of Agriculture It was planned to span five years and was divided into five phases I sanctioning the strategy (Autumn, 1970), II background and exploration (1971-72), III decision-making (1972-73), IV implementation (1973-76), V continuing experimentation testing and adjusting Times were anticipated for each phase and activities for each year were spelled out in some detail prior to the beginning of the year Figure 1 will serve to illustrate the details of Phase II In this figure, arrows are intended to indicate the timing for each activity planned for the phase Solid lines represent actual work, broken lines preliminary work required

Figure 1 Phase II (Background/Exploration) Curriculum Design/Development Project
Faculty of Agriculture University College Dublin



In order to operate on the basis of Tyler's curriculum rationale, a number of matters are identifiable which a staff member needs to have some grasp of, or must somehow acquire a grasp of, in order to operate satisfactorily from this conceptual base Concern with objectives, for example, raises several questions (i) What is the nature of educational objectives? (ii) What is there to be observed about society that can provide clues for objectives? How can observations be made that will yield potentially useful results about society? What resources are available for formulating and implementing means of making observations? (iii) What is there to be learned about the learner? How can it be learned? Of all things that might be learned, how does one determine those that are most critical? (iv) What is meant by studying subject-matter or going to subject-matter specialists as a means of identifying potential objectives? (v) How can a philosophy of institution be determined that could be useful in screening potential objectives? (vi) What must be known about the psychology of learnmg so that that knowledge will serve as a useful screen for objectives? (vii) What must be known about how learning occurs in order to be able to identify learning experiences that are likely to achieve specified objectives? (viii) Are there different ways of thinking about how learning experiences can be organized that differ from typical ones most staff members have been exposed to? If so, what are those ways and how can some perspective on them be gained? (ix) How is it possible to evaluate the outcomes of educational efforts directed at specific objectives other than grades made on examinations by students?

Having established objectives, the next problem is one of designing a strategy (set of procedures and activities) that will on the one hand lead to a revision in curriculum and on the other provide the kinds of experiences that will facilitate the acquisition of the understandings required of those who are expected to implement the revised curriculum

The nature of the Tyler rationale is such that it is possible to start with any of his four questions In the present case the concerns being expressed by staff were of such a nature and so far-reaching that it was assumed that starting with a concern for objectives would be as appropriate as any How is it possible to engage a staff of 50 or more in pursuing a search for objectives?

Since the Faculty involved is concerned with contributing to the education of students who aspire to make use of their knowledge in dealing with some problems considered important to society (in other

words, they plan to become professional practitioners), it appears appropriate to establish communication with members of the industry (in this case, the agricultural industry) who employ graduates for such purposes This beginning point was also prompted by the concern of staff to make certain that students were being prepared to undertake the roles expected in the industry

A two day symposium was organized at which representatives of various segments of the agricultural industry were invited to present papers What employers expect of the professional should provide clues as to what will be demanded of the practising professional Staff, students, representatives of the profession and leaders of industry participated and heard papers addressed to four questions What will Irish society be like in the foreseeable future as it may affect demands to be made for and on university graduates in agriculture? What competencies are required of the agriculturally educated professional for your segment of the industry? What contribution can your segment of the industry make to the continuing education of the agricultural graduate once he is in your employment? What contributions to the education of the agricultural professional should the university make?

In addition to the potentially useful clues the symposium itself provided, the questions posed provided bases of further study for five task forces made up of members of staff Virtually the entire staff participated on one or other of the task forces A task force was assigned to each of the following problems (i) What is (and is likely to be in the foreseeable future) the nature of Irish society in relation to agriculture? (ii) What competencies are required of the agricultural professional? (iii) What competencies are required of the agricultural professional that are appropriate concerns of the university? (iv) What career patterns may be anticipated for the agriculturally educated university graduate? (v) What are the characteristics of students in agriculture?

The task force on the nature of Irish society was seeking clues from society that provide insight into possible objectives At the same time it was hoped some insights would be gained into the ways in which scholars who study society (especially sociologists and cultural anthropologists) have formulated means for making systematic observations and into the concepts such scholars have developed to facilitate an understanding of the phenomena they study How others study society can provide useful clues for the agricultural professional Such matters as changing consumer behaviour demands for the products of agri-

culture, degree of affluence, and educational level of a society may all be relevant

The task force concerned with the competencies demanded of the agricultural professional examined the nature of the job of the professional and what he needs to acquire through education or other means This examination was designed to provide some perspective on the nature of the learning task—what it was the student was preparing to become

Competencies required of the professional that are appropriate concerns of the university was an assignment addressed to the initial development of a philosophy of the institution The question was what does the university see as its appropriate role in relation to the preparation of the agricultural professional? The articulation of a philosophy would become one screen by which potential objectives could be sorted

The study group examining anticipated career patterns focused on the one hand on the learner—not on what he is like coming into the university, but on what he can expect once he is out This information provides insights into his needs (recognized or otherwise) which may be appropriate concerns of the university It also provides a dimension on the nature of society not provided by the other inquiries that is, it considers what changing demands are likely to be made upon the professional, what are the different roles he may have an opportunity to assume in the span of a career and what types of opportunity will be available for varied career streams

The task force concerned with the characteristics of students was seeking to find out more about present and potential students (educational and other background aspirations, motivations to learn, how they viewed university education, and the like) Such information can also provide useful clues to the formulation of educational objectives

The five task forces were concerned with two of the three sources of clues to potential objectives and one of the two screens encompassed in Tyler's questions on the objectives to be pursued They did not deal with subject-matter as a clue to possible objectives or with the psychology of learning as a screen One other limitation to the work of the task forces should also be pointed out They were designed to contribute to two broad purposes to seek out clues to possible objectives and to provide staff with opportunities for learning how to conduct such observations and for gaining insights that the actual conduct of such observing can provide With these two purposes in mind it would have

been potentially desirable to have had each member of staff serving on each task force However, to attempt this would have been unrealistic To offset this limitation, staff seminars were organized to hear and discuss reports from the various task forces so that all members of staff could profit vicariously from the direct experience of associates Two such series of seminars were scheduled, the first to deal with preliminary drafts of reports from each task force and a second, with the help of Tyler as a consultant, to assist the staff in interpreting their observations

CONSEQUENCES

The original timetable for the project has not been maintained entirely It has been more difficult to reach a point for making decisions than had been anticipated The original strategy called for background and exploration (Phase II) to be completed in one year Note that Figure 1 extends this phase over two years The first difficulty arose in not being able to arrange study tours during the first year Since that activity was to contribute a substantial background input for decisions it was necessary to extend the calendar time for background and exploration

There were other delaying factors The work of two of the original task forces had not advanced to a point where they could make the critical contribution required One of the task forces was to come up with a definition of competencies required of the professional These competencies would provide one basis for judging what a graduate should know in order to begin functioning as a professional A second of the task forces was to develop and articulate a philosophy of the institution Tyler's rationale calls for a philosophy as one screen for judging what objectives should be pursued in a curriculum The work of neither task force had progressed to a point where its working documents could provide a framework for decisions

A major factor in necessitating an extended period to background and exploration was the discovery that staff members were having to grapple with ideas they had not previously considered For example, they had never attempted to articulate a philosophy for the Faculty, to say nothing of generally agreeing and accepting one to represent their collective positions The staff also had to learn much about how to work together in order to accomplish a collective task The staff represented many different points of view, vested interests and philosophical posi-

tions about the purposes of a Faculty of Agriculture and diverse opinions about what could or could not be done within the constraints of the institution (the university) government funding bodies, and the like

But much has been accomplished There now exists an agreed, even if tentative, statement of philosophy A decision has been reached to arrange for students to have a wider range of choices in what they spend their time studying It has been decided that the amount of staff-student contact time (in terms of hours per week) will be substantially reduced

Through the work of additional task forces, work groups, committees and other mechanisms, decisions on overall structure are in the making Based on benchmark studies conducted by postgraduate students of the Kellogg Agricultural Extension Centre, a task force is approaching a workable definition of competencies required for the professional These studies have been conducted by systematic examination of the work of practising professionals

As anticipated it will be easier to make decisions about matters of structure than of substance The area in which least progress has been made is that of defining things to be learned This is to be expected The entire educational background and experience of members of staff has been that of giving attention to what will be presented to the student not what things are to be learned by the student Staff have focused attention on preparing outlines from which to lecture These outlines seldom, if ever, give a clue to what the student is expected to do, or become able to do, with the materials presented

Staff members who have engaged in intensive efforts in the activity referred to as course content analysis have found the effort a very trying and demanding exercise However those who have invested substantial effort are demonstrating that they can begin to think of their role in helping the student to learn from a perspective different from that previously held

A different approach to the problem of substance is being contemplated An exercise is being organized in which staff will scrutinize examination papers With the help of the project consultant, Ralph W Tyler, the following kinds of questions will be asked about examination questions set by staff What is expected of the student in dealing with this question? What things are required to be learned so that a student can deal with such a question? What assistance is provided the student

during his course to equip him with these things to be learned so that he be able to deal adequately with this question? Where and in what way would you see the student utilizing what this question calls upon him to demonstrate in his subsequent study, or in his professional career?

In addition to pursuing such a line of questioning, the student's answers to questions will be examined to determine the extent to which the student was able to do what was expected, what he was able to call upon in dealing with the questions, and the nature of learning required to perform on the questions as he did Could the student rely entirely on memorization? Or was he required to use information to make judgments? Or was he required to solve problems?

The staff of the Faculty of Agriculture have demonstrated a determination to stick to this very demanding effort and see it through There have been disappointments, setbacks, confusion, frustrations, strong disagreements and differences of opinions Those who appear to have gained most from the exercise so far are those who have devoted most energy attention, and persistence to the task

Throughout the exercise we have tried to keep asking What bases do you have for your opinion? On what do you base that judgment? What is the evidence? The experience? From what philosophical point of view are you speaking?

We are convinced there are no short cuts to curriculum reform Those who are to implement change must be involved in deciding what changes to make The quality of their decisions depends upon the quality of their understanding of curriculum and all its ramifications Those understandings do not accrue to most of us through our typical academic experience As with our students, staff members learn as a result of activities in which they engage their energies and intellects

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